



Capital Region Fishing Alliance

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30 April 2012

Standing Committee on Climate Change, Environment and Water
ACT Legislative Assembly
GPO Box 1020
Canberra ACT 2601

RE: Standing Committee on Climate Change, Environment and Water Inquiry into Current and Potential Ecotourism in the ACT and Region

Dear Secretary,

Please find attached a submission from the Capital Region Fishing Alliance to the above Inquiry. We would welcome the opportunity to discuss our submission further if required.

Yours sincerely

Shane Jasprizza
President

Capital Region Fishing Alliance submission to the Inquiry into Current and Potential Ecotourism in the ACT and Region

Prepared by Shane Jasprizza and Steven Samuels

Introduction and Background

The Capital Region Fishing Alliance (CRFA), formed in 2009, is an Association representing the interests of recreational anglers from Canberra, Queanbeyan and the surrounding area. Our mission is:

“To contribute to the management, conservation and enhancement of fish and fish habitat in the Capital Region”¹

Our 4 key **focus areas**, which form the basis of our activities, are:

1. **Fish** - enhancing stocks of desirable recreational angling species
2. **Habitat** - improving, restoring and enhancing fish habitat
3. **Access** - to quality fishing opportunities
4. **Participation** - promoting and increasing participation in the sport of fishing

CRFA activities are focussed on the ACT, Queanbeyan and immediate surrounding region, encompassing the Murrumbidgee, Molonglo and Queanbeyan River catchments. We have limited the majority of our response to this region which is a subset of the “Australian Capital Region” defined by this Inquiry.

“Ecotourism” can mean different things to different people. The CRFA refers to the definition by Ecotourism Australia:

“Ecotourism refers to ecologically sustainable tourism with a primary focus on experiencing natural areas that fosters environmental and cultural understanding, appreciation and conservation”²

The CRFA considers recreational fishing to be a popular and valuable ecotourism activity. However, through lack of recognition and inadequate government funding, the potential for fishing tourism to be a significant contributor to the ACT economy has not been fully realised. Below we discuss several issues relating to recreational fishing in the ACT which should be considered in the context of the ecotourism inquiry. Several suggestions/ recommendations are put forward which could enhance the value of recreational fishing tourism in the ACT to the benefit of the local economy.

¹ CRFA website, www.crfa.org.au contains further details.

² Ecotourism Australia website, www.ecotourism.org.au.

Trout Fishing

The ACT and Region has a long history with trout fishing as a valued and valuable enterprise. However over the last 20 years trout fishing in the ACT has dwindled to a point where it is neither widely practiced nor valued as an ecotourism opportunity. Across the border in NSW, and more particularly in the Snowy Mountains Region, trout fishing is a valuable and respected recreational activity. A 2001 survey conducted by Dominion Consulting³ established that in the year 2000, 170,000 anglers fished in the Snowy Mountains, with the value of the trout fishery to the Snowy Mountains economy of \$70million and providing over 300 jobs directly and indirectly. This figure would be considerably more today. To the North of the ACT, the Goulburn-Mulwaree Shire have recommenced the stocking of trout into Pejar Dam; a further acknowledgement of the value of recreational fishing and another source of competition for ecotourism expenditure from ACT residents.

In the Canberra and Queanbeyan Region, over 50,000 residents hold a NSW Recreational Fishing Licence⁴. This figure indicates that fishing is the most practiced recreational activity in our region. (This figure was obtained by post code on NSW angling licences and only includes ACT and Queanbeyan post codes. It should be noted that those under 18, Aboriginal persons and those on Government pensions do not require an angling licence, so the actual figure of those who fish will be significantly more than this number). A recent survey by Freshwater Fishing magazine indicated that 66% of those anglers who fished in freshwater in NSW, fished for trout either exclusively or at some time. This makes trout fishing our most popular freshwater species in NSW and the ACT.

Despite the history of trout fishing in the region and the value of the trout fishery to our immediate south, the ACT no longer provides any trout fishing of significance. Each weekend thousands of anglers from the greater Sydney region pass through Canberra en route to the Snowy Mountains in search of trout fishing destinations. Many local anglers also travel to the Snowy Mountains in pursuit of quality trout fishing opportunities. The ACT misses a great opportunity to capture some of this trade as it no longer provides any opportunity for trout anglers. The ACT would benefit if it was to reconsider its policy position on trout and allow trout in waterways currently dominated by carp, redfin and gambusia to see if they can bring some additional ecotourism benefits to the ACT.

The lack of trout fishing opportunities is as much a result of fishing policy as it is with dwindling and degraded waterways. In the 1980's a conscious decision was made to stop stocking trout in all ACT waterways. The upshot of this decision was to hand over all ACT waterways to noxious fish such as carp, redfin and gambusia. Today all ACT waterways contain an abundance of these undesirable species and nothing is being done to eradicate them. The policy of not stocking ACT streams still stands and this policy provides a "free kick" to carp, redfin and gambusia. Ironically, ACT fishing regulations still classify certain streams as "trout waters" and have closed seasons on trout, despite the lack of stocking of trout.

The CRFA is of the opinion that there are a number of opportunities to re-invigorate the ACT as an angling destination of worth for trout without impacting on native fish or existing native fisheries. The cost would be minimal compared to the expected benefits and implementation is as simple as stocking a few waterways with desirable angling species and publicising the results.

³ Survey available at www.dpi.nsw.gov.au/_data/assets/pdf_file/0006/151971/snowy-mountains-survey.pdf

⁴ Figures taken from the 2001 National Recreational and Indigenous Fishing Survey, available at www.daff.gov.au/fisheries/recreational/recfishsurvey

Googong Dam

Googong Dam was once the premier brown trout fishery in NSW. Fish grew to an extremely large size and anglers regularly travelled to this dam to catch a large brown trout. Many of those who came to Googong were from outside the Region; such was the popularity of the dam. Those coming from other places spent money on accommodation, dining and other items in the ACT and Queanbeyan.

In the 1990's the decision was made to stop trout stocking in the dam due to a potential conflict between brown trout and the native Macquarie Perch. However a bigger threat, the English (Redfin) Perch soon populated the dam to plague levels and these Redfin are believed to have contributed to the total loss of Macquarie Perch in Googong. At the same time, falling water levels during drought conditions exacerbated the problems of the diminishing Googong fishery by having adverse impacts on native fish populations. Today, Googong is full of Redfin with a few Murray Cod and Golden Perch, but Macquarie Perch are considered to be extinct from this waterway. There is a small remnant population in the Queanbeyan River above Googong, but these are separated from the lake by a natural barrier at Curleys Falls.

The CRFA believes that it is now time to try to re-introduce brown trout to Googong Dam in an attempt to re-invigorate this once great trout fishery. The current high water levels and plans for future storage levels mean now is the opportune time to re-establish desirable fisheries. It is well known that brown trout will co-exist with redfin perch as both come from the same region of the northern hemisphere and have a biological history of co-existence. Other trout species do not enjoy this evolutionary advantage and the CRFA believes that the reintroduced trout will prey to an extent on redfin perch (however we do not suggest that brown trout will be able to eradicate redfin perch; they are here to stay, but do not need to be the dominant species). Reinstating brown trout and increasing native fish stocking rates would see Googong once again become a renowned "mixed fishery", with all the tourism benefits this would return to the ACT Region.

The CRFA has made various approaches to commence trial stockings of brown trout in Googong Dam to determine if the fishery can be revitalised, but to date the requests have not been actioned. The CRFA believes that a valuable ecotourism opportunity is going begging. Reintroduction of brown trout into Googong will have no effect on any of the native species present. Any trout stocking of Googong would be at nil cost as fish would be provided by NSW Fisheries. All that is required is an agreement by the ACT Government to once again allow the stocking.

Cotter River below Cotter Dam

With the completion of the new Cotter Dam, an opportunity will exist to develop a "tail race trout fishery" in the Cotter River below the dam. This stretch of river was once famous as a trout fishing destination and, in fact, the Cotter River was one of the first rivers in NSW ever to be stocked with trout (circa 1870).

At present, the only fish to be found in this stretch of river in any numbers are exotic species, carp, redfin and gambusia. Native fish are likely to find the water coming from the dam to be too cold for their habitation. The re-introduction of trout could create a worthwhile fishery. Simply to leave this beautiful stretch of river to the likes of carp is a waste.

Suburban Waterways

The ACT has a number of suburban waterways with the potential to support vibrant, successful recreational fisheries. Only five of these waterways are currently stocked with fish, with only native species (golden perch and Murray cod) currently being stocked on a three-year rotational basis. This leaves a vast resource of smaller waterways unstocked. Surveys by the CRFA indicate that many waterways not stocked are currently populated by carp, redfin and gambusia, some within a very short time of them first filling. Some of these suburban waterways have the potential to support trout; nearly all of them will hold native fish. Investing in an expanded stocking program to seed these unstocked waterways will provide significant community benefit and would also allow the ACT to make a claim of being a capital city with suburban fishing unparalleled in Australia.

Stocking of smaller urban waterways has already proven successful. The CRFA in cooperation with the Monaro Acclimatisation Society already stocks a suburban waterway in Queanbeyan. This experiment is now developed into a permanent stocking, such has been its success, and the increase in the use of the waterway has been substantial. Expansion of this programme into the ACT would provide a number of tourism benefits. A member club of the CRFA, the Canberra Fisherman's Club has acknowledged this potential and has recently funded additional stocking of native fish into two small urban ponds in the ACT.

The CRFA recommends an expanded annual stocking regime for currently stocked waterways and further trials and monitoring of stocking smaller waterways to determine optimum species mix and stocking rates to provide the best results.

Urban Water Quality and Fish Habitat

Many of the ACT's urban lakes and ponds are devoid or severely lacking in habitat suitable for native species. To provide the maximum benefit from additional native fish stocking, the CRFA recommends that a program of habitat restoration and enhancement also be undertaken to increase the native fish carrying capacity of these waterways. This would include restoration of riparian habitat which supports the food chain and the addition of suitable in-water habitat such as logs, trees and rocky structures to provide suitable shelter and food sources. The CRFA has recently secured a grant to trial artificial habitat ("reef balls") in an urban pond environment. This is another potential source of suitable fish-supporting habitat.

Poor water quality in many urban waterways in the ACT is also a contributing factor in the decline of native fish species and the increasing dominance of carp, redfin and gambusia. The CRFA recently participated in the Environment Commissioner's *Investigation into the state of the water courses and catchments for Lake Burley Griffin*⁵. While the final report has yet to be tabled, CRFA support the draft recommendations and request that this Inquiry support their implementation. Improving urban water quality is an important factor in the potential success of enhanced fishing ecotourism and community engagement is a key component of this.

⁵ See www.environmentcommissioner.act.gov.au/investigations/lake_burley_griffin_investigation

Murrumbidgee River

The CRFA recognises the unique environmental value of the Murrumbidgee River to the ACT Region. Whilst the CRFA does not advocate for the substantial expansion of recreational fisheries on the Murrumbidgee, there is potential for further development of unique “wilderness fishing” opportunities on the river. This could be facilitated through further habitat restoration and enhancement along with the upgrading and ongoing maintenance of access tracks and facilities. The Murrumbidgee could then be (carefully) marketed as an ecotourism destination with Catch & Release recreational fishing being a key drawcard.

The establishment of the Upper Murrumbidgee Demonstration Reach provides a perfect avenue for enhancing the understanding and appreciation of the river’s ecology and provides the potential for related ecotourism activities. Evidence of the gradual recovery of the degraded section of the Murrumbidgee within the ACT can be seen in the gradual recovery of Trout Cod, with recreational catches of juvenile fish increasing in recent years. The CRFA recommends ongoing government investment in the Demonstration Reach and projects to further rehabilitate the Murrumbidgee River.

Potential Benefits

The CRFA sees a number of benefits of re-establishing targeted trout fishing within the ACT. The cost would be limited to the cost of trout fingerlings for stocking. The cost and number would be dependent on the number of waterways stocked and the density, but it is anticipated that a substantial fishery could be developed for a small cost. This stocking would not include Googong Dam as this waterway is stocked by NSW Fisheries. Brown trout for stocking Googong could come from the NSW stocking programme with no cost to the ACT or Region.

Similarly, the CRFA considers an expanded program of native fish stocking, both in currently stocked waterways and the establishment of additional stocked waterways, combined with a program of habitat enhancement, would greatly increase the ecotourism potential of the ACT.

The required investment to fund such programs would be far outweighed by the returns from increased fishing tourism. The potential benefits include:

- Enhanced opportunities for ACT residents to fish locally without travelling to the Snowy Mountains or other waterways outside the immediate region – money spent at home rather than outside the ACT.
- The ability to develop greater awareness of waterways and how they function as an ecosystem due to the increased activity that additional fishing opportunities would bring.
- Greater environmental stewardship through increased awareness and appreciation of our waterways.
- Potential for entrepreneurs to develop fishing guiding businesses in the ACT.
- Potential for those passing through the ACT to stop longer and have a fish locally.

Recent scientific work undertaken by NSW Fisheries and ACTEW (Cotter Dam project) indicates that of all the introduced fish species, trout are proving to be relatively benign in terms of total impact on the environment and native species. The CRFA is not suggesting a wholesale introduction of trout, but we believe that opportunities exist to stock a limited number of waterways with trout for the benefit of the region. These waterways are currently degraded to a significant degree by other pest species so some realistic trials would not present any environmental issues.

Terms of Reference

a) The extent to which organisations currently deliver ecotourism activities in the Region.

The Australian Capital Region supports a vibrant trout fishery in the Snowy Mountains, serviced by a range of fishing-related businesses. These include boat and fishing equipment sales and hire, as well as a number of fishing guides offering a range of services which would be considered as “ecotourism activities”. There are also a number of guides operating outside of the Snowy Mountains, offering “wilderness fishing” and similar ecotourism opportunities. There are no known guiding services within the ACT, due to the current poor state of the region’s trout fishery and relatively limited native fishing opportunities.

The CRFA and its member clubs promote activities to protect, enhance and restore fisheries and fish habitat in the ACT region. Examples of activities undertaken or promoted to date include:

- fund raising to contribute to stocking of native fish in the ACT urban ponds;
- hosting the Canberra Carp-Out community fishing event and other public events;
- conducting fishing and casting clinics incorporating sustainable fishing education;
- promotion of fishing at various trade shows;
- participation in tree planting and riparian rehabilitation events;
- support and promotion of the Upper Murrumbidgee Demonstration Reach;
- securing grant funding for a) resnagging and revegetating the Queanbeyan River, b) weed control on a section of the Bredbo River near Bredbo township and c) trials of artificial habitat enhancement.

b) The extent to which these organisations’ ecotourism activities demonstrably contribute to, and detract from, conservation and restoration of ecosystems throughout the Region.

Recreational fishing is considered to be a sustainable activity, thanks to fisheries regulations and self-regulation by the vast majority of anglers. No species of fish has been known to be made extinct from recreational fishing or is under threat of extinction from recreational fishing. This is contrary to the views held by certain conservation and animal welfare groups who consider fishing at odds with the notion of conservation. Most recreational anglers consider themselves to be the “true conservationists”, with the future of fishing being dependent on the sustainability of the resource.

The CRFA believes that recreational fishing opportunities within the ACT can be greatly enhanced without increasing the risks to aquatic ecosystems. The CRFA is committed to the ongoing conservation and restoration of aquatic habitats and ecosystems for the benefit of both anglers and the environment. Building awareness and appreciation of ecosystem sustainability is a key conservation initiative of the CRFA.

c) The extent to which these activities contribute to the Region’s economy.

As described above, recreational fishing, for both trout and native species is a valuable contributor to the economy of the broader Australian Capital Region, with trout fishing worth an estimated \$70million to the Snowy Mountains region alone. Successful native fisheries, such as Burrinjuck Dam near Yass, are also significant contributors to regional economies. The ACT is missing out on a greater share of this contribution due to the lack of recognition and funding for recreational fishing in the ACT and the resultant state of local fisheries.

d) The industry self-regulation and government regulation, including, but not limited to, accreditation and licensing, which is most likely to incentivise ecotourism activities that assist in the protection and enhancement of the Region's ecosystems.

The sustainability of recreational fishing is managed through various regulatory means, including:

- **Size limits:** legislated minimum size limits below which fish cannot be kept by anglers. Maximum size limits are also in place for certain species to protect large breeding fish.
- **Bag limits:** maximum quantities of a species that may be kept by an angler in any one day.
- **Closed seasons:** closures during certain times of the year to allow fish to breed unhindered.
- **Closed waters:** for protection of fragile environments, breeding areas or water supplies.
- **Fishing gear restrictions:** prohibiting destructive or indiscriminate fishing methods such as nets and limiting the quantity of fishing gear that can be used.

In addition to these government regulations, many anglers also “self-regulate” to ensure sustainability of the resource. “Catch & Release” fishing is growing in popularity, with more and more anglers choosing not to keep fish caught, or to voluntarily keep less than the allowable bag limits, as appreciation for the natural environment grows. Fishing is increasingly seen as a legitimate means of connecting with, experiencing and enjoying the natural environment.

Anglers fishing in NSW waters are required to purchase a Recreational Fishing License, with license funds being used for enhancing recreational fisheries and funding various recreational fishing programs such as education and compliance. There is currently no fishing license in the ACT. Whilst the CRFA can see the potential benefits, we concede the argument put forward by government that the cost to administer an ACT license makes it unviable. However, the CRFA does not consider the level of education, monitoring and compliance activities to be adequate within the ACT and would like to see additional resources committed to these activities. A dedicated Fisheries Officer should be employed, particularly in the summer months most popular for fishing.

e) The industry and government measures that are most likely to promote understanding of the biodiversity and other benefits of ecotourism organisations explicitly basing their processes and outcomes on principles of ecological sustainability.

In addition to the recommendations for enhancing ACT fisheries, the CRFA recommends that the ACT government actively promote recreational fishing as a healthy, sustainable activity. The CRFA welcomes the opportunity to partner with the government to promote recreational fishing and is open to discussion on this issue.

f) Any other relevant matters.

The CRFA recommends that the discussion presented above in relation to enhancing recreational fishing opportunities in the ACT be considered by the Inquiry. Enhancing recreational fisheries and improving education and awareness of sustainable recreational fisheries will contribute to the increased appreciation of the natural environment.

Summary and Recommendations

The CRFA believes that recreational fishing is under-recognised as a valuable form of ecotourism in the ACT and under-supported/underfunded by the ACT Government. This is demonstrated by the economic value contributed by recreational fishing to regions such as the Snowy Mountains, where investment in recreational fishing is significantly greater by comparison. Properly resourced and supported, recreational fishing has the potential to become a valuable contributor to the ACT and regional economy, while still maintaining environmental sustainability.

The CRFA recommends that:

1. the ACT government recognises the value of recreational fishing and the potential for enhancing ecotourism opportunities in the ACT.
2. the ACT government reinstate the stocking of trout in ACT's waterways.
3. a recommencement of stocking of brown trout in Googong Dam be approved.
4. investment in existing stocking of native fish species be increased in currently-stocked ponds and extended to additional urban ponds.
5. a "tail race trout fishery" be re-established below the new Cotter Dam spillway.
6. a program of restoration and enhancement of fish habitat in urban ponds be funded and implemented.
7. The Inquiry note and endorse the recommendations of the Investigation into Lake Burley Griffin water quality.
8. additional resources be committed to fisheries education, monitoring and compliance activities in the ACT.
9. the ACT Government commits to long-term funding of the Upper Murrumbidgee Demonstration Reach and programs to continue the rehabilitation of the Murrumbidgee River and the recovery of its native fish populations.

An Economic Survey of the Snowy Mountains Recreational Trout Fishery



**A Report to the Recreational Trust Fund,
NSW Fisheries**

**By
Dominion Consulting Pty Ltd**

February 2001

FINAL REPORT

An Economic Survey of the Snowy Mountains Recreational Trout Fishery

By Dominion Consulting Pty Ltd

February, 2001

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Executive Summary

A study was conducted to determine the economic expenditure of recreational fishing in the Snowy Mountains region of New South Wales. The study method involved the use of three independent surveys to obtain reliable estimates of expenditure by recreational anglers.

Prior to the commencement of this study, the first survey of holders of the NSW Recreational Fishing Licence (RFL) was conducted in order to gather data on the demographics, behaviour, preferences and characteristics of freshwater anglers who fish in New South Wales.

The three surveys designed to measure economic activity due to recreational fishing in the Snowy Mountains region were:

- A stratified random telephone survey of holders of the NSW Recreational Fishing Licence;
- A face to face survey of actively fishing anglers in the Snowy Mountain Region; and
- A survey of businesses within the Snowy Mountain Region for which recreational fishing is a significant component of their turnover.

Results of the overall RFL survey indicated that:

- Up to 170,000 freshwater anglers fished in New South Wales, on 1.9 million days during 1998/99;
- Of this estimate, 137,000 anglers holding the Recreational Fishing Licence (RFL) fished for over 1.5 million days;
- Of total RFL holders, approximately 32%, or 43,000 to 54,000 resided in Victoria;
- Freshwater fishing is a state wide activity among NSW/ACT residents. High rates of freshwater angling participation are by residents of ACT and Southern NSW representing 42% of NSW freshwater licence holders. This shows the influence of the rivers and Snowy region in the South of the state. The West of the state has 14% of all freshwater recreational licence holders and Sydney 18%;
- Freshwater anglers preferred to fish in streams and rivers and preferred to fish for native species of fish (57% of all anglers) compared with 31% who preferred to fish for trout;
- Between 42,500 and 53,000 anglers fished for trout in New South Wales during 1998/99, of which, 64% fished in the south of the State (including primarily the Snowy Mountains area);

In summary the state wide survey confirmed the popularity and diversity of freshwater fishing in NSW and showed the Snowy Mountains to be the most significant trout fishery in NSW.

Results of the expenditure surveys indicated that:

- An estimated 33,800 visiting anglers fished within the Snowy Mountains region in the preceding 12 months;
- While anglers only represent 1-4% of total visitors to the Snowy region, they contribute 2% of day visits, up to 15% of overnight stays and approximately 14% of all visitor expenditure in the region;
- Of those fishers in the Snowy, 20-22% came from Victoria and 14-27% came from the ACT to fish;
- It was estimated that 11.3 to 14.7 days per person was spent fishing in the area in the past year, or between 386,000 and 500,000 days in total;
- The main areas of expenditure in the Snowy region, due to recreational fishing, were food and drink, accommodation, travel and items directly associated with fishing;
- For items directly related to fishing, the main expenditures were on fishing tackle, boat fuel, fishing clothing and bait;
- At least \$46.5 million was spent within the Snowy Mountains area by visiting anglers during trout fishing trips. This translates to between 450 and 700 jobs associated with trout fishing expenditure in the area. These estimates are considered to be conservative since they did not include capital items such as lodges, on-site caravans, boats, trailers, outboard motors or vehicles which may have been purchased for sole, or partial use for recreational fishing in the region. Neither did the estimates include trout fishing expenditure by residents of the Snowy Mountain region;
- Taking into account all expenditure attributable to fishing in the Snowy Mountains region (including capital items, expenditure by local residents and expenditure outside the region), it is likely that up to \$70 million is spent on the fishery per annum;

The results of this study indicate the economic importance of the trout fishery to the Snowy Mountain community and illustrate the benefits in maintaining fishing related expenditure in the region. There are also opportunities to enhance the trout fishery expenditure to the benefit of the Snowy region.

Background

In January 2000 Dominion Consulting Pty Ltd and Pepperell Research and Consulting Pty Ltd were engaged to undertake an economic survey of the recreational trout fishery in the Snowy mountain area of NSW.

The project has three core elements:

i) *The face to face fishing interviews in the Snowy region*

During the year 2000 recreational fishers in the Snowy Mountain trout fishery have been surveyed on site as they fished or as they were returning from a fishing trip.

ii) *A survey of freshwater recreational fishing from licence records*

The 1% sample of 1340 licence holders where telephoned by a professional market research company, Quadrant Research Services Pty Ltd and asked questions about their recreational fishing activity. Trout fishers in the Snowy Mountain area were identified and asked questions on their fishing trips expenditure.

iii) *An economic survey of businesses in the Snowy Mountain Trout fishery.*

The business survey was to estimate the expenditure associated with the recreational trout fishery in the Snowy Mountains region.

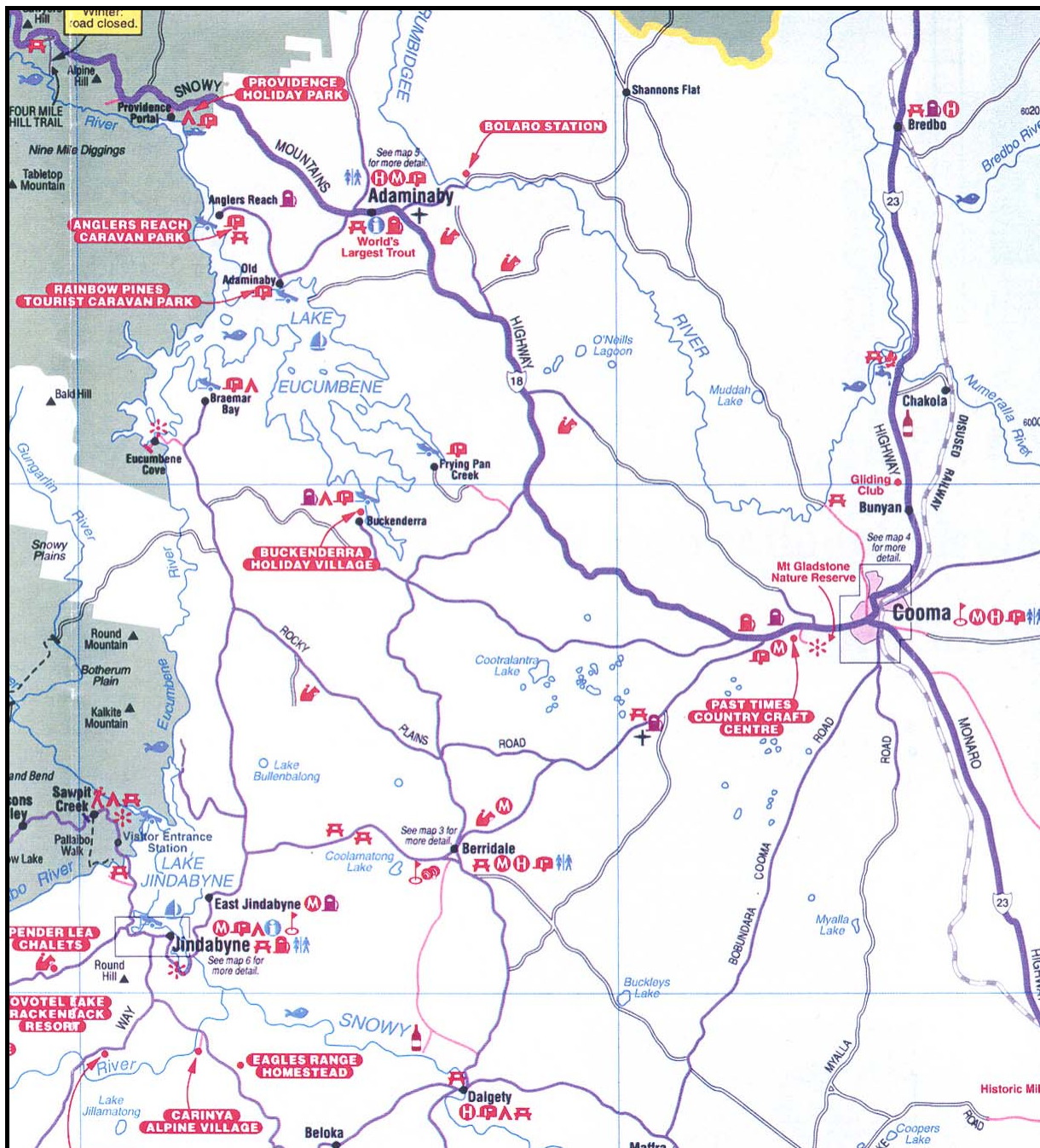
This report is divided into two sections: Part A and Part B.

The results of the telephone survey of recreational licence holders is reported in Part A giving a state wide overview of the location of recreational fishing licence holders who purchased licences in the first year of the licence, 1998-99. A 1% sample of 1340 licence holders where telephoned by a professional market research company, Quadrant Research Services Pty Ltd and asked questions about their recreational fishing activity. This enabled a picture of different recreational fishing activities across freshwater fisheries in NSW to be obtained. The survey also identified the activity of fishers in trout fishing across the state and in the Snowy mountain fishery in particular.

Part B of this report reports the results of telephone and field surveys of the expenditure associated with trout fishers in the Snowy Mountains fishery. These expenditure estimates are compared with the results of the business survey to give a fuller picture of the economic importance of the recreational trout fishery in the Snowy Mountains.

Some businesses cater directly for recreational fishers and others focus on other tourism sectors. The survey sought to confirm the expenditures reported by anglers with the businesses associated with trout fishing in the Snowy Mountains region.

The survey target area was South & East from Providence Portal, extended to Dalgety in the south, and to Cooma in the East. This includes the major trout fishing areas of the Snowy Mountains Region (see map below).

Background Figure: A map of the Snowy Mountain study region.

Part A:
The NSW Recreational Fishing
Licence Survey

Part A: The NSW Recreational Fishing Licence Survey

1. Management Information from the Recreational Fishing Licence Records

In July 1998 the freshwater recreational fishing licence was introduced and records were kept of all licence sales. In this section we describe the information that can be gained for freshwater fishery management in NSW from the analysis of a sample of data records.

With the assistance of NSW Fisheries a sample of 1370 NSW Recreational fisheries licence (RFL) holders were extracted from the licence records held by NSW fisheries for the year 1998-99, the first year of the RFL. In the first year a total of 137,000 licences were sold. Thus the sample was approximately 1% of the total licence population. The licences were sold through different agents as reported in Table 1.

Table 1: Sales of the NSW RFL by areas and duration of licence in the 1998-99 year.

Area	Postcode	3 year	1 year	1 month	Total
SYDNEY	2000	308	1,046	560	1,914
SYDNEY	2100	312	2,079	904	3,295
SYDNEY	2200	159	1,153	809	2,121
NEW ENGLAND	2300	662	9,989	4,836	15,487
NORTH COAST	2400	236	2,413	1,196	3,845
GOULBORN/YOUNG	2500	495	4,579	2,726	7,800
CANBERRA/SNOWY	2600	2,481	18,702	14,060	35,243
TUMUT ETC	2700	1,043	10,718	6,178	17,939
BATHURST/DUBBO	2800	451	5,579	3,941	9,971
TUGGERANONG	2900	112	793	431	1,336
MELBOURNE	3000	48	616	612	1,276
MELBOURNE	3100	24	409	628	1,061
MELBOURNE	3200	1	46	129	176
MELBOURNE	3300	25	603	934	1,562
MILDURA	3400	129	1,858	1,361	3,348
MILDURA/EUCHUCA	3500	884	10,475	6,107	17,466
N.VICT	3600	235	5,366	2,271	7,872
N.VICT	3700	70	1,597	1,856	3,523
QLD	4000	14	212	166	392
SAUST	5000	28	596	1,123	1,747
Totals		7,717	78,829	50,828	137,649
Percentages		5.6%	57.3%	36.9%	100.0%

The RFL records were validated and interrogated to give an overview of licence record holders. The sample was then telephone surveyed by an independent Market Research company and the results reported in section two of this report.

The RFL Sample

The fishers bought their licences in the period 1st July 1998 to 30 June 1999 and were selected on a random basis, being stratified by agent. A 1% sample of licences sold by each agent was taken for the 1998-99 licensing year. Where more than one licence was selected per agent, these licences were selected from separate times of the year.

The validity of the sample data was tested against the sales frequencies of RFL sales by differing duration (3 year, 1 year and 1 month sales of licences see Table 2a). The comparison shows that the statistical variation falls well within acceptable limits, as reported below in Table 2b.

Table 2a: Descriptive statistics for RFL Sample by postcode region and duration of licence sale

State	Fisher Postcode Region	Duration of Licence			Grand Total
		1 month	1 year	3 year	
NT	Darwin	2			2
NT Total		2			2
QLD	Rockhampton	1			1
	Townsville	2			2
	Sunshine C.	1			1
	Toowoomba	3	1		4
	Goldcoast	3	1		4
	Brisbane	2	2		4
QLD Total		12	4		16
NSW & ACT	N Coast NSW	10	20	2	32
	New England	25	78	3	106
	Western NSW	41	68	13	122
	Hunter & C. Coast NSW	30	32	1	63
	Sydney	63	78	18	159
	S Coast NSW	17	14	5	36
	ACT	53	101	11	165
	Southern NSW	41	143	17	201
NSW & ACT Total		280	534	70	884
SA	Far Country - SA	14	5		19
	Near Country - SA	7	2		9
	Adelaide Subs	9	2		11
SA Total		30	9		39
VIC	Ballarat	21	25		46
	Bendigo	30	95	14	139
	Geelong	13	2		15
	Gippsland	12	3		15
	Melbourne	67	52	2	121
	Seymour	24	63	4	91
VIC Total		167	240	20	427
WA	North West - WA	1			1
	NE Subs - WA		1		1
WA Total		1	1		2
Grand Total		492	788	90	1370

Table 2b: Descriptive statistics for total population and survey sample by duration of licence.

	1 month	1 year	3 year
Sample Tots (%)	35.9%	57.5%	6.6%
RFL Total Sales (%)	36.8%	57.5%	5.7%
Variance:	-0.89%	0.02%	0.87%

The sample data is proposed to be a representative sample of NSW freshwater licensed fishers. The records include the agent the licence was purchased from, the date of purchase, duration of licence chosen, and the name & location details of the licence holder. This enables basic management information to be developed on the freshwater recreational fishers of NSW.

Investigation of the RFL sample

i) Where do most RFL holders in NSW come from?

Table 3 reports the distribution of RFL holders residential addresses can be analysed by state of origin.

Table 3: The state of origin of NSW RFL holders

State	Total	
NSW & ACT	879	64.2%
VIC	432	31.5%
SA	39	2.8%
QLD	16	1.2%
NT	2	0.1%
WA	2	0.1%
Total	1370	100.0%

Table 3 reports that NSW residents represent 60% of total licence holders, and that Victorians represents 32%. Other states represent 8%. There are a significant number of inter state freshwater anglers fishing in NSW, particularly from Victoria.

ii) Where do NSW freshwater recreational licensed fishers reside?

The distribution of NSW RFL holders residential addresses can be displayed by postcode region for both NSW and Victoria. Table 4a reports RFL holders by state and by Postcode region, sorted by the number of RFL holders per region (see appendix 1 for details of the composition of regions).

Table 4a: NSW RFL holders residential addresses by postcode for NSW

NSW Postcode Region	License Holders	
N Coast NSW	32	3.6%
Western NSW	122	13.8%
New England	106	12.0%
Hunter & C. Coast NSW	63	7.1%
Sydney	159	18.0%
S Coast NSW	36	4.1%
ACT	165	18.7%
Southern NSW	201	22.7%
Total	884	100%

In NSW there appear to be more freshwater RFL holders in the south of NSW and the ACT (42%), than north of Sydney (26%), with 14% in the West and 18% in Sydney region. Below, an attempt has been made to correlate residential information on RFL holders with general population data from the 1996 ABS survey. As the boundaries did not match exactly these figures are illustrative only. These are reported in Table 4b.

Table 4b: NSW population estimates and percentages of recreational fishing licence holders in NSW.

NSW Regions	Regional Population (from ABS 1996, 15yrs plus)		NSW License Holders %
North Coast NSW	389,869	7.0%	3.6%
North & West	414,136	7.4%	25.8%
Sydney	3,364,095	60.1%	18.0%
Hunter & Central Coast	474,917	8.5%	7.1%
South	950,780	17.0%	45.5%
Total	5,593,797	100.0%	100.0%

In comparison to state wide general population estimates the following features are apparent from Table 4b:

- the West and South of NSW have a high RFL holder rate per capita.
- The RFL holder rate per capita in Sydney is low.

The freshwater RFL information implies that freshwater fishing anglers are more rurally based than may be expected from general demography. It is notable that the South and North & West regions have significantly more licensed freshwater fishers than other regions.

iii) Where do fishers buy their licences?

The sales of licences through agent returns have already been described. The licence purchase habits of fishers in relation to their home address can be derived by comparing postcode differences between home address and sales agent. This is reported in Table 5.

Table 5a: Postcode difference between residence postcode and postcode of licence purchase agent.

Variance of agent & residential postcode	No. of Fishers	
Same	549	40.1%
1 to 10	255	18.6%
11 to 100	188	13.7%
101 to 1000	298	21.8%
1001 to 2000	60	4.4%
2001 to 3000	18	1.3%
3001 to 4000	2	0.1%
Total	1370	100.0%

The first 2 rows in Table 5a indicate that most people (59%) purchase their licence near home and probably not on a trip. 72% of people purchase licences within a postcode difference of 100. There is increase in frequency in the data at a post code difference of 101 to 1000 which may correlate with the most common angling trip distance. Larger postcode differences are due to movements interstate, presumably by visitors who choose not to buy a NSW licence in their state of origin.

Table 5b: Postcode difference between residence postcode and postcode of licence purchase agent for three licence durations.

	Duration of Licence							
PC Diff Step	1M		1Y		3Y		Grand Total	
0	134	27.2%	376	47.7%	39	43.3%	549	40.1%
10	79	16.1%	153	19.4%	23	25.6%	255	18.6%
100	78	15.9%	94	11.9%	16	17.8%	188	13.7%
1000	150	30.5%	136	17.3%	12	13.3%	298	21.8%
2000	33	6.7%	27	3.4%		0.0%	60	4.4%
3000	17	3.5%	1	0.1%		0.0%	18	1.3%
4000	1	0.2%	1	0.1%		0.0%	2	0.1%
Grand Total	492	100%	788	100%	90	100%	1370	100%

The results indicate that:

- more 1 month licences are bought on a trip, and less are bought at home than one year licences;
- 3 year licences are predominantly bought by people while at home;
- 1 year licences appear to be bought at home and also on a trip.

iv) Are NSW recreational licence holders predominantly male?

The percentage of licence holders by sex is reported in Table 6.

Table 6: The percentage of licence holders by sex for different licence durations

	1M	1Y	3Y	Grand Total
Male	86.9%	87.9%	92.2%	87.8%
Female	13.1%	12.1%	7.8%	12.2%

It can be seen that NSW recreational licence holders are predominantly male with only 12% of licence holders being female. Females buy proportionately less three year licences.

Summary

The 1% sample of licence holders has revealed some interesting statistics for managers of the NSW freshwater recreational fishery.

- **The proportionate recreational fishing licence holding is higher in some rural areas of NSW, particularly south and west, than in city areas such as Sydney.**
- **The percentage of Victorians buying the NSW RFL is 32% and they may represent a significant management issue.**
- **Approximately 70% recreational licence holders buy their licences close to their residential address and up to 30% on angling trips.**
- **Approximately 88% of RFL holders are male.**

These features represent significant information for the management of the freshwater recreational fisheries in NSW. This information will be verified and augmented by the information received from the telephone survey of recreational fishing licence holders presented in the next section.

Recommendation: The activity and preferences of the fishers from other states, particularly Victoria and their fishing preferences in NSW requires further investigation.

2. NSW Recreational Fishing Licence Survey

This section reports the development and results of a telephone survey of 1340 NSW Recreational Fishing Licence holders conducted by Quadrant Research Pty Ltd in May and June 2000 (Quadrant, 2000). These fishers purchased their licences in the period 1st July 1998 to 30 June 1999 and were selected on a random basis by agent. The sample has been investigated and described in the previous section.

The results of the survey are at two levels detailing freshwater fishing activity for freshwater angling statewide, including trout fishing, and secondly reviewing trout fishing activity in the Snowy mountain area. This information will later interface with the results of the economic survey which will be presented later in 2000.

The Freshwater RFL Survey

A survey instrument suitable for interviewing RFL holders was developed with the scope of the total project and with reference to established questions asked in previous recreational fishing surveys.

The survey is attached in Appendix 2.

It has several sections:

Questions 1-3: Fishing activity

Questions 4-6: Trout fishing and demographics

Questions 7-11: Trout fishing in the Snowy mountains region

Questions 12-14: Trip expenditure in Snowy mountains trout fishery (results in next report)

Questions 15-18: Agent, State and licence duration.

It was decided that a market research company with experience in recreational fishing surveys should be engaged to execute the telephone survey. Quadrant Research Services Pty Ltd was engaged due to its previous involvement in several recreational fishing surveys in NSW.

A total of 1,370 RFL records were available from Departmental records. The telephone survey would contact and identify the holder of the licence purchased in the 1998-99 year. All available licence holders would be asked questions on their freshwater recreational fishing activity and then on their fishing activity in the Snowy Mountain trout fishery.

The response to the telephone survey was less than expected. A total of 712 fishers were contacted out of the 1% sample of 1340¹ names and telephone numbers from the recreational

¹ There were approximately 30 (1,370 less 1,340) data transcription errors.

licence data base. This was a 52% response rate. Quadrant Research Services corresponded with us on discovering that responses from the sample of licences holders were less than expected.

The reasons for a lower than expected response were analysed by Quadrant and are reported in Table 7 below (Quadrant, 2000).

Table 7: Analysis of telephone interview results.

Interview result	Nos	%
Interview	714	52.9%
Refused	122	9.0%
Not a fisherman/Never had	134	9.9%
Termination	11	0.8%
Non-English speaking	3	0.2%
<i>sub total</i>	<i>984</i>	<i>72.9%</i>
No Answer	49	3.6%
Dead Number	203	15.0%
Engaged	21	1.6%
Answering Machine	30	2.2%
Fax	11	0.8%
Call Back	51	3.8%
<i>sub total</i>	<i>365</i>	<i>27.1%</i>
TOTAL	1349	100.0%

From Table 7 it can be seen that 53% of those contacted were interviewed. A further 20% of those contacted either refused to participate (9%), “were not a fisher/never had a licence/No longer lives here” (9%) and termination² of interview/non English speaking (1%).

The balance of 27.1% of names were uncontactable due to technical reasons of which dead numbers were the prime reason (15%). Up to 7 attempts were made by Quadrant telephone interviewers to reach the uncontactable numbers.

Discussion

This is the first use of the freshwater recreational fishing licence data since its inception in July 1998. The passage of time may need to be considered in our discussion as Table 7 indicates that 27% of non responses are contact problems and that a further 20% were issues in cooperation with the survey. These lines are blurred by the possibility of a significant number of telephone numbers in the survey being inaccurate. This could either be erroneous information or deliberate supply of false information by those filling in the licence or carelessness in filling in the information. In further analysis of the data by duration categories of the licence not reported, there was no discernable difference in responses between licence categories ie the short one month licence was no less poorly filled out/ falsified, than the three year licence.

The survey and management implication of this result are on going. The study has an immediate issue of the representative nature of the person interviewed. This is addressed

² Refused - would not be interviewed; termination – stopped during interview; call back – inconvenient on first call, but not available on second; dead number – Telstra “not connected” message.

below. There is also the issue of using data that is more than 12 months old, though the 1998-99 period was chosen as it was a complete year of results and the 1999-2000 was incomplete which may have introduced bias if it had been used. The 1998-99 year is the first year of data and in most data systems the quality of the data improves as people accept the system and work to improve accuracy. These are on-going issues for management and is worthy of further investigation of the integrity of the data before it would be entered in its entirety, or in part, for management purposes. These problems may stem from privacy issues, frustration at having to fill in a detailed form, or data entry errors – either at point of sale (writing on to licence form by business employee) or in the NSW Fisheries office. It should also be recognised this was the first year of data collection. Experience with the commercial logbook system suggests that the standard improves as time goes on providing accurate information is requested.

The sample validity of the Quadrant respondents was tested against known characteristics of the parent data for the RFL sales by licence duration and by sex. The comparison shows that less of the survey respondents were 1 month licence sales. Table 8 reports the results.

Table 8: Comparison between frequency of licence sales for RFL 1% sample and those respondents to the Quadrant sample by licence duration and sex.

	1 month	1 year	3 year
RFL Sales (%)	36.8%	57.5%	5.7%
Quadrant %	27.0%	64.0%	9.0%

	Male	Female
Quadrant (%)	87	13
1% Sample (%)	87.8	12.2

It is proposed that the survey respondents are representative of the 1% RFL sample and hence the fishing population of NSW.

Survey results

The survey respondents

Some basic demographics of the fishers interviewed are reported in Table 9.

Table 9: Results from the question : “What age group do you fall into?”

Age	18-24	25-39	40-59	60+
Quadrant	47	253	347	65
Quadrant %	6.6%	35.5%	48.7%	9.1%

Most licence holders (nearly 85%) are between 25 and 60 years of age. Those over 60 years old were 9% of the sample and were paying fishers as opposed to pensioner concession holders who are exempt.

Those telephoned were 87% male and 13% female. By state of origin: 60% were from NSW, 5% from ACT, 32% from Victoria and 4% from “other states”.

Fishing activity by NSW Freshwater Recreational Fishing Licence Holders

After a brief introduction from the interviewer, respondents were asked a series of questions about their previous 12 months fishing, the results from which can be seen in the following tables.

Question 1: Days spent fishing in NSW in the last 12 Months

Q1a “Thinking about your recreational fishing in NSW in the last 12 months, on about how many days have you fished in the last 12 months in total?”

Q1 b “Thinking about your recreational fishing in NSW in the last 12 months, on about how many days have you fished in the last 12 months in freshwater?”

The mean number of days fished by NSW RFL holders in NSW over the last 12 months was 13.9 days, while the mean number of days fished in Freshwater over the same period in NSW was 11.4 days.

Figure 1 reports the frequency of RFL holders fishing in marine and freshwater among the survey sample of 712 RFL holders. Results show that 211 anglers went saltwater fishing, whereas 599 went freshwater fishing. (501 SW and 133 FW anglers had no saltwater or freshwater fishing activity).

Figure 1: The frequency of freshwater and marine fishing days among the RFL holder sample.

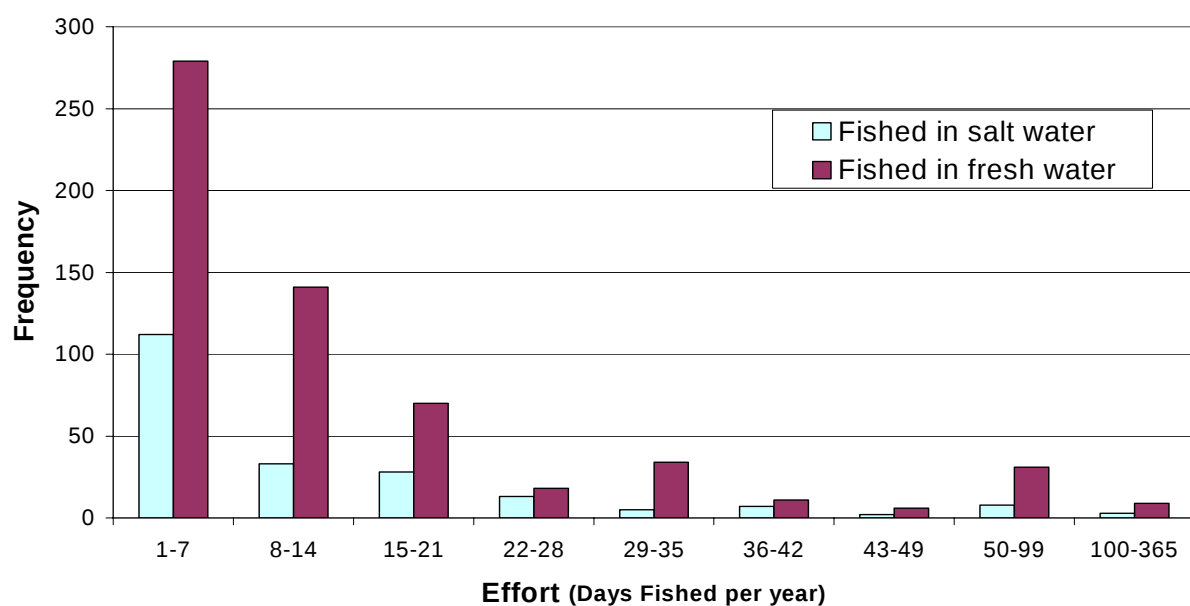


Figure 1 confirms previous surveys that 38% of freshwater anglers fish less than 7 days per year and 50% fish 10 days or under (not including 16% who apparently fish no days per annum). Only 5% of fisher fish more than 50 days a year in freshwater. Figure 2 below illustrates the difference in the total days fished between the marine and freshwater fishing sample.

Figure 2: Comparison of total days fished by sampled anglers in freshwater and marine fishing by NSW RFL holders in the last 12 months.

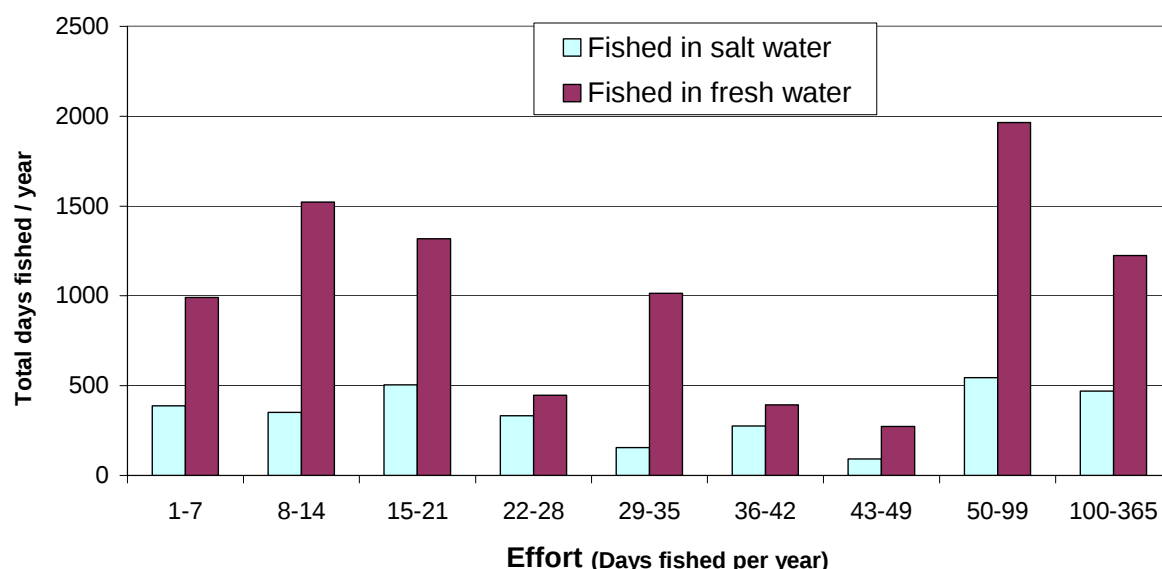


Figure 2 illustrates the avidity of freshwater anglers with 58% of days fished in the survey sample being by anglers fishing more than 21 days per year.

Question 2: Preferred fishing location

Q2 “Thinking about your freshwater fishing in NSW in the last 12 months, on about how many days have you fished in Small dams/impoundments? Large Lakes? rivers/streams? Other (specify)?”

Different preferences for freshwater fishing locations are reported in Tables 10a and b. In Table 10a it is reported that 60% of days fished are in Rivers and Streams, with Dams and Lakes being equally popular at 20% each. However people also fish combinations of locations as reported in table 10b.

Table 10a: Days fished in different fishing locations

Where Fished	Days Fished	
Dams	1846	19.4%
Lakes	1919	20.2%
Rivers and Streams	5605	59.0%
Other	138	1.5%
Total	9508	100.0%

Table 10b: Fishing frequencies in different fishing locations.

	No. of Fishers		Effort (Days)					Mean
			Dams	Lakes	Streams	Total		
Dams Only	53	8.9%	476	0	0	476	5%	9.0
Lakes only	77	12.9%	0	751	0	751	8%	9.8
Rivers and Streams only	275	46.0%	0	0	3337	3337	36%	12.1
Dams and Lakes	18	3.0%	122	137	0	259	3%	14.4
Dams and Streams	68	11.4%	692	0	688	1380	15%	20.3
Lakes and Streams	60	10.0%	0	649	849	1498	16%	25.0
Dams, Lakes and Streams	47	7.9%	556	382	731	1669	18%	35.5
Total	598	100.0%	1846	1919	5605	9370	100%	15.7

The Table illustrates the different fishing behaviour by fishers and of fishing effort. By numbers of fishes 68% fish only in one location, but generate 49% of the total effort. This means that 51% of effort is delivered by 32% of the fishers by number in several different locations. Multiple location anglers appear to be more avid than the one location fishers.

Streams and rivers have the majority of fishers and effort. Much of the attention of fisheries management is towards trout in large lakes. This profile of activity indicates that management effort is also needed in river and stream fishing. This will be investigated below.

Question 3: Preferred types of fish

Q3 “Thinking about your freshwater fishing in NSW in the last 12 months, on about how many days have you fished for

Coastal native fish (eg Bass)?

Inland native fish (eg Murray Cod, Golden Perch)?

Trout?”

The responses by average of days fished are reported in Table 11a.

Table 11a: Preferred Types of fish by RFL holders by average days fished.

	Average Days	%
Coastal Native Fish	1.7	12%
Inland Native Fish	8.4	57%
Trout	4.5	31%
Total	14.6	100%

Table 11a indicates the popularity of inland native fish such as Murray Cod and Golden Perch. Table 11b reports inland native fish constitute 54% of days fished while trout are 29%.

Table 11b: Preferred types of fishing by RFL holders by number of fishers and total days fished.

Types Fished for	No. of Fishers*		Effort (days/year)		Mean
Coastal	99	12%	1,106	11%	11.2
Inland	411	51%	5,452	54%	13.3
Trout	240	30%	2,962	29%	12.3
Other	62	8%	666	7%	10.7
Sum	812	100%	10,186	100%	12.5

* Total number of fishers in sample is 582. Some fishers fish for more than one type of fish making the number of fishers in column 2 is higher than 582. For more detail see table 11c below.

Table 11c: Specific segments in types of fishing preferred by RFL holders by number of fishers and total days fished.

Types Fished for	No. of Fishers		Effort (days/year)		Mean
Coastal only	20	3%	167	2%	8.4
Inland only	286	49%	3715	39%	13.0
Trout only	130	22%	1297	14%	10.0
Inland & Trout	67	12%	2081	22%	31.1
Coastal & Trout	21	4%	428	4%	20.4
Coastal & Inland	36	6%	850	9%	23.6
Coastal, Inland & Trout	22	4%	982	10%	44.6
Total	582	100%	9520	100%	16.4

Table 11c confirms the preference for inland native fish and trout both as a single fishing experience and as a joint activity (22% of total effort). Coastal native fishing is less popular, but has interactions with both trout and inland native fishing activity. About 4% of anglers fish in all three segments contributing 10% of effort. These more avid anglers fish a mean of 44 days per year when the average is 16 days.

In summary trout fishing is the second most popular fishing segment to inland native fish. The survey now focuses on trout fishing.

Question 4: Trout Fishing in Lakes & Rivers

Following question 3, the sample of trout fishers was focused on due to the purpose of the study which is to examine the Snowy mountain trout fishery.

The telephone survey responses indicated a total of 240 of the 712 NSW RFL holders were trout fishers. This equates to 34%. They were asked the following question.

Q4i "Thinking about your freshwater fishing in NSW in the last 12 months, on about how many days have you fished for trout in Northern NSW? (Central and South)"

Table 12a, b and c reports the regional preferences for the state's trout fishers. The south of the state has the greatest trout fishing activity, exceeding the central area and the north (Table 12 a and b). The south has 59% of the days fished for trout in NSW while the central area has 27% and the North 7% (Table 12b).

Table 12a: Average days trout fishing by anglers in different regions of NSW.

	Average Days	%
Northern NSW	0.9	9%
Central NSW	2.9	27%
Southern NSW	6.8	64%
Total	10.6	100%

Table 12b: Total days trout fishing by anglers in different regions of NSW.

Trout Fishing	No. of Fishers*		Effort (days fished)		Mean
Northern NSW	27	10%	213	7%	7.9
Central NSW	69	25%	809	27%	11.7
Southern NSW	163	59%	1756	59%	10.8
Unspecified	19	7%	220	7%	11.6
Sum	278	100%	2998	100%	10.8

* Total number of fishers in sample is 240. Some fishers fish for more than one type of fish. This is why the sum of the number of fishers in column 2 is higher than 240. For more detail see table 12c below.

Table 12c: Days spent trout fishing in specific regions of NSW

	No. of Fishers		Effort (days/year)		Mean
North only	15	6%	110	4%	7.3
North + Central	3	1%	40	1%	13.3
North + Central + South	7	3%	480	16%	68.6
North + South	2	1%	35	1%	17.5
Central only	40	17%	463	15%	11.6
Central + South	19	8%	378	13%	19.9
South only	135	56%	1272	42%	9.4
Trout (unspecified)	19	8%	220	7%	11.6
Total	240	100%	2998	100%	

In Table 12c the fishers fishing the south alone represent 56% of fishers, but 42% of total trout days fished. This illustrates the short term nature of much of the fishing in the Snowy mountain area with an average of 9.4 days per year among anglers specifically fishing in the south alone. A small group of trout fishers (3%) are avid anglers, produce 16% of total trout fishing effort and fish all three areas in NSW for a total of 68 days per year.

Question 10: Mode of fishing

This question was directed only to the 163 fishers who did fishing trips to the Snowy Mountain area for trout in the last year.

Q “On that trip did you mainly fish –	<i>In a lake from a boat</i>	1
	<i>In a lake from the shore</i>	2
	<i>In a river or stream</i>	3

This question asked for first preference in fishing mode, though some respondents gave multiple responses. Trout fishers seem equally divided in terms of preferred primary mode, with rivers and streams being slightly less popular than the lake fishing categories. The results indicate that 71% of trout fishers have lake fishing as their preferred mode. In retrospect the question could have asked fishers to estimate their days fished in each mode, but this may have had significant recall bias.

Table 13: Preferred mode of trout fishing

	No. of responses*	
Lake from a Boat	56	35%
Lake from the shore	59	36%
in a river or stream	48	29%
Total	163	100%

* Where respondents gave multiple responses, these responses were weighted equally to give a total response

Question 11: Preferred use of bait, lures and flies

Q “On that trip did you mainly fish –	<i>bait</i>	1
	<i>lures</i>	2
	<i>flies</i>	3

Question 11 asked for first preference in fishing for trout. Table 14 reports that lure fishing is the preference of 48% of anglers, while bait is 27% and fly fishing 25%.

Table 14: Preferred mode of fishing for trout

Fish using . . .	No. of responses*	
Bait	45	27%
Lure	79	48%
Fly	40	25%
Total	163	100%

* Where respondents gave multiple responses, these responses were weighted equally to give a total response

3. Discussion

This was the first use of the RFL database which was created following the introduction of the licence July 1998. This study took a 1% stratified sample and we believe it was representative of the total licensed recreational fishing population in NSW in that period. There were 137,649 freshwater licence sales in 1998-99 as reported in Table 1.

The survey results can be used to extrapolate from the sample to the total of the licensed population. We can also take this further to include the following categories of non-licensed freshwater fishers:

- Licence Exempt fishers (either pensioner concession card holders who are above 60 years of age, or minors under 18 years of age)
- Unlicensed fishers

This would then enable an estimate of the total freshwater fishing population in NSW to be obtained. This is required later in the study when estimating regional expenditure in the Snowy Mountains.

Levels of compliance in NSW during the first year of the freshwater RFL are unknown. A Departmental estimate of 5% is proposed to be added to represent fishers without licences. It is unknown how accurate this is. Thus to the 137,649 licensed fishers we add 5% and this becomes 144,531 fishers who are either licensed or fishing illegally without a licence.

Estimates of licence exempt fishers can be inferred from the previous telephone survey of NSW anglers by Pepperell (1996). Pepperell (1996) estimated that 12.9% of anglers were under 18 years of age and 15.3% were over 55 years of age. Given that our survey indicated that 9.1% of RFL holders were over 60 years old, only 5% are presumed to be pensioner concession holders. We therefore propose an adjustment of 18% to allow for licence exempt fishers. 144,531 fishers translates to 170,547 fishers in total.

The total level of fishing effort in days fished can also be calculated. The current survey found that days fished in freshwater were an average of 11.4 days per fisher. Table 15 reports estimates the number of fishers and days fished following the guidelines above.

Table 15: Estimates of freshwater fishing numbers and effort in NSW in 1998-99 from licence sales and survey data.

	Licence Sales	Adjust for unlicensed fishers (Add 5%)	Adjust for licence exempt fishers (Add 18%)
No. of fishers	137,649	144,531	170,547
Effort (days fished per year)	1,569,200	1,647,660	1,944,239

Previous estimates of NSW freshwater fishers and effort summarised in McIlgorm and Pepperell (1999) indicates that 29% of all NSW fishers are freshwater fishers.

Table 16: Estimates of freshwater fishing numbers and effort in NSW from Pepperell (1996).

Pepperell (1996)	All Rec. F	% FW	Total FW
NSW Fisher nos.	802,000	29%	232,500
Days	10,025,000	29%	2,907,250

Comparing Table 15 and 16 we can see that the results derived from the RFL survey are lower than those from 1996 when there was no payment required. The total number of fishers is approximately 41% lower than in the 1996 survey. This difference would represent those not choosing to buy a licence and potential estimation errors in the percentage of FW fishing activity in the Pepperell (1996) study and in the current estimates.

Inference from results

The results of the sample in the survey can be used for further inference. Table 17a illustrates the numbers of licensed fishers and estimated anglers from records of licence holders in each state. There are approximately 43,000 Victorians who hold a NSW RFL and an additional 10,000 persons from Victoria may also be fishing in freshwater in NSW.

Table 17a: Inferred numbers of NSW recreational licence holders in each state.

State	%	No. RFL Holders	Total No. Fishers
NSW & ACT	65%	88,819	110,046
VIC	31%	42,902	53,156
SA	2.8%	3,918	4,855
QLD	1.2%	1,608	1,992
NT	0.1%	201	249
WA	0.1%	201	249
Total	100.0%	137,649	170,547

Table 17b: Inferred numbers of recreational licence holders in each NSW postcode area.

NSW Postcode Region	%	No. RFL Holders	Total No. Fishers
North Coast	4%	3,215	3,984
Western NSW	14%	12,258	15,187
New England	12%	10,650	13,196
Central C & Hunter	7%	6,330	7,843
Sydney	18%	15,975	19,793
South Coast	4%	3,617	4,482
ACT	19%	16,578	20,540
Southern NSW	23%	20,195	25,022
Total (NSW)	100%	88,819	110,046

Table 17b estimates that freshwater fishing licence holders in Sydney and Canberra are almost numerically equivalent and both are exceeded by RFL holders in Southern NSW. Western NSW has 12,000 RFL holders and may have more anglers than this.

Frequency of freshwater angling is reported in Figure 1 and 2. The results reported in Table 10a illustrate 59% of anglers fish in rivers and streams. By inference, this is between 80,000 RFL holders and 101,000 anglers. NSW lakes have 27,300 RFL holders and 33,800 anglers in total.

The NSW trout fishery

From the total RFL population estimates and the survey results we can estimate the numbers of anglers in different activity segments.

Table 18a: Preferred fishing segments, RFL and angler numbers.

Preferred Fish	%	No. RFL Holders	Total No. Fishers
Coastal natives	12%	16,518	20,466
Inland natives	57%	78,460	97,212
Trout	31%	42,671	52,870
Total	100%	137,649	170,547

Table 18b: Preferred trout fishing areas, RFL and angler numbers.

Trout Areas	%	No. RFL Holders	Total No. Fishers
Northern NSW	9%	3,842	4,760
Central NSW	27%	11,525	14,279
Southern NSW	64%	27,318	33,847
Total	100%	42,685	52,887

Table 18c: Preferred fishing segments, days fished for RFL holders and all anglers.

Preferred Fish	%	Days Fished (RFL)	Days (Total)
Coastal natives	12%	188,304	233,309
Inland natives	57%	894,444	1,108,216
Trout	31%	486,452	602,714
Total	100%	1,569,200	1,944,239

Table 18d: Preferred trout fishing areas, days fished for RFL holders and all anglers.

Trout Areas	%	Days Fished (RFL)	Days (Total)
Northern NSW	9%	43,781	54,245
Central NSW	27%	131,342	162,733
Southern NSW	64%	311,329	385,737
Total	100%	486,452	602,714

Tables 18a & c report the extrapolations of the number of fishers and days fished state-wide for the different fishing segments among NSW freshwater anglers. Tables 18 b & d report the number of fishers and days fished in the trout fishing segment of freshwater fishing activity.

The number of fishers who go fishing in the southern region of NSW for trout is between 27,300 and 33,900 persons. Many of these will be multiple trips and this will be investigated in Part II of the project report. The days fished by the fishers in the southern trout fishery total between 311,000 and 386,000. This is an average of 11.3 days per fisher.

The difference between the lower and higher figure represents the allowance for persons fishing without a licence (legally or illegally). It is not possible to tell how these estimates compare with any other estimates of fishing in the Snowy Mountains trout fishery.

Recommendation

We propose that steps must continually be taken to a culture which will strengthen and validate database integrity. Such steps could include:

- Producing a form of ID to validate identity and personal details at the agency;
- Publicising that the licence data is used for management and needs to be accurate;
- Offering prizes as on previous occasions to promote the correct information being given – a competition or draw in which the winner must be easily contactable.

4. Conclusions from Part A

This report has presented the survey results from a sample of recreational fishers who held a RFL in the 1998-99 period.

The information displayed is for more than just trout fishers and gives the Department of Fisheries and the Recreational Freshwater Licence Expenditure Committee (RFLEC) an improved view of the pattern of freshwater recreational fishing in NSW.

The study has estimated that up to 170,000 freshwater fishers in NSW fish over 1.9 million days per annum. If just recreational licence holders are considered this is still 137,000 people and over 1.5 million days.

It has revealed that 32% of NSW RFL holders are from Victoria. Between 43,000 – 54,000 Victorian fishers come to fish in NSW each year. The study has also shown the importance of freshwater angling in NSW. In contrast the freshwater fishing activity attributable to Sydney is low and could potentially be bolstered by advertising in conjunction with NSW Tourism initiatives.

The survey indicates that Stream and river fishing is preferred and this may require more recognition in comparison to managing lakes and dams. Similarly the preferred fish species are inland native fish (57%) as opposed to trout fishing (31%). This may have impacts for management of the different species groups.

Trout fishing is a significant activity in NSW. Between 42,500 – 52,900 persons spend between 486,000 - 603,000 days fishing for trout. Of this 64% is in the South of the state in the Snowy Mountains trout fishery representing between 27,300-33,900 persons fishing between 311,000- 386,000 days per year.

In summary the Snowy Mountains has NSW's most significant trout fishery and the economic expenditure associated with the fishery is estimated in Part B of this report.

Part B:
Snowy Mountain trout fishing
and business surveys

Part B: The Snowy Mountain trout fishing and business surveys

5. Introduction - Trout Fishing Activity in the Snowy Mountains

Trout fishing is a significant activity in NSW. Part A of the report identified that between 42,500 - 53,000 persons spend between 486,000 - 603,000 days fishing for trout in NSW. Of this 64% of persons fish in the South of the state in the Snowy Mountains trout fishery representing between 27,000-34,000 persons fishing for between 311,000- 386,000 days per year (see Table 1a and 1b).

Table 1a: Preferred trout fishing areas in NSW, RFL and angler numbers

Trout Areas	%	No. RFL Holders	Total No. Fishers
Northern NSW	9%	3,842	4,760
Central NSW	27%	11,525	14,279
Southern NSW	64%	27,318	33,847
Total	100%	42,685	52,887

Table 1b: Preferred trout fishing areas in NSW, days fished for RFL holders and all anglers

Trout Areas	%	Days Fished (RFL)	Days (Total)
Northern NSW	9%	43,781	54,245
Central NSW	27%	131,342	162,733
Southern NSW	64%	311,329	385,737
Total	100%	486,452	602,714

As explained in Part A, the RFL (Recreational Fishing Licence) figure is estimated by expanding directly from our 1% sample. The total figure incorporates a factor of 18% for licence exempt fishers (youth and pensioners) and then adjusting for unlicensed fishers (5%) as discussed previously in Part A.

The trout fishery in the south of NSW is the largest of the state's trout fisheries. In the telephone survey trout fishers who had fished in southern NSW were asked questions about their fishing trip expenditure in the last year. The results of the questionnaire are presented in the next section.

Following the telephone survey results the results of the face to face survey of anglers are presented. These are then compared with the telephone survey and regional expenditure estimates for anglers in the Snowy Mountain region are estimated. The results of the business survey are reported and the results compared with the estimates of expenditure generated from fisher surveys. The study finishes with a discussion of the results and their implications.

6. The telephone survey

In this section the telephone survey is used to give one estimate of recreational fishing expenditure. This is then supplemented with the results from the face to face survey.

In the telephone survey a total of 163 anglers (22.9% of the 712 survey respondents) had fished for trout in the Snowy Mountains in the last 12 months.

- The average days fished per fisher in the Snowy were 10.8 days per annum;
- The average trip length was 4.1 days, with 3.6 days fishing;
- Fishers undertook an average of 3.0 trips per annum.

This represented 1,756 days fished on 493 trips. Trips varied in length between 1 and 42 days, as reported in Figure 1.

Figure 1: Frequency of trip length of fishers in the Snowy as reported from the telephone survey

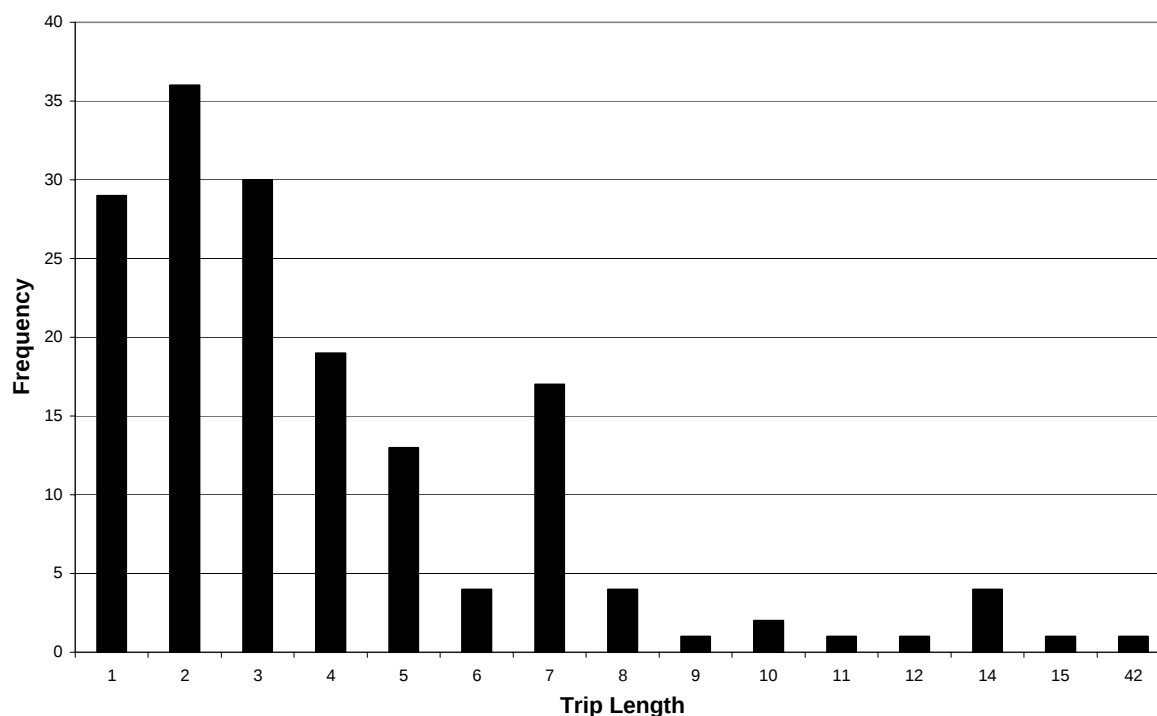


Figure 1 reports that 95 fishers (58%) had a trip of 3 days or less, with only 15 (9%) staying more than 7 days and 29 fishers (18%) did day trips. This impacts expenditure as day trip fishers do not generally require accommodation. Table 1c shows the origin of respondents.

Table 1c: Residence of visiting anglers in the telephone survey

	Total	Per cent
ACT	23	14.1
NSW	105	64.4
Qld & SA	2	1.2
VIC	33	20.3
Total	163	100

Expenditure by Trout fishers in the Snowy Mountains

After a brief introduction from the telephone interviewer, the respondents were asked a series of questions about their previous 12 months fishing, culminating in 2 questions regarding their trip costs, as shown below in Figure 2. This survey was also used for the face to face surveys interviews.

Figure 2: Expenditure questions from the Snowy Mountain trout fishery survey.

Q13 “Thinking of your trip costs now, for yourself and accompanying dependants, how much do you think you spent in the SNOWY MOUNTAINS AREA on that trip on these items: (READ LIST)

- | | | |
|----|---|---------|
| a. | Fishing Related costs (purchased or hired) | |
| | Tackle | \$_____ |
| | Bait/berley | \$_____ |
| | Boat hire | \$_____ |
| | Boat Fuel | \$_____ |
| | Fishing clothes/apparel (eg. waders, hat, vest) | \$_____ |
| | Other fishing equipment
(eg. landing nets, sunscreen, insect repellent) | \$_____ |
| | Fishing guides/boat charter | \$_____ |
| b. | Accommodation? | \$_____ |
| c. | Eating out | \$_____ |
| d. | Other Food & Drink? | \$_____ |
| e. | Other Entertainment (eg shopping, skiing, tours, souvenirs, pub, club, poker machines, magazines, videos) for you and your dependants? | \$_____ |
| f. | Anything else (SPECIFY) | \$_____ |
-

Q14 a. On that trip did you travel to the Snowy Mountains area in your own vehicle?

Yes 1 No 2

b. (IF YES) About how many Kms is it between
your home and the Snowy Mountains area – one way? _____ kms

c. About how many kms did you travel
within the Snowy Mountains region? _____ kms

d. What is the engine capacity of the vehicle you went in? _____ litres

Telephone survey results

Respondent's answers to these questions are reported in this section. General expenditure on trout fishing in the Snowy Mountains is reported in Table 2 below.

Table 2: Expenditure of licensed trout fishers in the Snowy Mountains region (telephone survey)

Expenditure (average fisher)	Per day fished	Per trip	Per yr	%
Fishing Related	\$22.42	\$ 79.82	\$241.48	18.1
Travel	\$32.55	\$ 115.86	\$350.52	26.2
Accommodation	\$29.33	\$ 104.43	\$315.93	23.7
Food and Entertainment	\$33.22	\$ 118.28	\$357.82	26.8
Other Expenditure	\$6.48	\$ 23.07	\$69.80	5.2
Total	\$124.00	\$ 441.46	\$1,335.55	100%

Table 2 reports the average expenditure of trout fishers in the Snowy Mountains. The average fisher spent \$1,335.55 in the Snowy Mountains in 1998.

This indicates that overall average expenditure was \$441 for each trip, during which an average of 3.6 days were occupied fishing. Therefore, the estimated average expenditure per day fishing was \$124. Converted to annual expenditure, this results in an estimate of \$1,335.55 per angler per annum spent on fishing in the Snowy Mountains region.

The major expenditure items were accommodation (\$315 per annum, or 23.7% of total expenditure), food and entertainment (\$357, or 26.8%), travel (\$350, or 26.2%), items directly related to fishing (\$241, or 18.1% of the total).

Our survey shows that 26% of expenditure in the Snowy was travel related, which is not surprising, given the location of the Snowy Mountains. It is important to note the expenditure on travel is imputed from the kilometers travelled and represents money spent in the Snowy Mountain region. This will be discussed further in the travel expenditure section.

Our survey shows that 12% of expenditure was fishing related. Details of fishing expenditure are shown in Table 3.

Table 3: Fishing related expenditure of licensed trout fishers in the Snowy Mountains region (telephone survey).

Fishing Related Expenditure (average fisher)	Per day fished	Per trip	Per yr	%
Tackle	\$ 10.92	\$ 38.87	\$ 117.58	49%
Bait	\$ 2.41	\$ 8.57	\$ 25.93	11%
Boat Hire	\$ 0.80	\$ 2.86	\$ 8.65	4%
Boat Fuel	\$ 3.49	\$ 12.41	\$ 37.55	16%
Fishing Clothes	\$ 3.00	\$ 10.69	\$ 32.33	13%
Fishing Equipment	\$ 1.44	\$ 5.13	\$ 15.53	6%
Fishing guides	\$ 0.36	\$ 1.29	\$ 3.92	2%
Total	\$ 22.42	\$ 79.82	\$ 241.48	100%

Expenditure on fishing tackle accounts for 49% of fishing expenditures, with substantial amounts also being spent on boat fuel, fishing clothes and bait. The survey reported that 16% of expenditure was for accommodation. Details of accommodation expenditure are shown in Table 4.

Table 4: Accommodation expenditure of licensed trout fishers in the Snowy Mountains region (telephone survey).

Accommodation Type	% fishers in Acc Type	Ave Exp (per Trip)
Caravan Park – tent or own caravan	25%	\$ 67.38
Caravan Park – on site van or cabin	25%	\$ 192.68
Hotel	3%	\$ 300.00
Motel	3%	\$ 452.00
Friends/ relatives/other	44%	\$ 84.80
Total	100%	

Table 4 reports that 25% of fishers pay for accommodation in Caravan Parks – tent or own caravan at an average cost of \$67 per trip, and a further 25% in Caravan Parks – on site van or cabin at an average cost of \$193 per trip. Approximately 50% of fishers pay for accommodation in Caravan Parks. The survey found that only 6% had hotel/motel accommodation and 44% stayed with friends or used other accommodation. The telephone survey did not determine what constituted other accommodation, but may be use of vehicles for sleep prior to fishing early morning fishing expeditions.

Other expenditure/ entertainment

Survey participants were asked about their food and entertainment expenditure whilst fishing in the Snowy. The results are reported in Table 5a&b.

Table 5a: Trout angler Food and Entertainment expenditure.

	Per Day Fished	Per Trip	Per Yr
Other food & drink	\$17	\$60	\$181
Eating out	\$11	\$38	\$114
Other entertain/shopping	\$3	\$21	\$63
Total	\$33	\$118	\$357

The average expenditure on entertainment, shopping, food and drink per day was \$33.18 per angler. Approximately (22%) of anglers did not spend on entertainment, or did not reply to the survey question. Table 5b reports entertainment expenditure by accommodation type and reports that, 50% of entertainment spending was by people in other accommodation /friends and relatives, and just over 30% of entertainment spending was by fishers in caravan parks.

Table 5b: Trout angler expenditure on entertainment by accommodation categories in the Snowy Mountains region.

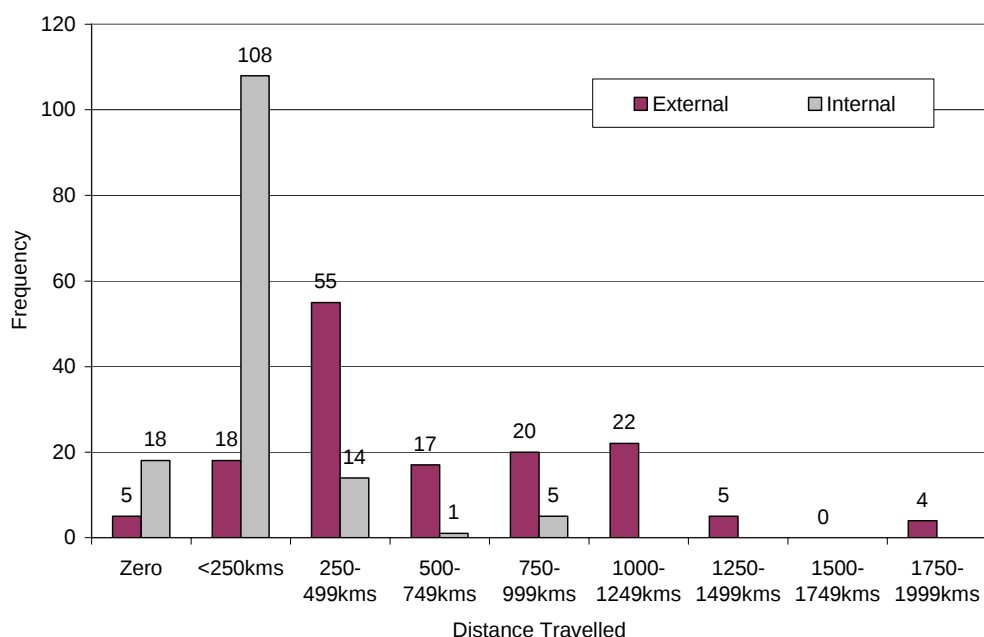
Accommodation Type	Entertainment Expenditure		
	Total		Ave per day
Caravan Park – tent or own caravan	\$ 2,895	15%	\$ 21
Caravan Park – on site van or cabin	\$ 3,065	16%	\$ 19
Hotel	\$ 1,410	7%	\$ 74
Motel	\$ 1,610	8%	\$ 41
Friends/ relatives/ other	\$10,299	54%	\$ 36
Total	\$19,279	100%	\$ 31

The highest daily entertainment expenditure was by those in hotels (\$74/day), followed by motels (\$41/day), friends and relatives/ other (\$36/day) and those in caravan parks (\$20/day).

Fishers who did not spend on entertainment, presumably treat their fishing activity as the focus of their activities. The proportion who did not spend on entertainment varied from 25% for those who stay in hotels, up to 70% for those who stay with friends and relatives.

Travel expenses

In order to estimate the costs of travel within the Snowy Mountains area, on fishing trips, anglers were asked a series of questions relating to their travel to, within and from the Snowy area. Of the 163 anglers interviewed, 146, or 90% had driven their own vehicle to the area.

Figure 3: Frequency plot of the distance travelled to and within the Snowy Mountain area by fishers

The number of kms per trip including travel to, from and within the Snowy ranged from 15-2994 km, with an average of 601km per trip as reported in Figure 3. The average distance travelled within the Snowy region (included in the above total distance) averaged 135kms and ranged between 1 km to 998 kms.

Respondents were asked about the engine capacity of their car to infer trip expenditures. Australian Tax Office (ATO) travel allowances were used to impute travel costs - 47c/km for cars less than 1.6 litres, 53.1c/km for cars 1.6-2.6 litres, 53.5c/km for cars greater than 2.6 litres. This enabled the expenditure on travel to be estimated.

Since we are attempting to measure the expenditure of trout fishers in the Snowy region the total kilometers travelled times the rate per kilometer was used to measure total imputed travel expenditure for a fisher on a trip. One third of this total was taken to be spent in the Snowy region. This was derived by assuming one third of the ATO rate includes insurances, repairs and overhead etc, which would not be attributable to the Snowy. The balance of two thirds represented travel to, from and in the Snowy, this total travel being halved to give the one third estimate. This means that in Table 2 travel expenditure was \$347.58 per trip as an imputed value, but that only one third of this, \$115.86 would have been spent in the Snowy region.

Guiding

Fish guiding services are available in the Snowy region. Of the 163 licensed fishers interviewed only 4 of the sample had paid for the use of a guide. The average cost was \$66, ranging up to \$108. Trout guiding is also evaluated in the business survey (see later in this study).

Summary

This section has reported expenditure estimates from the telephone survey. These will be cross checked by using the face to face survey to confirm the estimates.

3.0 The Face to Face Survey

Field Survey Methods

In order to obtain a second, independent set of estimates of expenditure of trout anglers in the Snowy Mountains region, field interviews were conducted with persons who were observed to be fishing in the area. The objective of this secondary set of data was to compare real-time recall information with the potentially longer term recall data from the telephone survey of licence holders, and, by random contact with anglers, to obtain estimates of numbers of fishers who did not hold licences, and estimates of expenditure of these latter groups.

Three trained field interviewers were used for this phase of the study. Interviewers were required to contact anglers randomly through the study region, and to conduct face to face interviews with them. So that comparisons could be made, essentially the same survey instruments (interview forms) were used in both the telephone and field interview segments. Interviews were conducted at many access points and shore sites through the area. In the course of field interviews, it was anticipated that anglers who resided within the study area would be contacted, and interviewers were requested to restrict the number of such interviews to about 10% of the total (determined by postcode at the beginning of the interview). Interviews were conducted over an eight week period from early October to early December 2000.

Field Survey Results

Excellent cooperation was obtained from anglers by interviewers. Total refusals numbered only 6, or 2% of the total number of interviews attempted. A total of 298 successful interviews were completed, 31 with locally resident anglers and 267 with anglers who were visiting the Snowy Mountains region from outside the area. The origin of visiting anglers is shown in Table 6.

Table 6. Residence of visiting anglers

	Total	Per cent
ACT	72	27.1
NSW	134	50.4
Qld & SA	1	0.4
VIC	59	22.2
Total	266	100

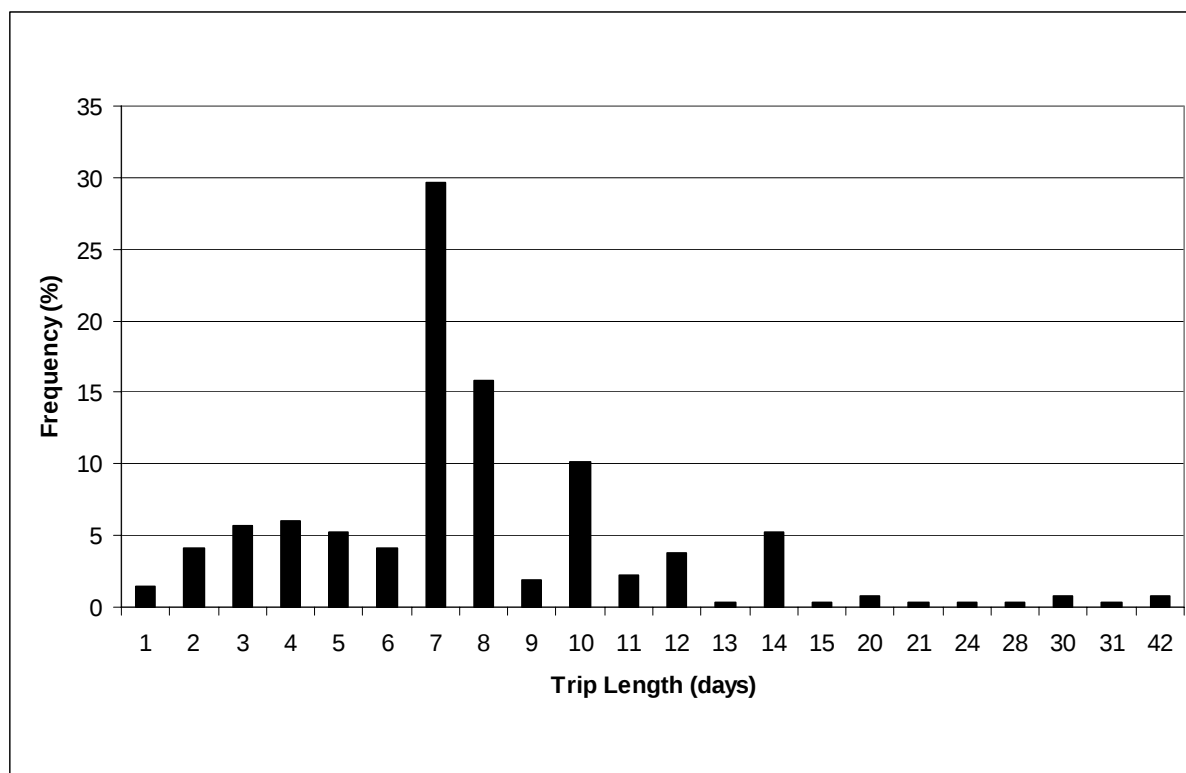
Table 6 shows that just over half (50.4%) of visiting anglers came from New South Wales, 27.1% from the ACT, 22.2% from Victoria and 0.4% (one angler) from Queensland.

Number of days fished per annum and frequency of trip length

The average number of days fished in the Snowy Mountains area was estimated at 18.7 days per annum, and the average (current) trip length was 8.1 days, of which 7.2 days were spent fishing. If the current trip length is taken as indicative of previous trips within the past twelve months, interviewed anglers had made an average of 2.6 trips to the Snowy in the past year. Current trips varied in duration between 1 and 42 days (Figure 4).

This figure indicates that 11.2% of anglers had trips of 3 days or less, while 43 % fished for more than 7 days. Only 1.5% of anglers contacted were on single day trips.

Figure 4. Frequency of trip length of anglers in the Snowy region, as reported from the face to face field survey



Expenditure

The overall expenditure by field-interviewed trout anglers is shown in Table 7.

Table 7. Expenditure by trout fishers in the Snowy Mountains region (field survey)

Expenditure (average fisher)	Per Day Fished	Per Trip	Per Yr	%
Fishing Related	\$13.81	\$99.40	\$258.16	18.3
Travel	\$15.79	\$113.71	\$295.33	20.9
Accommodation	\$22.50	\$162.00	\$420.75	29.8
Food & Entertainment	\$22.11	\$159.20	\$413.48	29.3
Other Expend.	\$1.22	\$8.78	\$22.81	1.6
Total	\$75.43	\$543.09	\$1,410.54	100

This indicates that overall average expenditure was \$543 for each trip, during which an average of 7.2 days were occupied fishing. Therefore, the estimated average expenditure per

day fishing was \$75.43. Converted to annual expenditure, this results in an estimate of \$1,410.54 per angler per annum spent on fishing in the Snowy Mountains region.

The major expenditure items were accommodation (\$420 per annum, or 29.3% of total expenditure), food and entertainment (\$413, or 29.3%), travel (\$295, or 20.9%), items directly related to fishing (\$258, or 18.3% of the total).

Considering fishing-related expenditure, Table 8 shows the breakdown of expenditure on relevant items.

Fishing Related Expenditure (average fisher)	Per Day Fished	Per Trip	Per Yr	%
Tackle	\$4.80	\$34.56	\$89.76	34.8
Bait/Berley	\$1.25	\$9.00	\$23.38	9.1
Boat Hire	\$0.14	\$1.00	\$2.60	1.0
Boat Fuel	\$5.90	\$42.50	\$110.38	42.8
Clothes etc	\$1.32	\$9.50	\$24.67	9.6
Other gear	\$0.25	\$1.80	\$4.68	1.8
Guides	\$0.14	\$1.00	\$2.60	1.0
Total	\$13.80	\$99.36	\$258.06	100.0

Table 8. Fishing related expenditure of trout fishers in the Snowy Mountains area from the field survey

This table shows that, for anglers contacted in the field, purchase of boat fuel was the largest contributor to expenditure on fishing related items within the Snowy region, followed by expenditure on fishing tackle, fishing clothes and equipment, and bait and berley.

Accommodation

As noted above, expenditure on accommodation was the higher than other categories. The telephone based survey noted that a high proportion of anglers (44%) stayed with friends/relatives in 'other' forms of accommodation, which seemed to be intuitively high. The equivalent figures derived from the face to face field survey are presented below in Table 9.

Table 9: Places of accommodation by visiting trout anglers

Accommodation Type	Number	% Fishers
Caravan Park - tent or own	89	33.5
Caravan Park - onsite van / cabin	86	32.3
Hotel	17	6.4
Motel	6	2.3
Bed and Breakfast	24	9.0
With Friends or Relatives	33	12.4
Other	11	4.1
Total	266	100

The results presented indicate that about two thirds of anglers stay in caravan parks, but only 16.5% with friends or relatives or in other style accommodation. This figure (16.5%) is considered to be a more realistic one than that derived from the telephone survey.

Other expenditure/entertainment

Apart from travel and accommodation, the other items of expenditure which were not directly related to fishing, are summarised in Table 10

Table 10: Expenditure by trout anglers on food, drink, entertainment and shopping in the Snowy Mountains area. Face to face field survey.

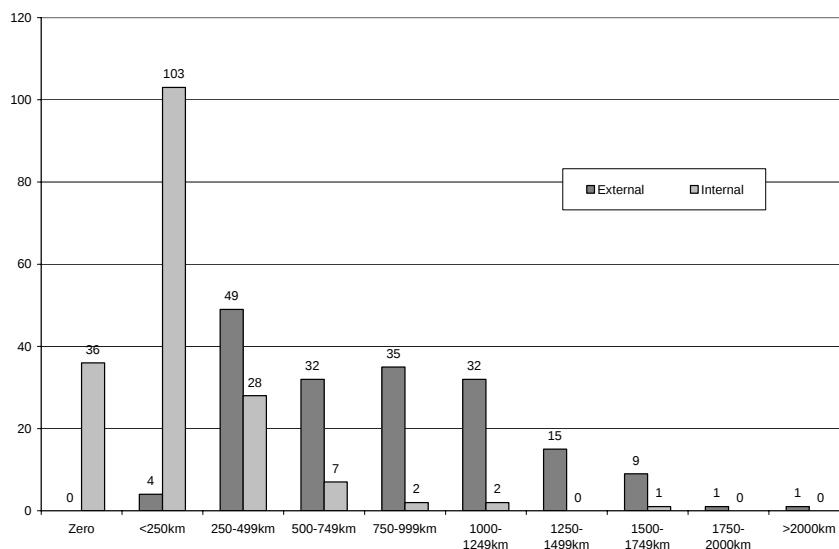
	Per Day Fished	Per Trip	Per Yr
Other food & drink	\$10.40	\$74.90	\$194.53
Eating out	\$5.96	\$42.90	\$111.42
Other entertain/shopping	\$5.75	\$41.40	\$107.53
Total	\$22.11	\$159.20	\$413.48

The average expenditure on these items (entertainment, shopping, food, drink etc) was estimated at \$22.11 per day, \$159 per trip and \$413 annually.

Travel expenses

In order to estimate the costs of travel within the Snowy Mountains area, on fishing trips, anglers were asked a series of questions relating to their travel to, within and from the Snowy area. Of the 267 anglers interviewed, 178, or 66.7% had driven their own vehicle to the area. Total distances travelled to, within and from the Snowy ranged from 254 to 2575 km, averaging 960 km per trip. The average distance travelled within the Snowy (part of the above total distance) ranged from 1 to 1,500 km, and averaged 164km.

Figure 5: Frequency plot of the distance travelled to and within the Snowy Mountain area by fishers (field survey)



The engine capacity of respondent's vehicles was used to calculate trip expenditures (all respondents who had driven vehicles gave an engine capacity). Tax office travel allowances were used to impute travel costs: 47c/km for cars with capacities less than 1.6 litres, 53.1c/km for capacities 1.6 - 2.6 litres, and 54.5c/litre for capacities greater than 2.6 litres. The travel

expenditure was adjusted to one third of the imputed travel value as in the telephone survey to reflect travel expenditure made in the Snowy Mountain region.

Guiding

Only two anglers contacted in the field reported using fishing guides. Their average expenditure was \$140 on this item which is evaluated in the Business Survey (Section 5.0).

Non licence holders

Of the 267 anglers interviewed in the field, 36, or 13.5% did not hold a recreational fishing licence. Of those who did not hold a licence, 29, or 80.5%, were aged 60 years or older. The remaining 7 non licence holders were aged 18-24 (8%), 25-39 (3%) and 40-59 (8%). These anglers were not asked if they were exempt from holding a licence for any reason. Average daily expenditures of non licensed anglers were calculated at \$68.18, which is slightly less than the overall average of \$75.43. However, non licensed angler trips were longer than the overall average (8.76 compared with 7.2 days) resulting in a higher average trip expenditure of \$597 for non licensed anglers. Expenditure by non licensed anglers was very similar to that of licensed anglers in all categories except travel, in which case, non licensed average daily expenditure was \$8.65 compared with an overall daily average of \$15.79.

4.0 Comparison of angler surveys and expenditure estimates

In order to compare and discuss any differences in estimates of expenditure found in the two different survey methods, expenditure on major categories are combined in Table 11. In order to obtain a composite estimate of expenditure from each of the surveys, a weighted mean was calculated for each item, or area of expenditure. This mean was determined to be the simple average of estimates derived from the two methods (face to face and telephone). It is weighted however since the sample size of the telephone survey (163) was smaller than that of the face to face survey (267). Justification for weighting in this direction is based on the more random nature of the telephoned sample (see below) tempered by the likelihood of more accurate recall by face to face interviewees actually involved in their current fishing trip to the Snowy area.

Table 11: Estimates of expenditure on the major categories, by survey method, together with combined weighted estimates, and proportional contributions for each.

Expenditure (average angler)	Per Day Fished			Per Trip			Per Year			%
	Field Survey	Phone Survey	Weighted Estimate	Field Survey	Phone Survey	Weighted Estimate	Field Survey	Phone Survey	Weighted Estimate	
Tackle	\$ 4.80	\$ 10.92	\$ 7.86	\$ 34.56	\$ 38.87	\$ 36.72	\$ 89.76	\$ 117.58	\$ 103.67	41.5
Bait	\$ 1.25	\$ 2.41	\$ 1.83	\$ 9.00	\$ 8.57	\$ 8.79	\$ 23.38	\$ 25.93	\$ 24.65	9.9
Boat Hire	\$ 0.14	\$ 0.80	\$ 0.47	\$ 1.00	\$ 2.86	\$ 1.93	\$ 2.60	\$ 8.65	\$ 5.62	2.3
Boat Fuel	\$ 5.90	\$ 3.49	\$ 4.70	\$ 42.50	\$ 12.41	\$ 27.46	\$ 110.38	\$ 37.55	\$ 73.97	29.6
Fishing Clothes	\$ 1.32	\$ 3.00	\$ 2.16	\$ 9.50	\$ 10.69	\$ 10.10	\$ 24.67	\$ 32.33	\$ 28.50	11.4
Other Gear	\$ 0.25	\$ 1.44	\$ 0.85	\$ 1.80	\$ 5.13	\$ 3.47	\$ 4.68	\$ 15.53	\$ 10.10	4.0
Fishing Guides	\$ 0.14	\$ 0.36	\$ 0.25	\$ 1.00	\$ 1.29	\$ 1.15	\$ 2.60	\$ 3.92	\$ 3.26	1.3
Total	\$ 13.80	\$ 22.42	\$ 18.11	\$ 99.36	\$ 79.82	\$ 89.59	\$ 258.06	\$ 241.46	\$ 249.76	100.0

There are some basic differences between the two 'populations' which were surveyed. In the telephone survey, respondents were holders of fishing licences selected randomly throughout the State. In the case of the field survey, respondents were actively fishing in the Snowy Mountains area and were not necessarily licence holders. Because of the higher statistical chance of contacting regular versus infrequent anglers in the field, it is likely that the field surveyed anglers would tend to be more active than a random sample of anglers. This was borne out by the fact that field interviewed anglers fished in the Snowy region on an average of 18.7 days in the past year, and an average of 7.2 days during their current trip. Telephoned anglers, on the other hand, fished an average of 10.8 days in the Snowy in the past year, and an average of 3.6 days during their most recent trip there. As well, only 1.5% of field-interviewed anglers were on day trips, whereas 18% of telephoned anglers indicated that their last fishing trip to the Snowy was a day trip.

On the other hand, the more avid field-interviewed anglers might be expected to arrive in the Snowy area better equipped for fishing than the more infrequent angling population interviewed by telephone, and therefore, possibly spend less on fishing related items in the area.

Considering both sets of estimates, it is apparent that the daily expenditures of field anglers on most items were indeed generally less than those of telephoned anglers, although, because of the longer trip duration of field anglers, the expenditures per trip of each group were more similar. This is probably because, as noted, the more avid field anglers had already purchased such items as fishing gear before arriving in the Snowy, and may have been better prepared with respect to provision of food and drinks, 'other' expenditure items, and accommodation

bookings. The other area of considerably less daily expenditure by field surveyed anglers was that of travel. Here, a likely explanation is that these more avid anglers spent more time at their actual fishing sites, and less time travelling, than the less avid telephone surveyed anglers.

Table 12: Estimates of expenditure on fishing related items, by survey method, together with combined weighted estimates, and proportional contributions for each.

Expenditure (average angler)	Per Day Fished			Per Trip			Per Year			%
	Field Survey	Phone Survey	Weighted Estimate	Field Survey	Phone Survey	Weighted Estimate	Field Survey	Phone Survey	Weighted Estimate	
Tackle	\$ 4.80	\$ 10.92	\$ 7.86	\$ 34.56	\$ 38.87	\$ 36.72	\$ 89.76	\$ 117.58	\$ 103.67	41.5
Bait	\$ 1.25	\$ 2.41	\$ 1.83	\$ 9.00	\$ 8.57	\$ 8.79	\$ 23.38	\$ 25.93	\$ 24.65	9.9
Boat Hire	\$ 0.14	\$ 0.80	\$ 0.47	\$ 1.00	\$ 2.86	\$ 1.93	\$ 2.60	\$ 8.65	\$ 5.62	2.3
Boat Fuel	\$ 5.90	\$ 3.49	\$ 4.70	\$ 42.50	\$ 12.41	\$ 27.46	\$ 110.38	\$ 37.55	\$ 73.97	29.6
Fishing Clothes	\$ 1.32	\$ 3.00	\$ 2.16	\$ 9.50	\$ 10.69	\$ 10.10	\$ 24.67	\$ 32.33	\$ 28.50	11.4
Other Gear	\$ 0.25	\$ 1.44	\$ 0.85	\$ 1.80	\$ 5.13	\$ 3.47	\$ 4.68	\$ 15.53	\$ 10.10	4.0
Fishing Guides	\$ 0.14	\$ 0.36	\$ 0.25	\$ 1.00	\$ 1.29	\$ 1.15	\$ 2.60	\$ 3.92	\$ 3.26	1.3
Total	\$ 13.80	\$ 22.42	\$ 18.11	\$ 99.36	\$ 79.82	\$ 89.59	\$ 258.06	\$ 241.46	\$ 249.76	100.0

This interpretation is also borne out by the fact that field interviewed anglers spent considerably more on boat fuel than telephoned anglers (an average of \$5.91 per day, \$42.50 per trip compared with \$3.50 per day and \$12.40 per trip). This implies that field anglers used boats more, and quite probably, fished more than telephoned anglers.

However, as noted, because their trip length was longer, the total expenditure per trip of field interviewed anglers surpassed that of telephoned anglers, but not by a large amount. The differences are even less when the average daily expenditures were expanded to annual estimates, based on the average number of days fished per annum in the Snowy region. In fact, the annual expenditures of each surveyed group were remarkably similar, differing by only 5% for the total estimate of all items combined. The proportional expenditures on each major item were also remarkably similar for each group, giving considerable confidence in the reliability of the estimates obtained. The weighted, combined estimates were therefore used to expand total expenditure estimates for all visiting anglers who fished in the Snowy Mountains region.

The use of dedicated fishing guides by anglers was only registered in 1-2% of the total sample of interviews in both surveys. In the telephone survey 3 anglers spent an average of \$66 on guiding and in the face to face survey two anglers spent \$140 each on the services of a guide.

Estimate of Total expenditure by Snowy Mountains Trout fishers

In Part A of this report we estimated that there were 27,318 licensed fishers and a total of 33,847 fishers who fished for trout in the Snowy Mountains area during the survey period (See Table 1a).

The total expenditure of trout fishers in the Snowy is estimated by multiplying average Snowy Mountain trout fisher expenditure (Table 12) by the estimated number of trout fishers in the

Snowy region (Table 1). The total annual expenditure estimates are reported in Table 13.

Table 13: Annual expenditure of Snowy Mountain trout fishers

Annual Expenditure	Average fisher expenditure	Licenced fishers	Total fishers
Fishing related	\$ 249.82	\$ 6,824,583	\$ 8,455,658
Travel	\$ 322.93	\$ 8,821,665	\$ 10,930,042
Accommodation	\$ 368.34	\$ 10,062,312	\$ 12,467,204
Food and Entertainment	\$ 385.65	\$ 10,535,187	\$ 13,053,096
Other Expenditure	\$ 46.31	\$ 1,264,960	\$ 1,567,285
Total	\$ 1,373.05	\$ 37,508,843	\$ 46,473,454

The average annual fishing expenditure of fishers from the telephone and face to face survey is used to estimate a total expenditure of \$46.5m attributable to recreational fishing in the Snowy Mountain region. Similarly the estimates of daily expenditure average between surveys can be extrapolated to give regional estimates as reported in Table 14.

Table 14: Regional estimates of fishing related expenditure categories

Fishing Related Expenditure (average fisher)	Per year (field survey)	Per year (telephone survey)	Per year Average	Regional Expenditure \$m
Tackle	\$89.76	\$117.60	\$103.68	\$3.681
Bait/Berley	\$23.38	\$8.57	\$15.97	\$0.567
Boat Hire	\$2.60	\$2.86	\$2.73	\$0.097
Boat Fuel	\$110.38	\$37.55	\$73.97	\$2.626
Clothes etc	\$24.67	\$32.33	\$28.50	\$1.012
Other gear	\$4.68	\$15.53	\$10.10	\$0.359
Fishing Guides	\$2.60	\$3.92	\$3.26	\$0.116
Total	\$258.06	\$218.36	\$238.21	\$8.456

Table 14 reports the expenditure on fishing related items is comprised of several distinct elements, particularly Tackle and Boat fuel. A regional expenditure estimate for bait expenditure and guiding services is also available by this method and will further examined in the business survey in section 3.

Discussion

There has been no previous attempt to survey the amount of expenditure associated with trout fishers in the Snowy Mountains recreational trout fishery.

An estimated \$46.5m is attributable to trout fishing activity and is expended in the Snowy Mountain area annually. This is a conservative estimate and comes from a sample of 429 fishers answering detailed interviews on their recreational trout fishing expenditure in the Snowy Mountains. If the telephone survey results were given precedence the regional expenditure estimates would be \$50.5m per annum which is indicative of the robustness of the estimate.

A further \$22.0m in car travel expenditure is attributable to the Snowy Mountains fishery, but is not spent in the Snowy area. Thus a total of \$68.5m of annual expenditure is attributable to the Snowy Mountain trout fishery. When full car expenditure is added the \$68.5m is comparable with the preliminary estimate of \$70.0m made by McIlgorm and Pepperell (1999) using pro rata methods on state wide recreational fishing expenditure estimates in 1998 values. However, the \$70.0m estimate included capital costs and was not as accurate as the current telephone survey estimate since it was not based on such specific recalled data.

In the current survey the capital expenditure of fishers on boats, trailers and outboard motors, fishing lodges, on-site caravans and the like, specifically purchased for fishing in the Snowy Mountains area has not been measured. There is also additional expenditure outside the Snowy region attributable to some of these. Neither did the estimates include expenditure by residents of the Snowy Mountains region. Additionally specialist 4 wheel drive vehicles have not been given any more weighting than the standard tax office allowance for vehicles in excess of 2.6 litres, again leading to a conservative estimate of travel costs.

In summary, the surveys estimate that there is an expenditure of \$46.5m in the Snowy Mountain region. The expenditure within Australia associated the Snowy trout fishery would be in excess of this and may be as high as \$70m per annum.

A comparison of the expenditure on trout fishing in the Snowy can be made with existing National Visitor Survey estimates. This is reported in Appendix 2.

In summary Appendix 2 shows that although fishers comprise only 1% to 4% of general visitor numbers to the Snowy Mountains, they contribute 2% of day visits and up to 15% of all overnights in the Snowy. In total, recreational fishers expend approximately 14% of all visitor expenditure in the Snowy Mountain region.

Recreational trout fishers spend slightly more per day than other day trippers and less average expenditure per overnight. Recreational fishers tend to stay longer and spend more per visitor over their longer stays than the average tourist visitor to the Snowy.

Conclusion

In this section we have estimated regional expenditure from anglers and reconciled the estimates with available information. The next section seeks to investigate the relationship between what anglers surveys suggest is being spent and how much businesses in the region can attribute to recreational fishing. The business survey is reported in the next section.

5.0 The business survey of the Snowy Mountain trout fishery

In this section the expenditure by recreational fishers in businesses in the Snowy Mountains is estimated by a survey of those businesses. The business survey aims to confirm estimates of the total expenditure from the telephone survey and face to face interviews reported in the previous section.

The Snowy Mountain area is noted for its tourism and has a sizable tourist industry based on the winter snow season. The snow industry is seasonal between May and October, depending on snow falls. In contrast the recreational trout fishery has a complimentary season of October to June in rivers, while lakes remain open all year around. The economic links between the recreational fishing activity and the skiing industry have not been investigated.

Background

Snowy Mountain tourist estimates were presented in the previous section from National Visitors Survey (BTR, 2000) and the Local Government Authority (LGA, 1998) survey.

The intention of the business survey was to supplement the expenditure survey results gained from angler surveys with an examination of the money received by businesses associated with trout fishing in the Snowy Mountain region.

Businesses that cater directly to recreational fishers and a variety of other tourist and tourism related businesses were selected so as to investigate expenditure contribution to the Snowy Mountains region.

The business survey target area reached South & East from Providence Portal, and extended to Dalgety in the south, and Cooma in the East, as shown in the map in Background section. This includes the major trout fishing areas of the Eucumbene, Jindabyne and associated rivers.

Visitor preferences in the Snowy region

The NVS survey reports that the 1.7m visitors to the Snowy Mountains Region in 1998 pursued a range of outdoor activities including skiing, walking and fishing. In the telephone survey of fishers we asked respondents who fished in the Snowy their main reason for coming to the Snow region.

It was found that among the recreational fishing licence holders contacted by telephone the primary reason for visiting the Snowy was:

- Fishing (71%),
- Other (26%),
- Business (2%), and
- Skiing (1%).

It is evident from telephone and face to face survey results that trout fishing is an important activity for visitors to the Snowy. In this section we investigate the expenditure of those trout visitors via the business survey of the local community.

The business survey

The business survey was undertaken in the early part of 2000 prior to the commencement of the ski season. Businesses within the selected area were sourced from the Telstra yellow pages, the NRMA, information brochures and data base information from the local tourist information centre. Visits to the area enabled selected businesses to be informally interviewed so as to determine the most appropriate approach to the business survey.

Sampling

For several smaller business segments a full sample was appropriate. For example, the fishing tackle industry, news agents and fishing guides.

It was found there were numerous types of accommodation, sources of entertainment and places to eat. For these, stratified random samples were taken. Where businesses were involved in several business areas (say accommodation and selling tackle), one survey was taken, and their sample was counted from their primary business area.

In the national visitors survey only establishments accommodating more than 15 rooms were interviewed which would emphasise large hotel accommodation. Given the nature of trout fishing we spread our selection of accommodation across all types of establishments. Fishers possibly prefer smaller establishments, or locations that have fewer large establishments. The survey recognised Caravan Park accommodation as particularly important for fishers.

From the visits to the Snowy Mountains, and after a variety of business owners and managers were approached the mail survey instrument was designed. Selected businesses were encouraged to fill in the survey and to give verbal opinions. The survey was mailed to 69 businesses and a stamped addressed envelope was included to encourage replies. After a period of one week each respondent was called by telephone to confirm receipt and to encourage them to fill and to post the survey. The reply rate from the survey was significant and is reported in Table 15.

Table 15: Surveys sent and replies received from different business segments.

	Total	Sample	Responses	Response as % of sample	Response as % of Total
Caravan	15	12	9	75%	60%
Other	138	27	10	37%	7%
Bait & Tackle *	19	15	5	33%	26%
Fishing Guides	7	4	3	75%	43%
Service Stations	41	6	1	17%	2%
Newsagents	6	5	1	20%	17%
Other	2	2	0	0%	0%
	228	71	29	41%	13%

*The Bait and Tackle sector includes both specialist shops and sports stores with significant fishing tackle business.

Of the 71 businesses approached, 29 completed and returned the survey, a reply rate of 41% which is considered to be high in this sort of mail survey.

Table 15 confirms that the survey covered a significant number of businesses in the Snowy region. The response rate from caravans parks was high while the response from other sectors varied. The respondents were encouraged to reply to the survey and interviewed to gain

insight into their unwillingness to reply. Box 1 below illustrates a mix of results and anecdotal findings from businesses in the Snowy.

Box 1: Survey business categories and their reliance on trout fishers

Caravan Parks – All parks approached indicated a strong reliance on recreational fishing activity.

Other Accommodation – Fishermen tend to stay at places that are very close to the water, where there is sufficient space to garage their boats, and with other fishermen. Perhaps we surveyed 60-70% of these. Many of the businesses sampled responded because they had strong commercial interests in the industry. Provision of accommodation is a cottage industry in the area. There are difficulties in gauging how representative the accommodation sample is.

Bait and Tackle – There are relatively few specialist operators, but a multitude of businesses that have bait and/or tackle sidelines. The major tackle outlets were contacted, but the volume of bait and tackle through other businesses is difficult to estimate.

Guides – There are relatively few specialist operators, but a multitude of fishing related businesses whose employees have minor guiding operations. Guides who advertised services were contacted, but the activity of part-time guides is difficult to estimate.

Service stations – Found sales to anglers too difficult to quantify. Of the limited responses some responded in terms of their bait sales. Estimating fuel sales to anglers travelling to and from the Snowy is difficult.

Newsagents – Indicated a perceived low market for magazines to anglers in the Snowy Mountains. Anecdotal evidence was that Fishing Magazines were less than 1% of magazine sales.

Restaurants – Several restaurants were approached and indicated a perceived low turnover from recreational fishers.

Box 1 illustrates the variety in businesses and their dependence on trout fishing. The expenditure of recreationalists on food and entertainment was difficult to measure as shopkeepers and innkeepers could not readily identify and separate recreational fishers.

The surveys were completed and returned by many businesses. The individual survey results were confidential and have been aggregated where required to protect identities and business interests.

Results

The results were aggregated and tabulated for each type of business interviewed. The thirty businesses surveyed had a gross business turnover in excess of \$11.6 million, of which \$3.4 million (29%) was fishing related. Confidentiality assurances given to businesses limit the reporting of the results to aggregate figures across numbers of businesses in a given category.

The turnover of sampled businesses was further investigated by separating the results into three regions: Cooma, Eucumbene and Jindabyne. Again, these results are not fully reported due to confidentiality constraints. The trout fishery related expenditure of each region was compared and it was found that Cooma accounted for 18%, Eucumbene 36%, and Jindabyne 45% of the total trout related expenditure. However the number and types of businesses in each area are not strictly comparable and this estimate from the sample should be treated with caution.

The sampled businesses responses were expanded to provide an estimate of fishing turnover in the Snowy Mountains Region, as reported in Table 16a and b.

Table 16a: The basis of expansion factors used to estimate fishing expenditure in the Snowy Mountains region.

	Total	Sample	Responses	Response as % of sample	Response as % of Total	Expansion factor
Caravan Parks	15	12	9	75%	60%	1.7
Other Accommodation	138	27	10	37%	7%	13.8
Bait & Tackle	19	15	5	33%	26%	3.8
Fishing Guides	7	4	3	75%	43%	2.3
Service Stations	41	6	1	17%	2%	41.0
Newsagents	6	5	1	20%	17%	6.0
Other	2	2	0	0%	0%	
	228	71	29	41%	13%	

Table 16b: The estimates of fishing expenditure in major fishing businesses associated with the Snowy Mountains region.

	n	Sample Turnover	Sample fishing turnover	Fishing as % of turnover	Expansion factor	Expanded Turnover	Expanded Fishing Turnover
Caravan Parks	9	\$ 5,845,000	\$ 2,343,450	40.0%	1.67	\$ 9,741,667	\$ 3,905,750
Other Accommodation	10	\$ 3,544,000	\$ 117,245	3.3%	13.8	\$ 48,907,200	\$ 1,617,981
Bait & Tackle	5	\$ 2,180,000	\$ 880,000	40.4%	3.8	\$ 8,284,000	\$ 3,344,000
Fishing Guides	3	\$ 84,000	\$ 84,000	100.0%	2.3	\$ 196,000	\$ 196,000
sub-total		\$ 11,653,000	\$ 3,424,695	29.0%	-	\$ 67,128,867	\$ 9,063,731
Service Stations	1	-	\$ 160,000	-	41	-	\$ 6,560,000
Newsagents	1	\$ 400,000	\$ 1,600	-	6	-	\$ 9,600
Other	0	-	-	-	-	-	\$ -
Totals	29	-	-	-	-	\$ 67,128,867	\$ 15,633,331

Table 16a reports the expansion factors for businesses to enable a regional estimate to be made. Table 16b reports that expansion is only possible for 4 business groups due to confidentiality restrictions due to small sample numbers. Table 16b (lower half) reports for service stations, newsagents and for other businesses which had single survey returns and results should be treated with caution.

Table 16b reports the high reliance of Caravan Parks (40%), fishing tackle outlets (40%) and fishing guides (100%) on recreational anglers. Businesses selling only bait and tackle had 100% fishing turnover, whereas for other businesses selling tackle, fishing related turnover was \$0.3 million of the \$1.6m of business turnover. Other forms of accommodation reported less than 4% of turnover as being from recreational trout fishers.

The sample is expanded in Table 16b to illustrate the total expenditure in businesses in the Snowy region obtainable from the survey. This is discussed below.

Guiding

The expenditure on trout fishing guides was estimated in the business survey to be \$196,000 per annum. Previous regional estimates from angler surveys report \$116,000 per annum (Table 14). We propose this as the range of expenditure of trout guides in the study area. There are other trout fishing guides who live outside the study area in Bomballa and Canberra. These guides are not included and the estimate is not a full estimate of the guiding activities in the Snowy Mountains due to the diverse nature of this business activity.

Discussion and conclusions

This study aimed to compare the survey results from anglers' expenditure with the business survey estimates of money expended in the Snowy Mountain region. Table 17 compares the business survey estimates (from Table 16) with the angler expenditure estimates from the telephone and face to face survey.

Table 17 reports that the business survey identified approximately \$15.6m of expenditure in the areas of travel, accommodation and fishing related expenditure. It was not possible to identify expenditure on food and entertainment and other expenditure due to difficulty in distinguishing the amount attributable to recreational fishers.

The estimates of total expenditure from the business survey are approximately 40%-50% of the estimates obtained from fisher surveys for several categories of expenditure; for example accommodation estimates were 44% of those estimated in the survey.

Accounting for travel cost expenditure in the business survey was difficult, as only one service station replied in spite of repeated requests from interviewers. Further investigation revealed survey responses were lowered by fundamental problems in identifying petrol sales to recreational fishers. The estimate of \$6.5 million spent in service stations should be therefore treated with caution. Also, boat fuel, which was a significant expenditure item in the other surveys, was not separated by proprietors.

Table 17: A comparison of estimates of fishing expenditure with estimates from the business survey in the Snowy Mountains region.

Annual Expenditure - Snowy Mountains Trout Fishers	By Telephone & Field survey	By Business Survey	Business S. as % of Telephone & Field Survey.
Fishing Related	\$8,455,658	\$ 3,549,600	42%
Travel	\$10,930,042	\$ 6,560,000	60%
Accommodation	\$12,467,204	\$ 5,523,731	44%
Food and Entertainment	\$13,053,096	\$ 13,053,096	<i>copy</i>
Other Expenditure	\$1,567,285	\$ 1,567,285	<i>copy</i>
Total	\$46,473,285	\$ 30,253,712	-

In Table 17 we propose that the expenditures on food and entertainment and other expenditure from the telephone and field surveys be accepted as probable estimates. On this assumption the business survey would be able to account for estimated expenditures by recreationalists in the Snowy of \$30.2m. The expenditure in businesses is higher than this, but the survey revealed some fundamental problems in measuring business activity attributable to recreational fishers.

For example the estimate of \$13.0m from the telephone and face to face survey spent by fishers on food and entertainment was almost impossible to trace in the local economy. Food retail outlets, cafes and restaurants and bottle shops had no way to identify sales to recreational fishers. Businesses reported increased sales associated with the fishing season and holiday times, but could not accurately estimate sales to recreational fishers.

The difference between the expenditure estimates from the telephone and field survey and the business survey can be explained as follows. Travel and boat fuel expenditure are likely underestimated in the business survey due to inability to distinguish fuel sales to anglers, either for vehicles or for boats.

Other reasons the business estimates may be low are related to the businesses interviewed and their representativeness of the sector surveyed. For example sales of fishing tackle via larger stores (eg. K-Mart) were not available and most service stations sell rods, sinkers, and considerable quantities of bait etc. Expansion of sample estimates was by business number and in the case of some business types, may not have sufficiently represented the diversity in businesses in the Snowy.

The total business revenue attributable to fishing was the focus of the survey. However caravan parks showed a strong dependence on trout fishing as it represents a substantial part of business income. Interviews confirmed that Caravan park income from recreational fishers is less than income from the skiing season, but importantly, continues almost all year round when the ski season closes. For many businesses in the Snowy their year round viability is assisted by the expenditure on the trout fishery and is an important marginal contribution to many different businesses.

The business survey has confirmed that expenditure in the Snowy is substantial and at least \$30m of the estimates derived from angler surveys \$46.5m has been accounted for in local businesses. This means that if there are 15 jobs associated with each \$1.0m in expenditure that trout fishing supports between 450 and 700 jobs in the Snowy region.

The three different surveys have also shown that the results from the telephone survey and face to face survey in the field have produced comparable results. However we also see that the wider range of coverage in telephone surveys enables a broader perspective to be established, whereas face to face interviews in a shorter time period yield more region specific and immediate information which may be more accurate with respect to short term recall.

The business survey was an attempt to cross check the estimates from the telephone and field surveys and to trace expenditure in as much as is possible. The business survey was fundamentally different and indicated that tracing recreational fisher expenditure through businesses may require more information on the identity of customers than is currently recorded by businesses. All three survey methods complement and help validate each other.

A major implication of this study is the need to maintain the trout fishery in the Snowy region and that strategies could be put in place to increase the expenditure derived from the trout fishers and the fishery. The trout fishery adds to the annual income of many different businesses and there must be incentives for business and government to examine strategies to maintain and increase the value of the fishery to the community. This survey has contributed to this process by bench marking the expenditure of fishers in the year 2000.

6.0 Overall conclusions from the study

This study presents the first estimates of recreational trout fishing expenditure in the Snowy Mountains region and illustrates how a fishing sector or region can be surveyed for expenditure and contribution to a local economy.

A telephone survey sampled one percent of recreational fishing licence records and extracted available information on the location of holders of the FWRFL in the 1998-98 period. The sampled holders were then telephone surveyed and Part A of the report documents the characteristics and fishing activities of the sampled recreational fishers.

The results show that freshwater recreational fishing is very popular throughout NSW and across a range of areas and species. Inland native fish proved to be fished by more people than trout, though the trout fishery in the south of NSW was one of the major freshwater fisheries in the State.

The survey showed that small scale stratified random sampling was a useful way to obtain information on recreational fishers and to monitor use patterns among fishers and even interstate visitation rates. Further random stratified samples of RFL holders could be taken and other segments of the freshwater angling sector investigated.

The telephone survey estimates were verified by two other independent surveys. The first sought to interview recreational trout fishers in the Snowy by face to face interviews and the second estimated expenditures by recreational fishers in the Snowy region by interviewing businesses for which fishing was a major component.

The study found certain differences among the three approaches, but also noted their complementary nature in appraising the diversity that surrounds recreational trout fishing in this region.

The results confirm that the recreational trout fishery generates significant economic expenditure in the Snowy region estimated at \$46.5m per annum. This would translate to between 450 and 700 jobs associated with, or derived from recreational trout fishing in the region.

The trout fishing industry also contributes to the gross income of many businesses such as caravan parks, where, although the main income is derived from skiing, fishing is a stable income source in the non-skiing months.

The recreational trout fishery depends on good biological management of the trout stocks and the provision of good recreational fishing opportunities and facilities. This study has indicated that the well being of the Snowy Community also depends to a significant extent on the sound management of the trout fishery and the development of strategies to maintain and increase the regional economic contribution attributable to the trout fishery.

Recreational fishing expenditure in the region is substantial and is a significant contributor to the Snowy Mountains business community. The trout fishery adds to the annual income of many different businesses and there must be incentives for businesses and government at all levels to examine strategies to maintain and increase the value of the fishery to the community.

There is a need for close monitoring of the fishery and for management to maximize the health and sustainability of the recreational fishery. Expenditure of fishers is probably related to catch expectations of anglers, and poor perceptions may translate into reduced visits by anglers and less expenditure in the region.

This study provides statewide freshwater fishing information and trout fishing activity estimates for the Snowy Mountain trout fishery. Estimates of expenditure are presented and it is hoped that the results will assist businesses and management in maintaining and improving the benefits from the trout fishery to the Snowy Mountains region.

References

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Appendices

Appendix 1: Derivation of Postcode Regions

Each of our postcode regions was constructed from one or more of the sorting divisions of Australia Post's presort plan (as found in the "Print Post Service Guide" October 1999 Edition), as shown in the following table.

State	Postcode Region	Aust. Post Sorting Divisions
NSW	ACT Sydney Sydney Sydney Sydney Sydney Sydney Hunter & C. Coast Hunter & C. Coast Western NSW Western NSW Western NSW New England N Coast NSW N Coast NSW N Coast NSW S Coast Southern Southern Southern	ACT - Canberra Mail Centre City Street Delivery Centre, Sydney East Letters Facility, Sydney North Letters Facility North Western Suburbs Mail Centre South Western Suburbs Mail Centre Southern Suburbs Mail Centre Central Coast Hunter Region Central West Western Plains Broken Hill New England Gold Coast Region (NSW Postcodes) Northern Rivers Mid North Coast South Coast Murray Region Riverina Bendigo (NSW Postcodes)
Vic	Melbourne Melbourne Melbourne Melbourne Melbourne Melbourne Melbourne Geelong Ballarat Bendigo Seymour Gippsland	City Mail Centre Western Suburbs Northern Suburbs Eastern Mail Centre South East Mail Centre Southern Mail Centre Southern Mail Centre (Fwd) Geelong Ballarat Bendigo Seymour Gippsland
QLD	Brisbane Brisbane Goldcoast Toowoomba Sunshine C. Rockhampton Townsville	Northgate Underwood Goldcoast Toowoomba Sunshine C. Rockhampton Townsville
SA	Adelaide Far Country - SA Near Country - SA	Adelaide Subs Far Country - SA Near Country - SA
NT	Darwin	Darwin
WA	NE Subs - WA North West - WA	NE Subs - WA North West - WA

Appendix 2: Comparisons of expenditure with available tourism data.

The Bureau of Tourism Research, Australia (BTR, 2000) has released regional tourism expenditure estimates for the 1998 calendar year for the Snowy Mountains region as reported in Tables A1a b and c below.

The BTR survey estimates that 1.7 million people visited the Snowy Mountains in 1998, 38% (647,000) were overnight visitors and 62% (1,068,000) were day visitors (Table 6a). These people visited for a total of 3,462,000 days, overnight visitors were 69% of visitor days, and day visitors 31% (Table A1a).

Total expenditure was \$332 million dollars, averaging \$96 per day (\$194 per visit -excluding airfares, other long distance fares and packages -Table A1b). Overnight visitors spent 84% of this total and day visitors 16%, although overnight visitors average expenditure was \$118/day, whereas day visitors average expenditure was \$32/day.

Table A2 reports a comparison of Tourism estimates from BTR (2000) for 1998 and estimates from the current Snowy Mountain Economic Survey (SMES). Of the 1.7 million estimated visitors to the Snowy Mountains region in 1998, between 2% and 5% were recreational fishers (34,000, SMES and 94,000, BTR). These fishers stayed 337,000 to 386,000 days, which was 10% to 11% of the total days visited.

A high percentage of fishers were overnight visitors. Overnight fisher visitors were 4% to 14% of the 647,000 overnight visitors to the Snowy Mountains (27,825 to 90,000 Table A2a).

Overnighting fishers also stayed considerably longer than the average visitor to the Snowy Mountains, who visited for an average of 3.7 days, compared with an average overnight stay of 13.3 days for fishers (SMES). Table A2b which reports that fishers spent 330,000 to 369,000 visitor days in the Snowy Mountains (14% to 15% of the BTR total) and of the 1.1 million estimated day visitors to the Snowy Mountains region in 1998, less than 1% (4,000 to 6,000) were fishers.

Table A1a: Visitor Numbers to the Snowy Mountain region (BTR, 2000)

	Visitors		Days		Visit (days)
Day Visitors*	1,068,000	62%	1,068,000	31%	1
Overnight Visitors	647,000	38%	2,393,900	69%	3.7
Total Visitors	1,715,000	100%	3,461,900	100%	2.0

Table A1b: Adjusted Visitor Expenditure (excluding airfares, other long distance fares and packages)

	Expenditure (\$million)		Expenditure per day (\$)		Expenditure per visit (\$)	
Day Visitors*	53	16%	32	27%	32	7%
Overnight Visitors	279	84%	118	100%	437	100%
Total Expenditure	332	100%	96		194	

* Day Visitor figures were calculated from Snowy and Capital Country figures.

Table A2a: Visitors to Snowy Mountains region in 1998.

	Visitors to SM				
	Total (BTR)	Fishers (BTR)	Fishers (BTR) as % of Total	Fishers (SMES)	Fishers (SMES) as % of Total
Day visitors	1,068,000	4,000	0%	6,022	1%
Overnight visitors	647,000	90,000*	14%	27,825	4%
Total	1,715,000	94,000	5%	33,847	2%
	Visitor Days in SM				
	Total (BTR)	Fishers (BTR)	Fishers (BTR) as % of Total	Fishers (SMES)	Fishers (SMES) as % of Total
Day visitors	1,068,000	4,000	0%	16,646	2%
Overnight visitors	2,393,900	333,000**	14% **	369,091	15%
Total	3,461,900	337,000	10%	385,737	11%

*14% of visitor total to Snowy Mountains

Table A2b: Visitor annual expenditure and fishing in the Snowy Mountains region in 1998

	Total (BTR)	Fishers (SMES)	Fishers (SMES) as % of Total
Annual Expenditure (\$million/yr)			
Day visitors	\$ 53	\$ 0.7	1%
Overnight visitors	\$ 279	\$ 45.7	16%
Total	\$ 332	\$ 46.4	14%
Ave Expenditure (\$/day)			
Day visitors	\$ 38	\$ 42	115%
Overnight visitors	\$ 135	\$ 124	83%
All visitors	\$ 96	\$ 120	104%

The expenditure of fishers in comparison to tourist expenditure in the Snowy Mountain region is reported in Table A2a and b. The data are estimates only and should be interpreted with caution due to the weighting estimates used.

Of the \$332 million estimated visitor expenditure in the Snowy Mountains region in 1998, \$46.4 million (14%) was spent by visiting fishers. The average fishing visitor spent an average of \$96 per day, while fishers averaged \$120 per day.

Overnight fishing visitors spent \$45.7 million (16.4%) of the \$279 million spent by overnight visitors. This represents an average of \$124 per day for overnighting fisher visitors.

Day fishing visitors spent \$0.7 million (1.2%) of the \$53 million spent by day visitors. This represents an average of \$42 per day for day fisher visitors.

In summary, although fishers comprise only 1% to 4% of visitor numbers to the Snowy Mountains, they contribute 2% of day visits and up to 15% of all overnights in the Snowy. In total recreational fishers expend approximately 14% of all visitor expenditure in the region. They spend slightly more per day than other day trippers and less average expenditure per overnight but they tend to stay longer and spend more total per overnight visitor than the average visitor to the Snowy.