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Social assessment of commercial fishing in the East Gippsland region

*Report of a case study conducted as part of the 'Social
Assessment Handbook for the Australian fishing sector'
project*

June 2005

Jacki Schirmer and Julia Pickworth

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The Fisheries Research and Development Corporation plans, invests in and manages fisheries research and development throughout Australia. It is a statutory authority within the portfolio of the federal Minister for Agriculture, Fisheries and Forestry, jointly funded by the Australian Government and the fishing industry.

Executive summary

Overview

This report provides results of a study examining the social well-being of people working in commercial fishing in the East Gippsland region and their impacts on the East Gippsland region. A diverse range of fishers operate in both the inland and ocean waters in and around East Gippsland, and catch is landed in the region from many fisheries.

Methods

This study gathered data primarily via a mail questionnaire distributed to all fishers landing catch into the two key fishing co-operatives in the region – the Lakes Entrance Fisherman’s Cooperative Ltd (LEFCOL), the Eastern Zone Abalone Industry Association (EZAIA) and the Abalone Fishing Cooperative Ltd (AFCL). Surveys were distributed to (a) fishing co-operative employees, (b) fishing business owners and managers, including abalone access holders and operators, and (c) crew members of fishing businesses.

An overall response rate of approximately 36.6% was achieved, with higher rates of return from co-operative employees and abalone access holders and operators than other groups. Importantly, data was gathered from some parts of the fishing community who have rarely been included in previous studies – particularly crew members and fishing co-operative employees.

Key results

The key findings of this report are that fishers in the region generally have a high quality of life, but this high quality of life is under pressure as a result of a number of external pressures affecting fishing businesses. These include rising operating expenses, uncertainty about the future of fishing, and changes to regulation of fishing. Levels of satisfaction with fishing work are significantly related to the overall well-being of those working in fishing.

The most important aspects of work affecting overall well-being are the extent to which fishers feel they have long-term job security, a good balance between work and home life, and fair management of fishing. The nature of the tasks undertaken is also very important, with fishers identifying that the stimulation and challenge of fishing work is very important to them. Achieving a high income was important to most fishers, but for fewer than the dimensions of fishing work listed above.

There is evidence of intergenerational change occurring in who enters the fishing industry and how they learn their fishing skills. Those who undertake catching of seafood are more likely to report intergenerational involvement in fishing than co-operative employees. However, younger fishers are less likely to have a family history of involvement in fishing, indicating a shift away from traditional patterns of family involvement in fishing. Younger fishers were also more likely to report learning their fishing skills from working in fishing businesses not run by a family member, whereas older fishers were more likely to have learned their skills from a family member.

The commercial fishing sector is a significant contributor to the East Gippsland community. Due to low reporting of financial details of fishing businesses by survey respondents, this report could not estimate total levels of expenditure by the fishing sector in the region but an average level of spending per fishing business was calculated. Fishing businesses support a

large number of employees in the region who work in fishing, fish processing and provision of goods and services to fishing businesses.

There were key differences between different types of fishing businesses. Lake fishing businesses reported generally lower gross sales and capital value of their businesses than ocean fishing and abalone businesses, while abalone businesses reported the highest average gross sales and capital values. All businesses reported purchasing a high proportion of the inputs required to run their businesses within East Gippsland, indicating a high proportion of economic activity is generated in the local region from the sector.

Key characteristics of those working in the fishing sector in East Gippsland are presented in the following tables.

Social profile of commercial fishing sector participants in East Gippsland

Average age of survey respondents	Fishing business owners and managers ¹ : 47.2 Crew members (all fisheries): 33.8 Co-operative employees: 42.1
Gender of survey respondents	Owners and managers: 100% male Paid employees: Mostly male Unpaid employees: Mostly female Co-operative employees: 65.4% male, 34.6% female
Average number of dependents (eg children, elderly relatives) per respondent	1.7 per person (across all survey respondents)
Highest level of formal education achieved	6.3% Primary school 48.8% Fourth year of high school 27.5% High school certificate 17.6% achieved qualifications beyond high school

Fishing profile of commercial fishing sector participants in East Gippsland

	Co-operative employees	Owners and managers	Crew members
Average years spent working in the commercial fishing sector	9.7 years	24.2 years	14 years
Percent who are the first generation of their family to have worked in fishing	84%	34.2%	56.3%
Percent whose family have been involved in fishing for two or more generations	16%	65.8%	43.8%
Most common methods of acquiring fishing skills	N/A	Learning from family members and experience fishing	Learning from other fishers
Average proportion of household income reported to be derived from	79.0%	88.4%	86.7%

¹ The term 'fishing business owners and managers' or 'owners and managers' includes both lake, ocean and abalone business owners and managers, and includes abalone access holders and operators unless otherwise specified

work in the fishing sector			
Percent who had a member of their household working outside the fishing sector	65.4%	61.5%	55.5%

Profile of fishing businesses landing catch in East Gippsland

	All fishing businesses	Abalone businesses	Lake and ocean fishing businesses (not including abalone businesses)
Average gross sales in financial year 2003-04	\$489,500	\$561,500	\$401,500
Average fishing business expenditure within East Gippsland in financial year 2003-04 (excluding licence and quota payments)	\$206,500	\$169,000	\$221,000
Average fishing business expenditure outside East Gippsland in financial year 2003-04 (excluding licence and quota payments)	\$61,000	\$69,000	\$41,500
Average number of paid full-time employees in financial year 2003-04	2.3	2.3	Lake fishers: 1.0 Ocean fishers: 1.0
Average number of paid part-time employees in financial year 2003-04	7.7	14.3	Lake fishers: 1.0 Ocean fishers: 3.7

Acknowledgments

The authors would like to thank all the people who completed surveys and attended workshops; those who helped design the survey and encouraged others to complete it, particularly at LEFCOL, the Eastern Zone Abalone Industry Association (EZAIA), and AFCL; and the Fisheries Research and Development Corporation for funding the study.

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We would also like to thank those who contributed their time and energy to helping design survey questions, and helping us identify ways of contacting those in the fishing community. In particular, we would like to thank Peter Clarke, Ian Robinson, Tony Guarnaccia and Jeff North for their assistance in reviewing initial drafts of the questionnaire; the staff at LEFCOL, particularly Merriann, for their ongoing assistance and work distributing the survey; and Alan Taylor of the East Gippsland Abalone Industry Association (EZAIA) and Alex Ziolkowski of the Abalone Fishing Co-operative Limited (AFCL) for their considerable time spent helping comment on and distribute surveys.

This case study forms part of the larger project *Social Assessment Handbook for Australian Fisheries*, which was advised by the Fisheries Research and Development Corporation's ESD Subprogram Working Group and Reference Group. Their input and advice was greatly appreciated throughout the project.

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Introduction

In recent years, understanding the social side of fisheries and fishing industries has become increasingly important, particularly as part of processes reporting on ecologically sustainable development. Improved understanding of the communities directly and indirectly dependent on fishing and fishing industries, their quality of life, and the values and attitudes of different groups towards fishing, can help decision-makers identify and communicate the importance of fishing activities, improve quality of life for fishing communities, and develop responses to particular issues.

This report presents results of one of the two case studies undertaken as part of the *Social Assessment Handbook for Australian Fisheries* project. The goals of the overall project were to develop best practice advice on approaches to designing and undertaking social assessments in the Australian fishing sector. The project was funded by the Fisheries Research and Development Corporation.

The findings of this case study and a second case study of the Marine Scalefish Fishery in South Australia (Schirmer and Pickworth 2005) were used in the development of the *Social Assessment Handbook: A guide to methods and approaches for assessing the social sustainability of fisheries in Australia* (Schirmer and Casey 2005). The Handbook provides a guide to undertaking a rigorous social assessment, including an overview of the different types and levels of social assessment that can meet a range of needs, and methods appropriate to a range of time and resource constraints. The Handbook also provides a guide to assessing social assessment proposals and reports.

This case study reports on a social assessment of commercial fishing in East Gippsland, Victoria. This region was an ideal case study for testing methods of social assessment as a diverse range of fishers land catch in the region.

The goals of this case study were to provide an assessment of the well-being of those working in commercial fishing and their contributions to the broader community, as well as to test proposed social assessment methods and evaluate their appropriateness and effectiveness. This report primarily presents results related to the well-being and contributions of those working in commercial fishing, while the results related to methods for social assessment are provided in Appendix 1 and in the *Social Assessment Handbook*.

Overview of commercial fishing activities in East Gippsland

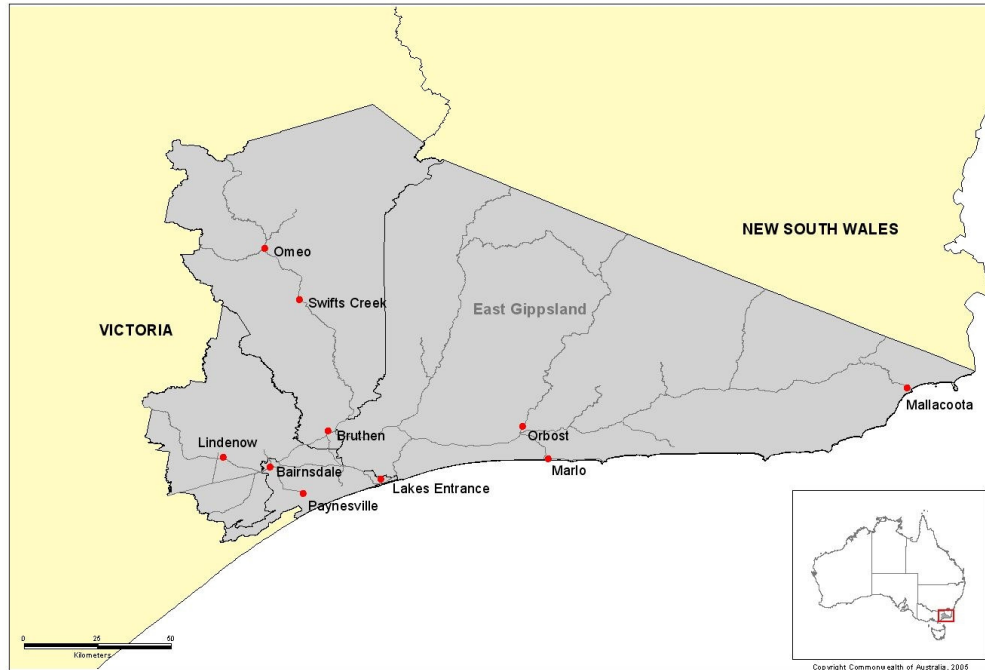


Figure 1: East Gippsland

The East Gippsland region, shown in Figure 1, covers the south eastern corner of the main continent of Australia. This coastal region is unique in that it contains the Gippsland Lakes – ‘a sweep of lakes, rivers, estuaries and inlets spreading along the south eastern coast of Australia’ (Ellis and Lee 2002: 2).

Commercial fishing activities have been undertaken in the East Gippsland region by Europeans since the late 1800s, and many towns in the region originally developed to support the fishing activities undertaken there. Much commercial fishing in early years appears to have taken place in the Gippsland Lakes, with less ocean fishing occurring. By the 1880s, the lakes fishery was based around Lakes Entrance but fishers worked many areas including Paynesville and Mallacoota Inlet (Ellis and Lee 2002). However, transport of catch to key markets was problematic before ice became available around 1890.

In the late 1800s, an artificial entrance was created between the ocean and the lakes system. Work on the entrance began in 1869 but suffered several setbacks before the entrance was finally opened in 1889. The Government encouraged lake fishers already operating in the region to use the entrance to undertake ocean fishing (Ellis and Lee 2002: 12-13)².

Considerable commercial fishing activity has occurred in the region from this time, including both lake and ocean fishing, with catch landed at points including Lakes Entrance and

² Because this study focussed on commercial fishing, this background section provides information on the history and management of the commercial fishing sector in the region but not the recreational sector. Considerable recreational fishing also occurs in the region.

Mallacoota in the region. In 1956, the Victorian Fishermen's Co-operative, later named the Lakes Entrance Fishermen's Cooperative Limited (LEFCOL), was established, and

By 1976 there were more than 100 boats at Lakes Entrance, including trawlers, scallop dredges and abalone boats, using Danish seine, long line, trolling, dredges and netting (Ellis and Lee 2002: 14).

Many fishing families in the area have reportedly worked in fishing for several generations in the area, with stories of some of these families documented by Ellis and Lee (2002). Seevers (2004) similarly documents some of the rich history of fishing over generations by families based in the region. Minnegal *et al.* (2003), however, found that while many fishers refer to high levels of inter-generational involvement in fishing, many of the fishers they talked to as part of their study did not actually have a long family involvement in the fishing industry.

The fishers landing catch in East Gippsland operate in a complex set of fisheries managed under a range of jurisdictions. Many fishers hold licences to fish in several fisheries, managed by State and/or Commonwealth authorities. The Victorian fisheries include the abalone, rock lobster and giant crab, scallop and commercial bays and inlets fisheries. The Commonwealth fisheries include the south east trawl and non trawl and southern shark fisheries.

There is considerable evidence that fishers in the region are experiencing a range of stresses, including competition and conflict with recreational fishers, and pressures from changing management of the various fisheries they operate in (e.g. Minnegal *et al.* 2003, Ellis and Lee 2002).

Methods summary

This section provides a brief summary of the methods used in this project. A detailed overview of the methods used is provided in Appendix 1, which includes an evaluation of the effectiveness of the methods used.

Data was gathered for this study using a questionnaire that was distributed to fishing business owners and managers, crew members and fish co-operative employees in the East Gippsland region. Separate questionnaires were designed for (a) business owners and managers, (b) crew members and (c) fish co-operative employees. While all three surveys contained many identical questions, business owners and managers were asked for details of their fishing business expenditure, employment and factors affecting their business viability in addition to the questions asked of other respondents.

The surveys asked questions about:

- Satisfaction with life;
- Satisfaction with work;
- Health problems and health risks related to fishing work;
- Services and networks available and utilised in the local community;
- Services and networks in the fishing community;
- Household spending and income;
- Types of fishing work undertaken;
- Plans for future in fishing (not asked of co-operative employees); and
- Demographic information (gender, age, education).

A list of survey questions is included in Appendix 2.

Questionnaires were distributed in late 2004 via the Lakes Entrance Fishing Cooperative Limited (LEFCOL), the Abalone Fishing Cooperative Limited (AFCL) and the Eastern Zone Abalone Industry Association (EZAIA). A total of approximately 235 surveys were distributed to those working in the fishing sector in the region³.

The response rate received was approximately 36.6% across all respondents, with a total of 84 valid survey responses received. The total population of those working in fishing in the region fluctuates over time, making it difficult to determine the total population of fishing sector employees in the region, and hence the response rate is given as approximate.

Survey response rates were high from the co-operative employees (68% across both co-operatives), while response rates from crew members were low at approximately 27% from

³ The number is approximate as in some cases skippers or fishing business owners distribute the survey to their crew members, and it was not possible to confirm for all businesses the exact number of crew members surveys were distributed to.

abalone business crew members and 15% from other fishing business crew members. Approximately 43% of abalone access holders and operators (referred to as business owners and managers through the rest of this reports) returned surveys, while 30% of other fishing business owners and managers responded.

Because the response rate from some sectors was low, and many respondents did not provide financial data, the study was limited in the extent to which it could provide estimates of spending by the fishing sector in East Gippsland.

Distributing surveys to fishers via the fish co-operative took considerable time due to fishing businesses often landing catch at the co-operatives infrequently. It also failed to achieve a high response rate, possibly because fishers were not receiving regular reminders via mail to complete the survey, and were only reminded of the survey when they landed catch at or contacted the co-operative for other purposes. Distributing surveys to those working in or owning abalone businesses via EZAIA was more effective, resulting in a high response rate in a relatively short time frame. It is recommended that where possible surveys be distributed via fishing representative associations, rather than fish co-operatives.

Results

The results of the study are presented in two parts. First, overall results on the demographics and well-being of those working in the commercial fishing sector in the region are presented by topic.

The second part examines the contributions of the commercial fishing sector to the region, as well as details of key socio-demographics characteristics of the region which may impact on the well-being of those who work in the sector.

The relationships identified and discussed throughout this report are strong and statistically significant at the $p \leq 0.05$ level. The p values are included throughout the report. Further statistical information is available upon request.

Social characteristics and well-being of people working in the commercial fishing sector

This section presents results relating to the demographic characteristics and the well-being of people working in the commercial fishing sector in East Gippsland – defined as those landing catch to fish co-operatives in the region, as well as those working at the co-operatives.

The results of the survey and workshops are presented in several sections below, which provide information on the:

- demographic profile of those working in the commercial fishing sector;
- level of satisfaction with life in general;
- level of satisfaction with different aspects of work in commercial fishing;
- health problems and perceived risks involved in fishing work;
- social capital available to those working in fishing (focusing on formal and informal networks related to family and friends, fishing community, local community and broader community);
- household spending patterns;
- history of involvement in the fishing sector including the types of work undertaken, length of involvement in the sector, and methods by which fishing skills have been developed;
- fishing business profiles including business size, expenditure, gross sales and number of employees;
- changes affecting fishing business viability; and
- perceptions of difficulties of entering fishing and the future plans of crew members with regard to their fishing work.

Demographic profile of respondents

Age

The age of respondents to the questionnaire varied from 19 to 66 years of age, with an average age of 42.8 years. The variation in age of respondents is shown in Figure 1.

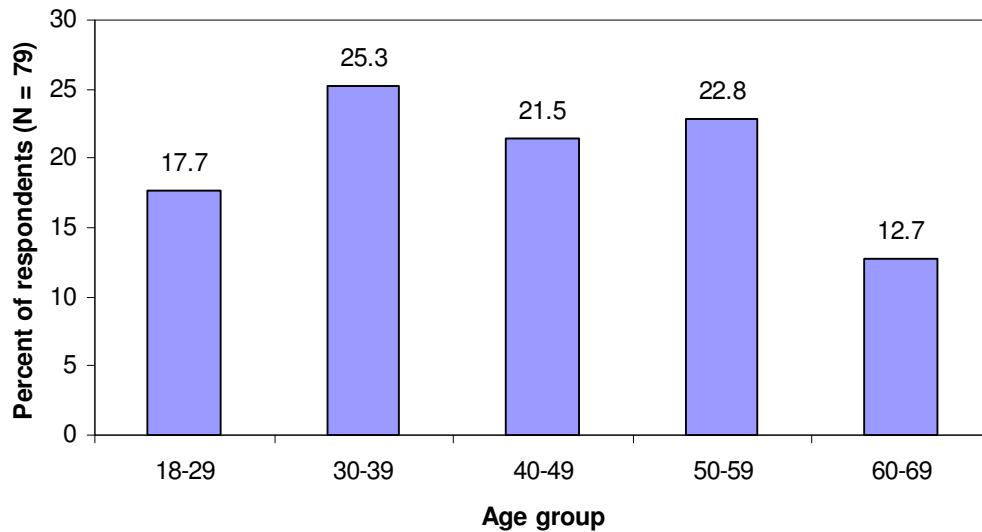


Figure 2: Age distribution of survey respondents

There was a statistically significant difference in the ages of those undertaking different types of work ($p = 0.031$). Fishing business owners were older on average than co-operative employees, while crew members tended to be younger than either owners/managers or co-operative employees, as shown in Figure 2.

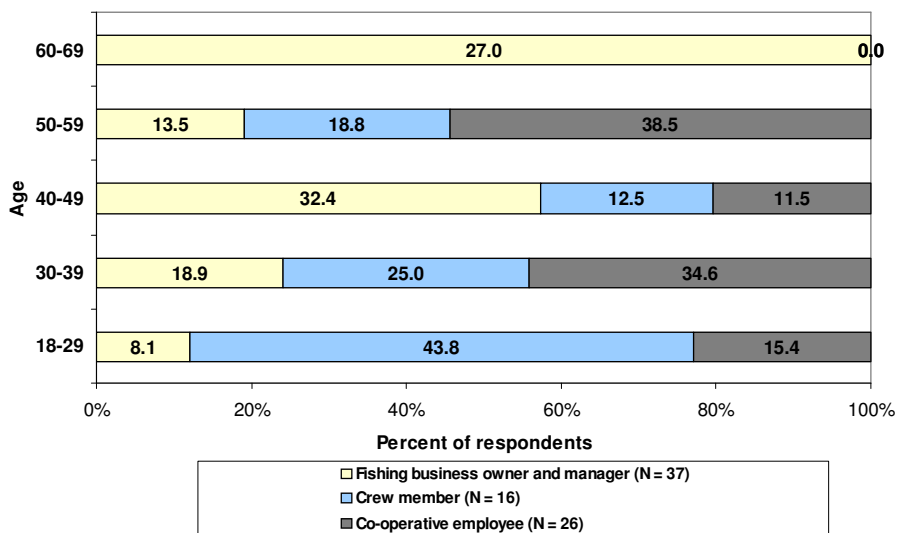


Figure 2: Age distribution of different types of respondents

Gender

All but two respondents provided details of their gender, with 89% of respondents male and 11% female. Of the fish co-operative employees 65.4% were male and 34.6% female. All fishing business owner and manager and crew member respondents were male.

Marital status

The majority of respondents (67.1%) were currently married or in a de facto relationship, while 12.2% were separated, divorced or widowed, and 20.7% had never been in a de facto relationship or married.

Children and dependents

The majority of respondents had children, with an average of 1.8 children per respondent. Over a quarter of respondents (29.3%) were childless, while 41.3% had one or two children, and 30.4% had three or more children.

An average of one *dependent* child was reported per respondent. Just under half (48.8%) reported having no non-child dependents, with 51.2% reporting that they had one or more children dependent on them.

Many also reported having a dependent partner or other family members dependent on them, with a average of 1.7 dependents reported per respondent (including both children and other dependents).

Formal education

Less than half (45.1%) of respondents had formal education beyond fourth year high school. The highest level of formal education achieved by 6.3% of respondents was primary school, while 48.8% had achieved fourth year of high school, 27.5% their high school certificate, and 17.6% achieved qualifications beyond high school, as can be seen in Figure 3.

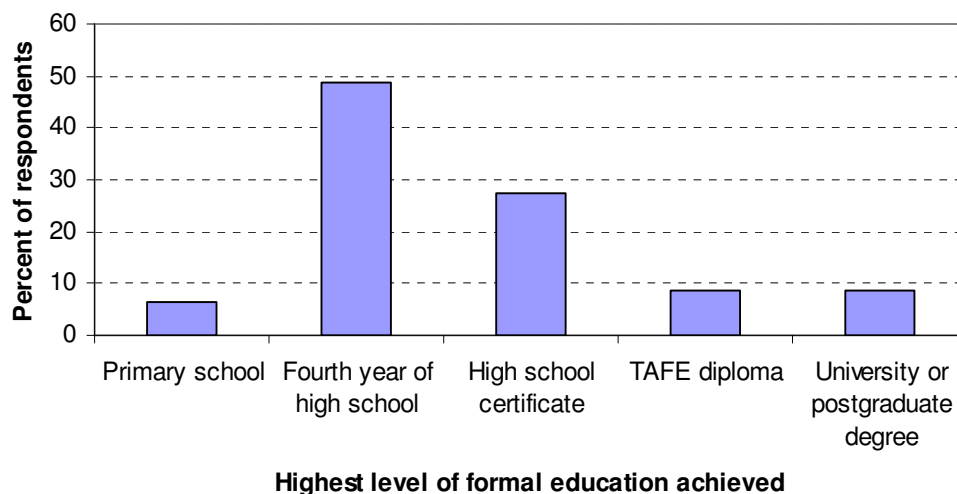


Figure 3: Highest level of formal education achieved by survey respondents

Household income

Figure 4 shows the household income reported by respondents. A wide distribution of income was reported across the respondents.

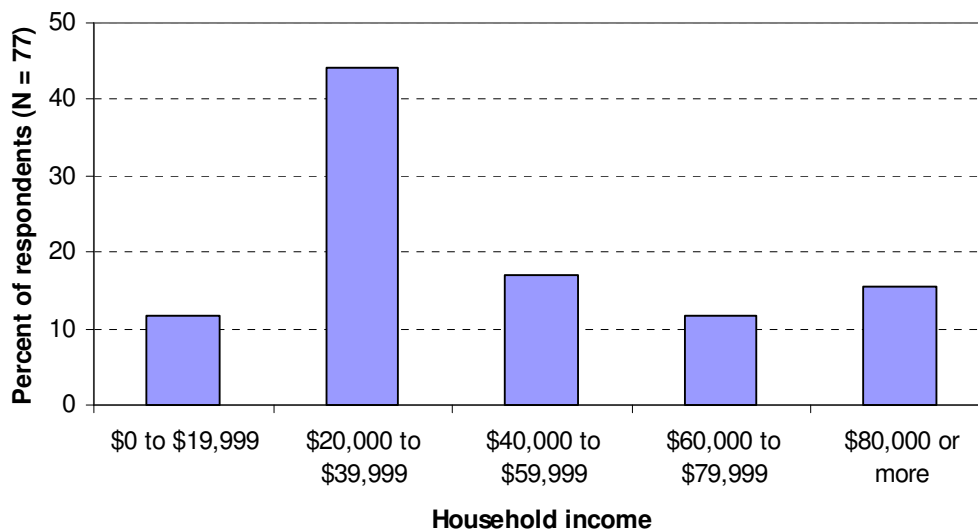


Figure 4: Household income of survey respondents in financial year 2003-04

Fishing business owners and managers reported significantly higher income than crew members or co-operative employees ($p < 0.001$). Amongst fishing business owners and managers, abalone business owners and managers reported significantly higher household income than other fishers ($p = 0.002$).

Respondents who reported intergenerational involvement of their family in fishing reported significantly higher income than those who were the first of their family to work in fishing ($p = 0.018$). This may reflect that fishing business owners and managers were more likely than crew members or co-operative employees to report intergenerational involvement in fishing.

Those who worked part-time reported significantly lower household income than those who worked full-time ($p < 0.001$).

Type of fishing

Respondents worked in various sectors of the industry, with:

- 2.4% in fishing businesses involving lake fishing
- 33.7% in ocean fishing including Danish seine, inshore trawl, scallop and shark fishing
- 32.5% in abalone businesses
- 31.3% in fish co-operatives (LEFCOL or AFCL)

Of the respondents:

- 47% were fishing business owners or managers;
- 21.7% were crew members working in fishing businesses; and
- 31.3% were co-operative employees.

Fishing business owners and managers and crew members reported a range of tasks including:

- 24 reported managing financial aspects of their fishing business (usually fishing business owners and managers);
- 27 reported managed non-financial aspects of the fishing business;
- 49 reporting undertaking fishing; and
- 11 reported that their job included transport of catch;

Similarly, co-operative employees undertook a range of tasks including:

- 9 reported undertaking administrative duties;
- 2 reported that they were involved in financial management duties;
- 4 were involved in transport of seafood;
- 15 were involved in processing of seafood;
- 2 were involved in sale of fishing gear or equipment; and
- 8 were involved in sale of seafood products.

Fishing business owners and managers were asked which fisheries they operated in. Of the respondents:

- 62.5% (including almost all abalone access holders and operators) held licences in Victorian fisheries only;
- 3.1% held only AFMA fishing licences;
- 25% held both AFMA and Victorian licences; and
- 9.4% held Victorian and AFMA licences and licences in fisheries in other jurisdictions (usually Tasmanian fisheries).

Life satisfaction

Respondents were asked to rate their satisfaction with five dimensions of their life – their life in general, their financial situation, their own health, their family’s health, and the local area they lived in. Figure 5 shows the results.

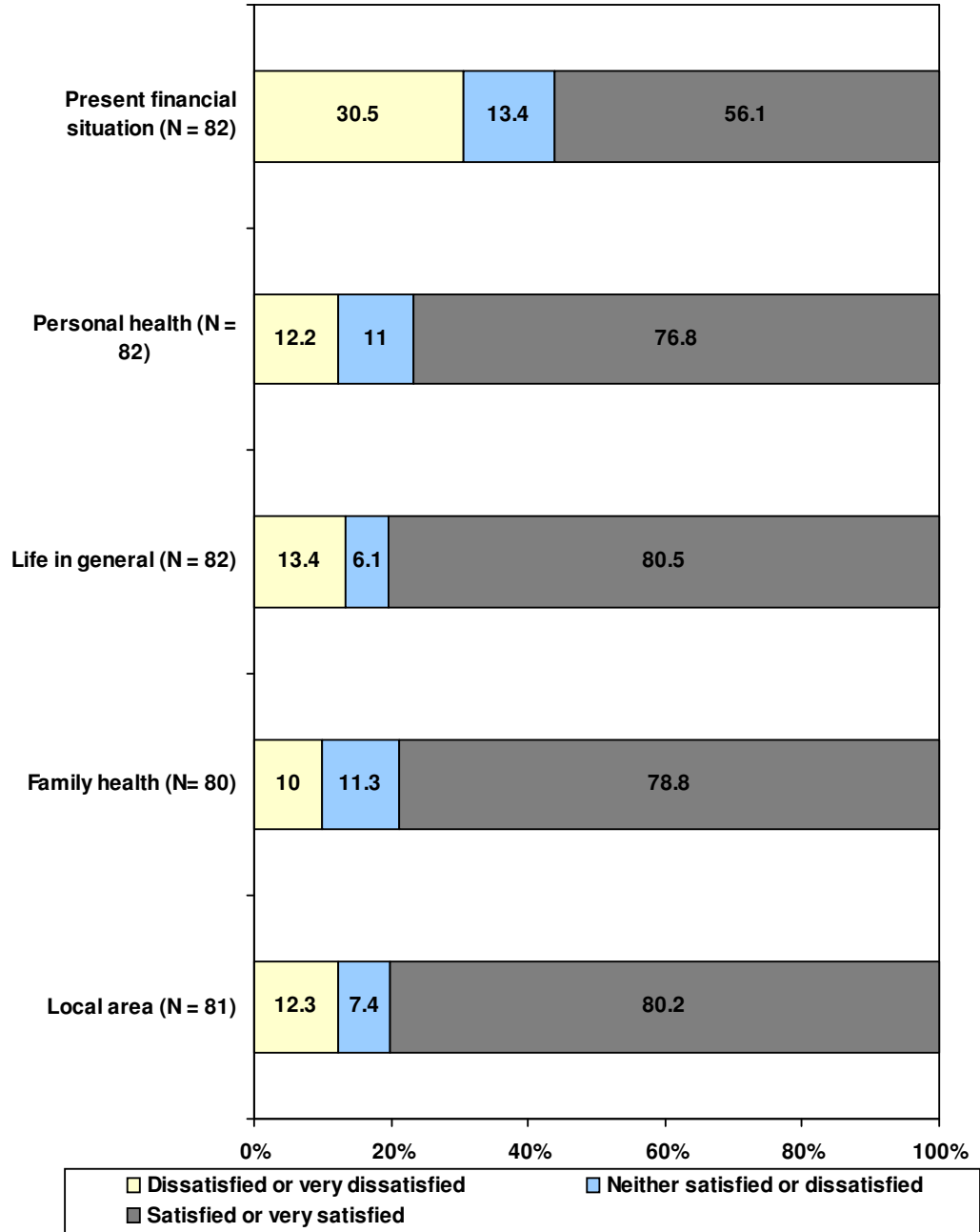


Figure 5: Respondents’ level of satisfaction with different aspects of their lives

The large majority of respondents were satisfied or very satisfied with their life, with the exception of their financial situation, where 56.1% were satisfied, while 30.5% were unsatisfied.

Overall, this showed a high general level of satisfaction with life in general, with the exception of respondents' financial situation, and even here a majority reported being satisfied or very satisfied. Satisfaction with life in general was strongly correlated with satisfaction with finances, with those who reported low satisfaction with their life also more likely to report low satisfaction with their overall finances ($p < 0.001$).

There was a significant difference in the level of satisfaction of fishing business owners and managers, crew members, and co-operative employees with their finances, as can be seen in Figure 6 ($p = 0.026$). Fishing business owners and managers reported higher satisfaction with their finances, while crew members reported the lowest levels of satisfaction.

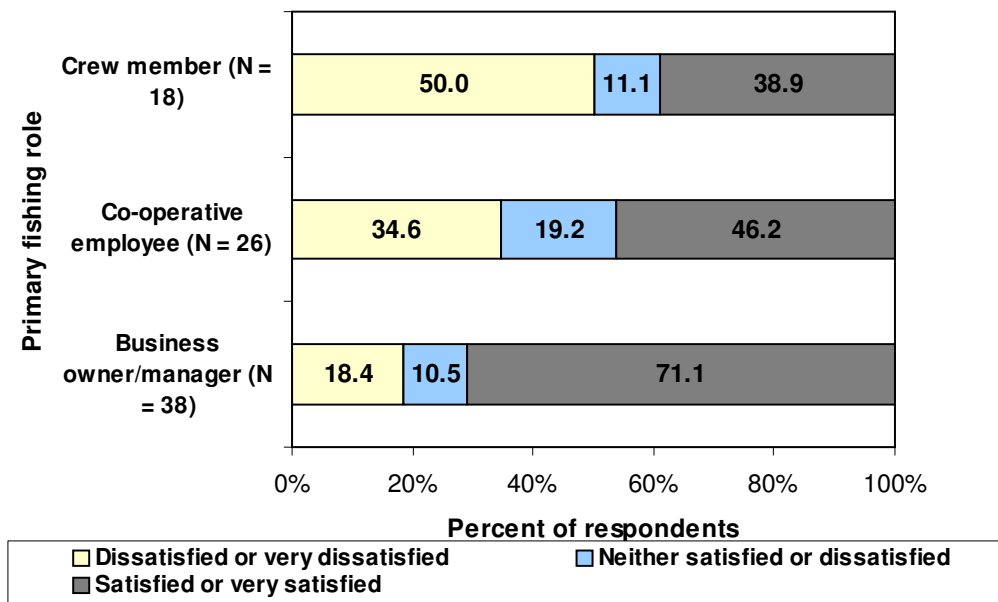


Figure 6: Level of satisfaction of different types of respondents with their current financial situation

Those who reported they were satisfied or very satisfied with their life in general were more likely to be satisfied or very satisfied with their work in fishing in general ($p = 0.002$). Part-time workers reported a higher satisfaction with their health than full-time workers ($p = 0.009$).

This presents a picture in which certain factors significantly contribute to an increased satisfaction with life overall. These factors include having positive perceptions of their local community, active links to their local community and having satisfying work.

Satisfaction with overall finances was separately tested against other variables, as responses to this question differed to the responses to other questions about life satisfaction. Higher overall satisfaction with their household financial situation was significantly related to:

- higher satisfaction with work in fishing ($p = 0.049$);

- lower likelihood of reporting experiencing health problems related to fishing ($p = 0.027$);
- higher likelihood of reporting membership of a community group ($p = 0.030$);
- respondents indicating they would encourage young people to enter fishing ($p = 0.050$);
- higher reported household income ($p < 0.001$); and
- higher satisfaction with health overall ($p = 0.001$).

Work satisfaction

Respondents were asked about (a) how important a range of aspects of their commercial fishing work were, and (b) how satisfied they were with a number of different aspects of their work in commercial fishing.

Important aspects of work in commercial fishing

Figure 7 shows respondent's ratings of the importance of different aspects of their work in commercial fishing and shows that a range of aspects are important to respondents. The most

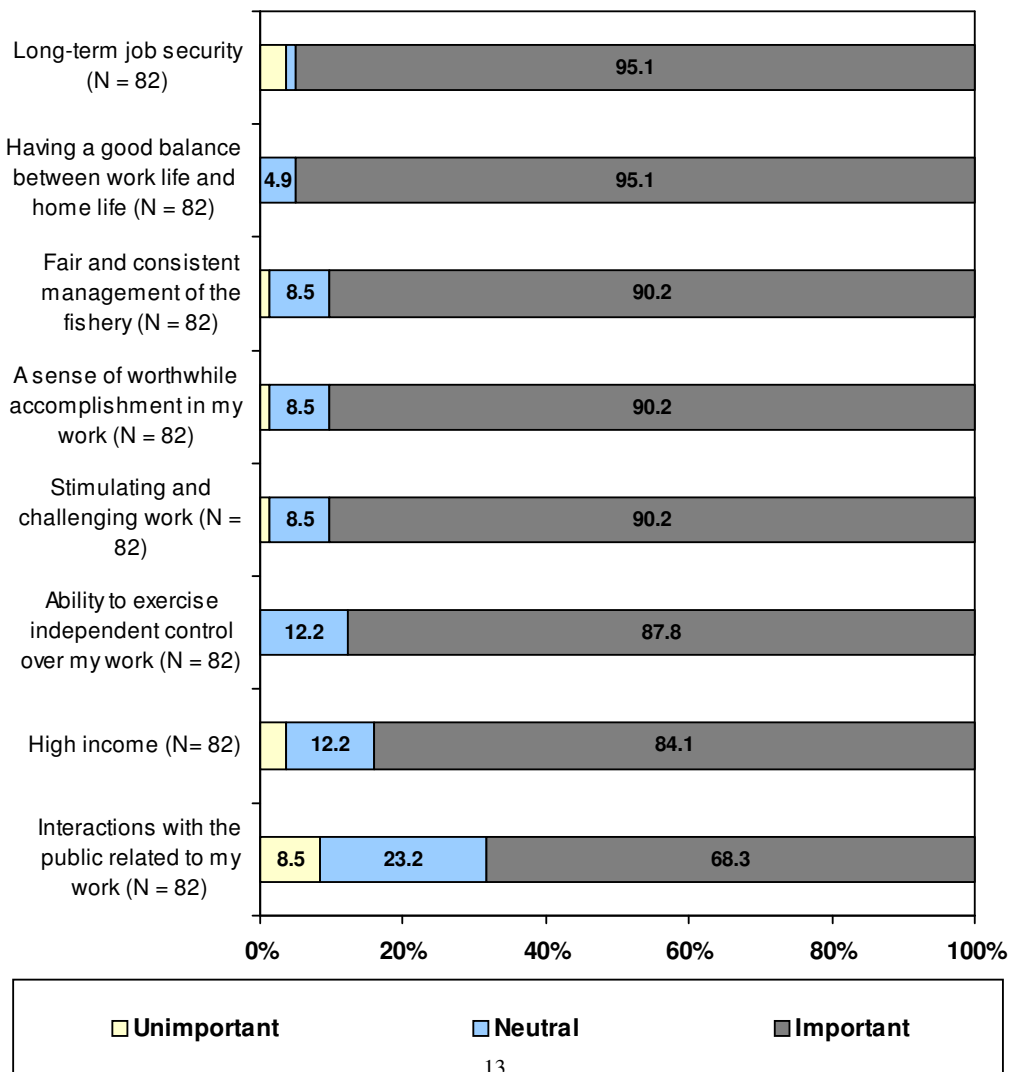


Figure 7: Respondents' ratings of the importance of different aspects of their fishing work

important aspects were long term job security, having a good balance between work and home life, fair and consistent management of the fishery, a sense of accomplishment in fishing work and stimulating and challenging work. These responses indicate a strong preference for stability in management of the fishery. Fewer respondents attached high importance to achieving high monetary returns from fishing and much lower numbers attached high levels of importance to positive interactions with the public.

Satisfaction with different aspects of work in commercial fishing

Figure 8 shows respondent's ratings of their satisfaction with a range of aspects of their work in commercial fishing. A majority of respondents were satisfied or very satisfied with the amount of challenge in their fishing work, the support and guidance they received from other people working in fishing, their work in commercial fishing overall, the sense of accomplishment achieved in their work and the freedom to choose their methods of working.

However, a majority were dissatisfied with the rules set by government on how commercial fishers can operate, fairness of decisions about management of commercial fishing and support received from bodies outside the fishing sector.

The questions asked about work satisfaction related to four main dimensions of fishing work:

- Satisfaction with the tasks involved in the work;
- Satisfaction with time spent working;
- Satisfaction with income; and
- Satisfaction with the management of commercial fishing by the government.

There was overall a higher level of satisfaction with the tasks involved in fishing than with other dimensions of fishing, and considerably lower satisfaction with the external influences affecting commercial fishing than the other three dimensions of fishing work.

This difference was emphasised in written comments on returned surveys, in which considerable concern was expressed about the external pressures on the fishing sector and perceptions of people outside the sector about commercial fishing:

I am deeply concerned about the state of fishery management in many different fisheries. I feel that we are filling out too much paper work and we are providing the same information several times over in some cases. ... Fishermen are not listened to at all when they raise concerns about both the state of fish stocks and incompetent fishery management as a whole.
– Crew member

I have great concern for the future of commercial fishing as in my area we have no young people wanting to become commercial fishers, the reason being there is no guarantee of secure employment. I also believe the general public needs to be educated on how the commercial fleet operate and what restrictions we are guided by – Fishing business owner/manager

The politics of fishing will eventually force me out of the industry. Government people that make decisions that affect our work are sitting in an office and it is unlikely they have ever been on a fishing boat. ... In general the local community does not support the fishing industry. In my opinion the fishing and tourism industries should be run hand in hand. There are a lot of tourists interested in the commercial fishing industry that the tourism industry does not see or seem to acknowledge. – Fishing business owner/manager

Unfortunately our fishing industry during the last 10 years has gone from being under-regulated to grossly over-regulated. Our Commonwealth regulatory body has absolutely no idea or concept of the impact their decisions are making on both the financial viability of commercial fishing and the declining fish stocks. I'm afraid I am not very confident of still having employment in the fishing industry in another five year's time! – Co-operative employee

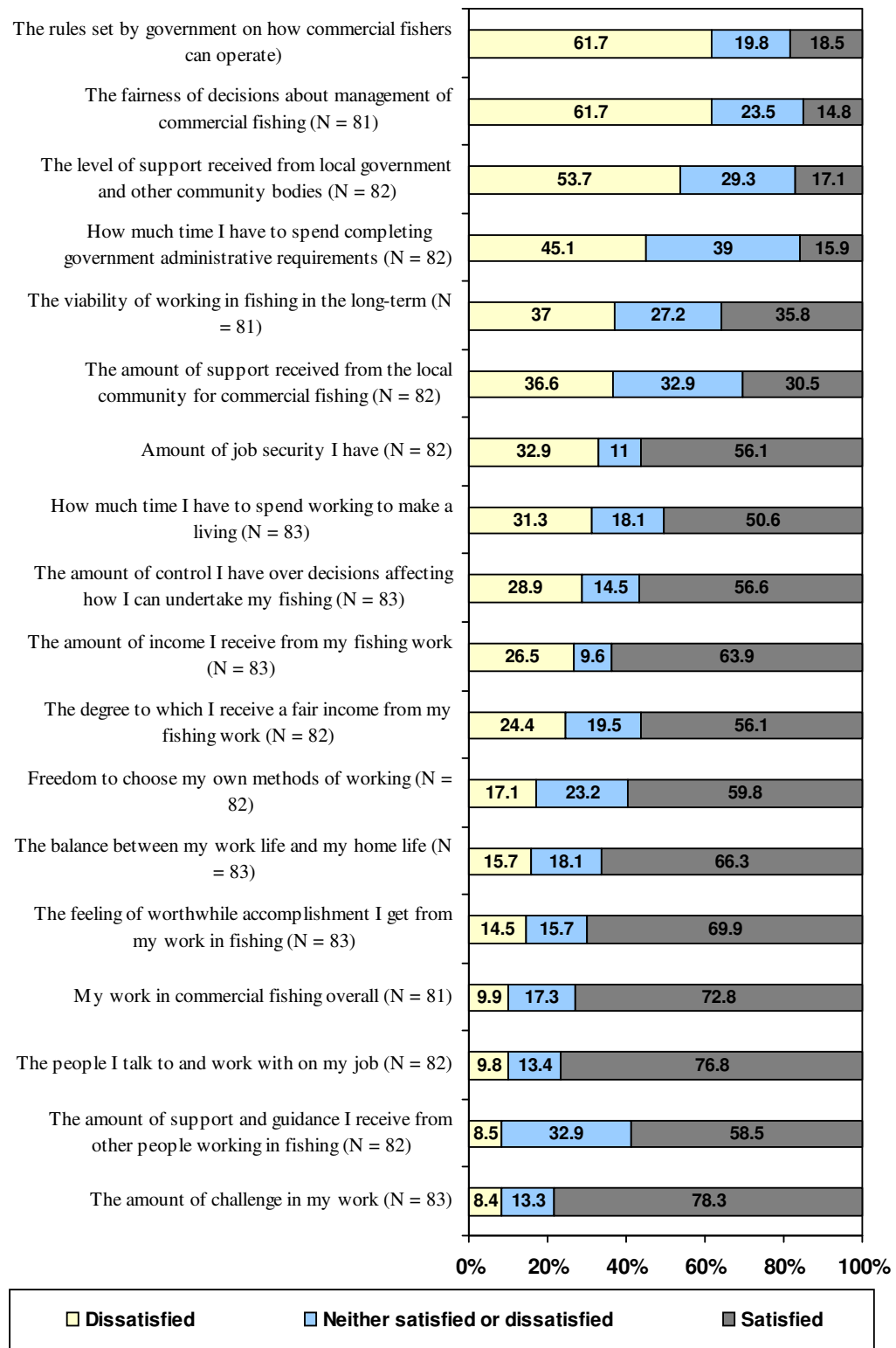


Figure 8: Respondents' level of satisfaction with different aspects of their fishing

Health issues and work risks

Health problems experienced

Respondents were asked to identify whether they had experienced any health problems related to their work over the past year and, if they had, to describe the problems. Of 77 respondents, 36.4% had experienced a health problem related to their work in the past year, while 63.6% indicated they had not experienced health problems related to their work.

Of those who had experienced health problems, the most common problems reported were:

- Back problems (13 respondents);
- Joint, ligament and muscle injuries including arthritis (7 respondents);
- Diving related problems for abalone divers (3 respondents);
- High blood pressure (2 respondents); and
- A range of other health problems (8 respondents).

In their description of health problems two respondents stated that their health problems related to injuries sustained some years ago in their fishing work, and one commented that the introduction of better equipment such as hydraulic winders had reduced the incidence of injuries such as the one that had led to ongoing health problems for him.

There was a significant difference in the proportion of fishing business owners and managers, crew members, and co-operative employees reporting they had experienced health problems ($p = 0.001$). The differences are shown in Figure 9. Very few co-operative employees reported experiencing health problems, while fishing business owners and managers were most likely to report experiencing health problems related to their work.

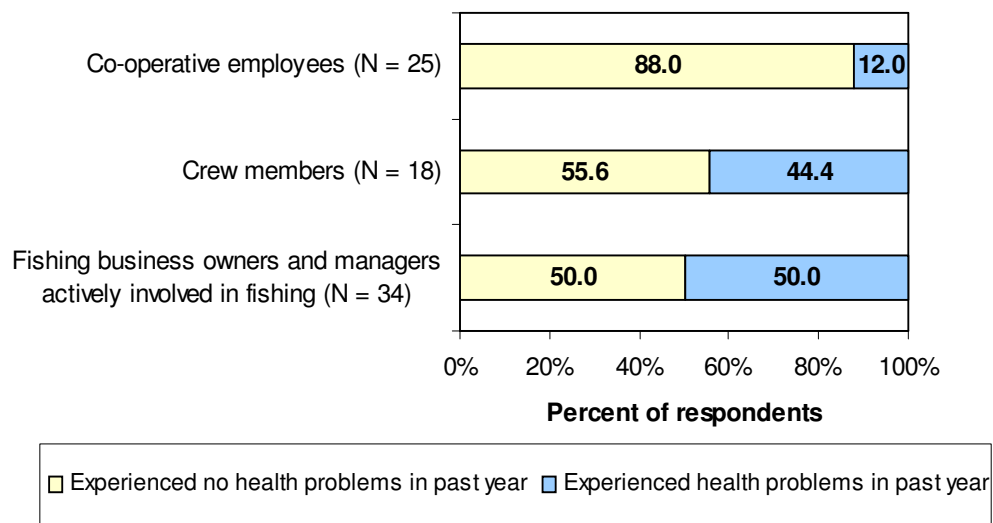


Figure 9: Proportion of respondents experiencing health problems related to their fishing work during 2004

Those who reported experiencing health problems related to their fishing work were significantly more likely to:

- Have low levels of satisfaction with their overall finances ($p = 0.027$); and
- To report that their fishing work involved high or very high risk ($p = 0.034$).

Health risks in fishing

Respondents were asked to identify the level of risk posed by a range of aspects of fishing work. Responses are shown in Figure 10. The highest rated risk was the general physical conditions involved in fishing work. The next highest rated risk was stress, followed by fishing work overall, weather conditions and number of hours worked. The lower rated risks tended to be more specific, with the higher rated risks tending to be broader, ‘catch-all’ categories.

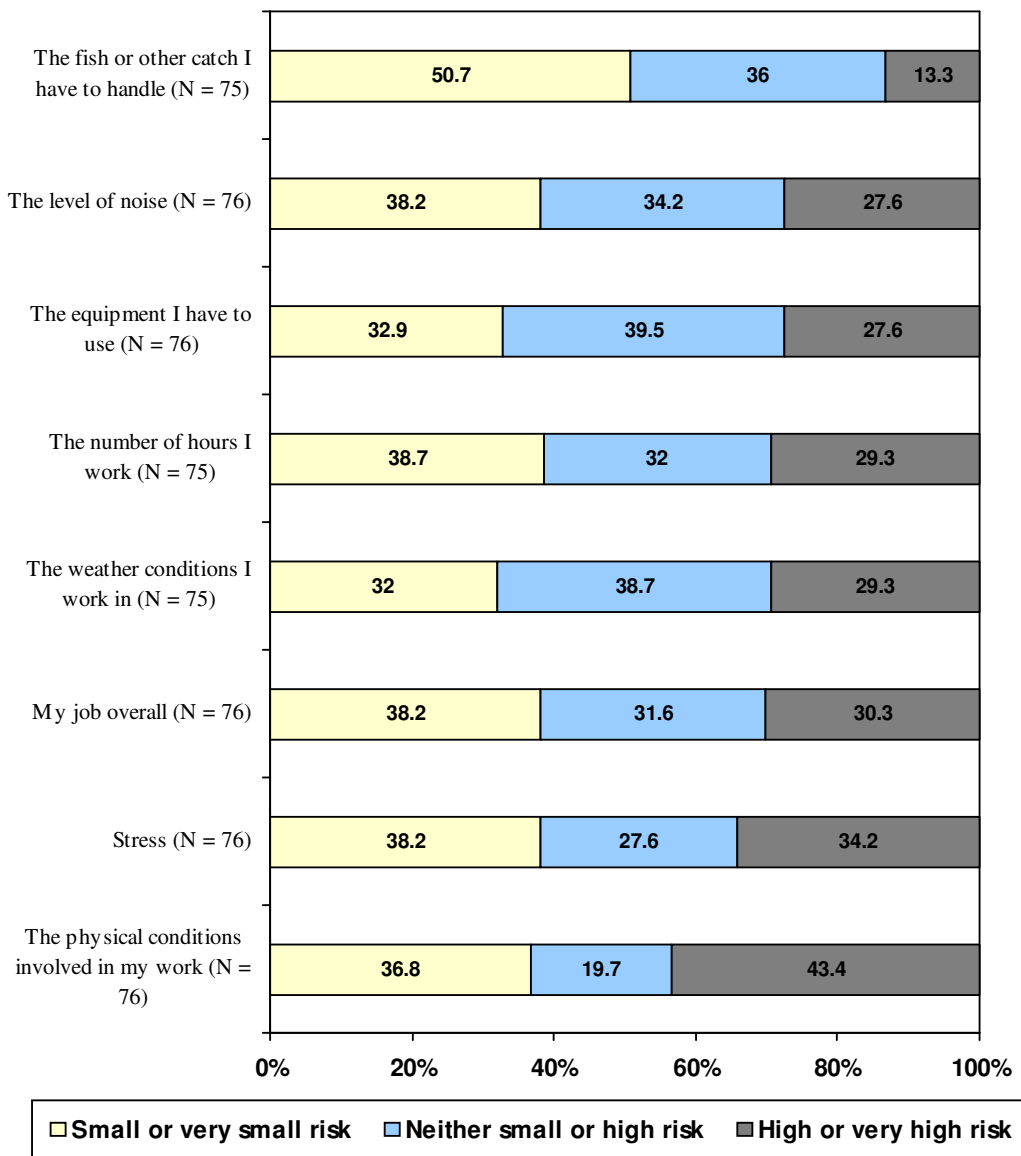


Figure 10: Respondents' ratings of the different risks involved in their fishing work

Perhaps the most striking aspect of the responses was the variability of the rating of risk, which can be seen from Figure 10. Individual fishers had very different perceptions of the risk presented by the various aspects of their fishing work. There may be a number of explanations for this, including variance in the risk of different fishing methods used, and differences in level of risk taken by different fishers due to different pressures to achieve business returns. This is suggested in the relationship between financial dissatisfaction and health problems, suggesting that those under financial stress may expose themselves to more risks and thus experience more health problems. Further work would be required to better understand the variance in risk perception.

Interestingly, perceptions of risk were significantly higher for those fishers who reported they had learned their fishing skills primarily from other fishers, than for those who reported being self taught or taught by family members ($p = 0.017$). This can be seen in Figure 11. Note that this only applied to those working in fishing and not those involved in seafood processing, as co-operative employees were not asked how the methods through which they had developed their work skills. This pattern of response cannot be explained without further exploration of the relationship between how skills are learned and perceptions of risks involved in fishing work.

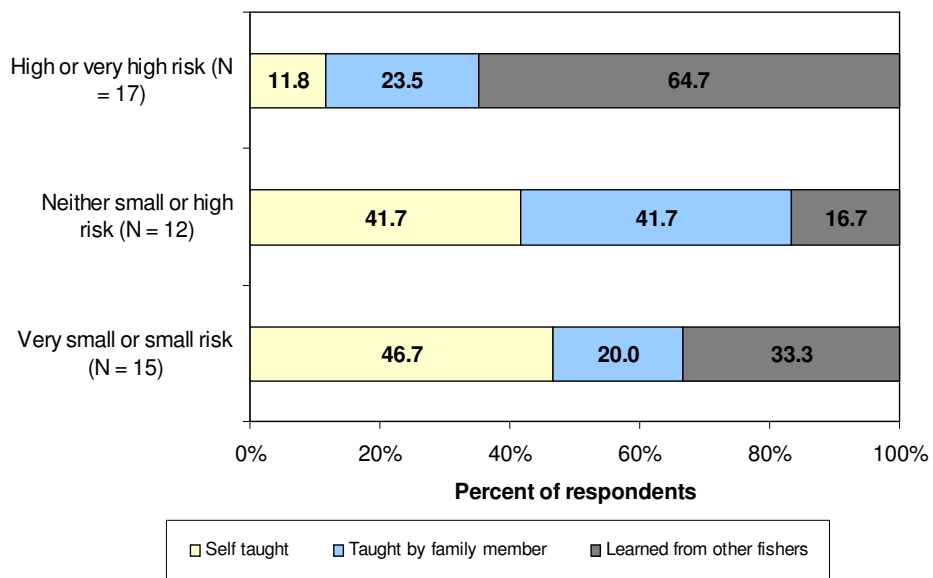


Figure 11: Risk perceptions by primary methods of skills development

Social capital

Social capital represents the networks and shared interactions that individuals can use for a range of purposes, including gaining new knowledge, interacting socially and receiving various types of support – emotional, physical and otherwise.

For this study, three dimensions of social capital were examined:

- Interactions with others in the fishing community;
- Interactions in the local community; and
- Links to the broader community.

The inclusion of work-related networks as a vital part of social networks is a shift in the examination of social capital which usually excludes work-related networks. Fishers indicated that an important part of their social lives often comes from informal and formal interaction with other fishers, and so it was important to include this as a dimension of social capital.

Fishing community

Several aspects of the formal and informal networks existing in the fishing community were examined, including the proportion of friends and family working in fishing, and membership of fishing representative groups.

Figure 12 shows the number of friends and family of respondents who worked in fishing. Despite common perceptions that fishing work tended to be undertaken by several generations of the same family, only 33.7% of respondents reported having few to most of

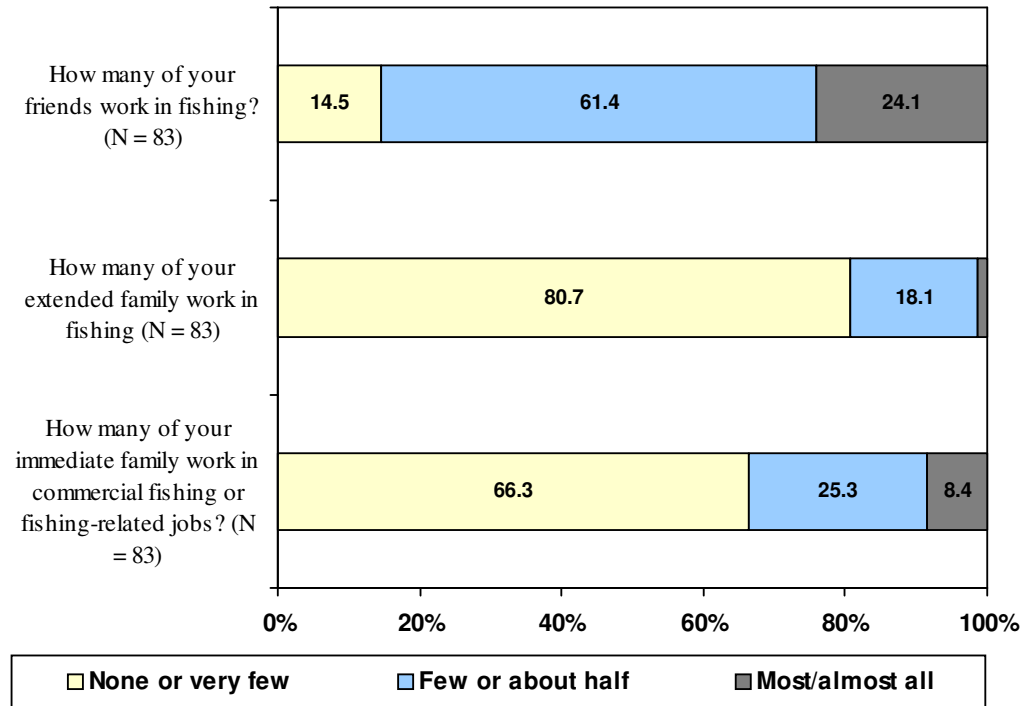


Figure 12: Proportion of family and friends working in fishing

their immediate family currently working in fishing, while 19.3% reporting having few to most of their extended family working in fishing. This compared to 85.5% who reported that between ‘few’ and ‘almost all’ of their friends worked in fishing.

Fishing business owners and managers were significantly ($p < 0.001$) more likely to report having some family members working in fishing than crew members or co-operative employees, as can be seen in Figure 13. Even so, almost half of fishing business owners and managers indicated none or very few of their family currently work in the fishing sector.

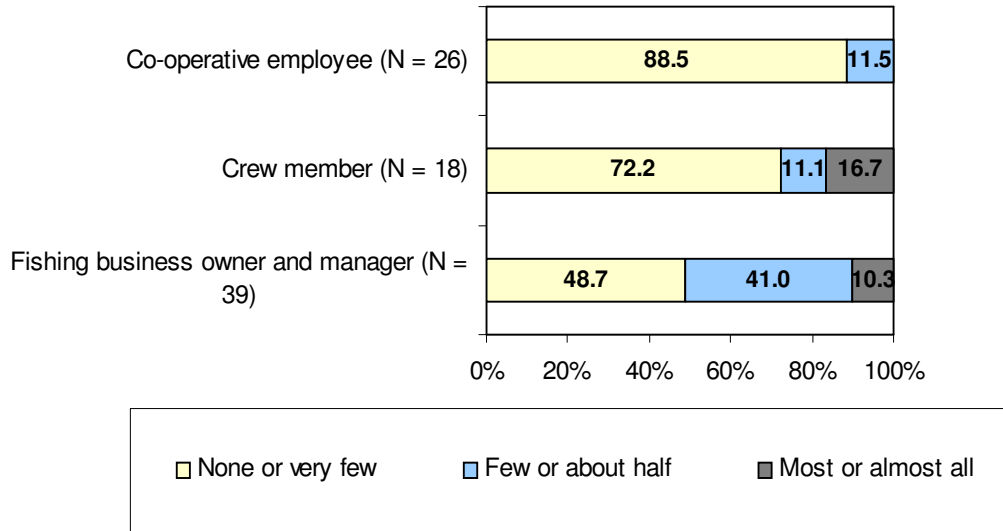


Figure 13: Proportion of business owners and managers, crew members and co-operative employees reporting family involvement in fishing

This indicates that the social networks in fishing are highly dependent on friendships, as well as on family links. For at least one-third of respondents, the family ties form a strong part of their fishing social network.

Membership of fishing representative groups⁴

All fishing business owners and managers who received surveys were members of either of the two co-operatives⁵ through whom surveys were distributed or members of the Eastern Zone Abalone Industry Association⁶.

Only two crew members and one co-operative employee reported membership of any fishing group, with the all of the other reported members being fishing business owners and managers.

⁴ Fishing representative groups are defined as advocacy groups that represented fishers to the broader community. This definition included the Eastern Zone Abalone Industry Association but excluded fishing co-operatives.

⁵ Co-operatives are not included in the definition of fishing representative groups.

⁶ The Eastern Zone Abalone Industry Association is included in the definition of fishing representative groups.

21% of respondents reported membership of groups other than the Eastern Zone Abalone Industry Association. Three or more respondents reported membership of included:

- the East Gippsland Estuarine Fisherman's Association;
- the co-management council;
- the Lakes Entrance Danish Seine Unit Trust;
- anglers clubs; and
- Seafood Industry Victoria.

In addition, between one and two respondents reported membership of seven other groups, not named here.

Part-time fishers were significantly less likely to be members of fishing groups than full-time fishers ($p = 0.031$).

Younger respondents were significantly less likely to be members of fishing groups than older respondents ($p = 0.001$). This is related to the majority of younger respondents being crew members or co-operative employees, with these groups having very low reported membership of groups.

Respondents who were members of one or more groups reporting attending an average of five meetings per fishing group they belonged to in the year prior to completing the survey, although a substantial number (22%) reported attending no meetings.

The low membership of fishing groups by crew members, co-operative employees and part-time workers means that there are few opportunities for these participants in the fishery to share experiences and skills through formal networks.

Local community

The majority of respondents lived in either Lakes Entrance (39 respondents) or Mallacoota (31). Another six respondents lived near these towns. Eight respondents – mostly crew members or abalone business owners/managers - lived in other areas.

Respondents had very positive perceptions of their local communities. A total of 85.6% of respondents felt their local community was an 'excellent' or 'good' place to live, while 54.2% of respondents reported feeling strong or very strong attachment to their local community, and 31.3% some attachment.

Respondents had lived in their local area for between one and 55 years, with an average of 24.3 years. The majority (84.3% of respondents) expected to still be living in the same place in five years time.

Slightly more than half (50.6%) of all respondents reported they were the first generation to have lived in their current local community, while 49.4% reported more than one generation of their family had lived in the local community.

There was a significant difference in the proportions of owners and managers, crew members, and co-operative employees who had lived for more than one generation in their local community ($p < 0.001$). Fishing business owners and managers were more likely to have lived in their local area for more than one generation, as can be seen in Figure 14, while co-

operative employees were least likely to have lived in the local community for more than one generation.

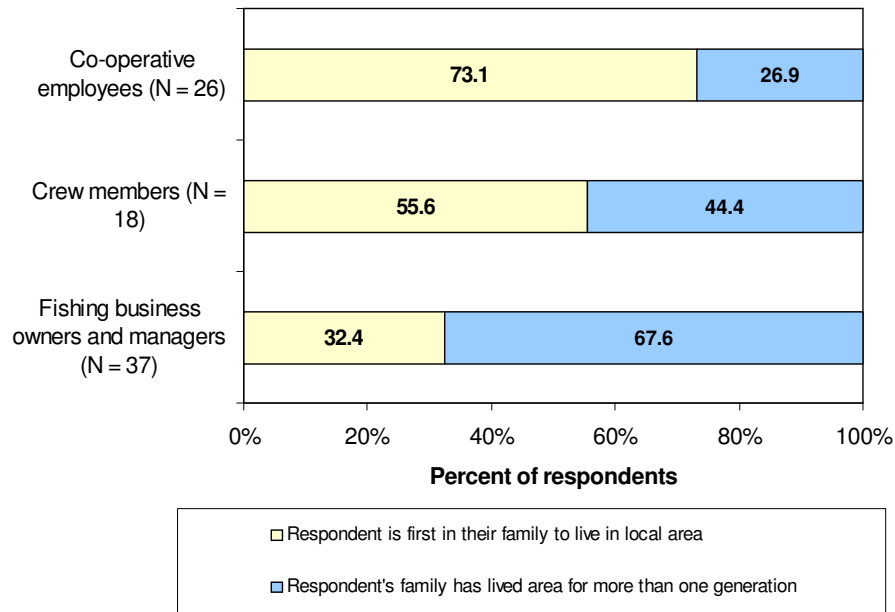


Figure 14: Generations of family living in local community reported by different respondents

Those who worked in abalone businesses were significantly less likely to have lived in their local community for more than one generation compared to other fishers⁷ ($p < 0.001$). Only 46.2% of those involved in abalone businesses (including business owners/managers and crew members) had lived in their local community for more than one generation, compared to 72.4% of other fishers.

Those who reported intergenerational involvement of their family in fishing were significantly more likely to have lived in their local area for more than one generation ($p < 0.001$). Similarly, those with higher numbers of immediate family members working in fishing were significantly more likely to have lived in their local area for more than one generation than those who had very few or no family members working in fishing ($p < 0.001$).

Perceptions of and attachment to local community

As stated above, most respondents rated their local community highly as a place to live, and felt a strong or very strong attachment to their local area. There was a strong relationship between how respondents rated their local community (as excellent, good, fair or poor) and their feelings of attachment to their local community (very strong to no attachment), as can be seen from Figure 15. The relationship was significant at the $p < 0.001$ level.

⁷ Note that this analysis did not define co-operative employees as fishers.

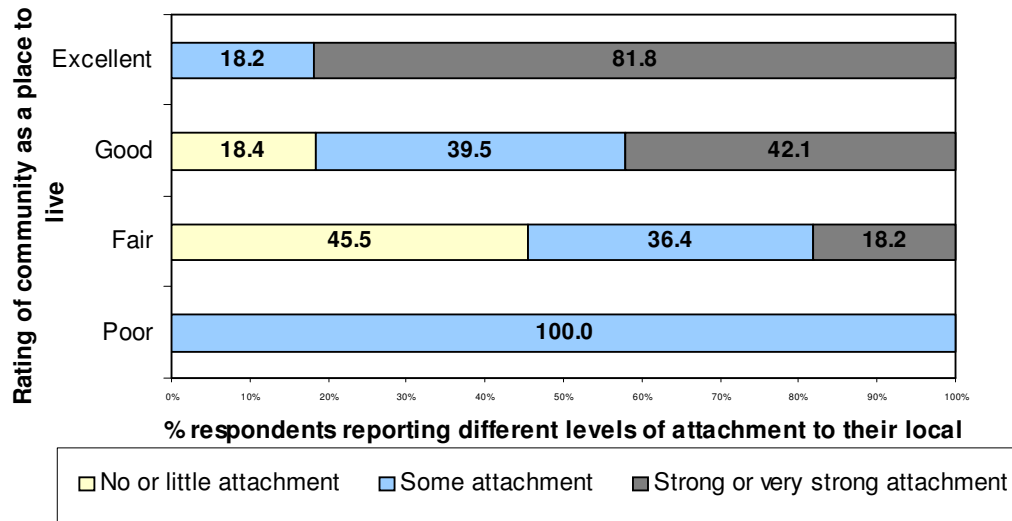


Figure 15: Respondents’ attachment to and rating of their local community as a place to live

Access to services

Respondents reported accessing most services locally. Lakes Entrance residents reported accessing hospitals and universities outside the town, and sometimes used banks, high schools and dentists outside the area. Mallacoota residents reported accessing a large number of services outside their local area, reflecting a smaller number of services available locally. However, key services were still accessed within the local area.

Membership of community groups

Of the respondents, 61.4% belonged to at least one community group, while 38.6% were not members of any.

Figure 16 shows the types of community groups respondents were members of.

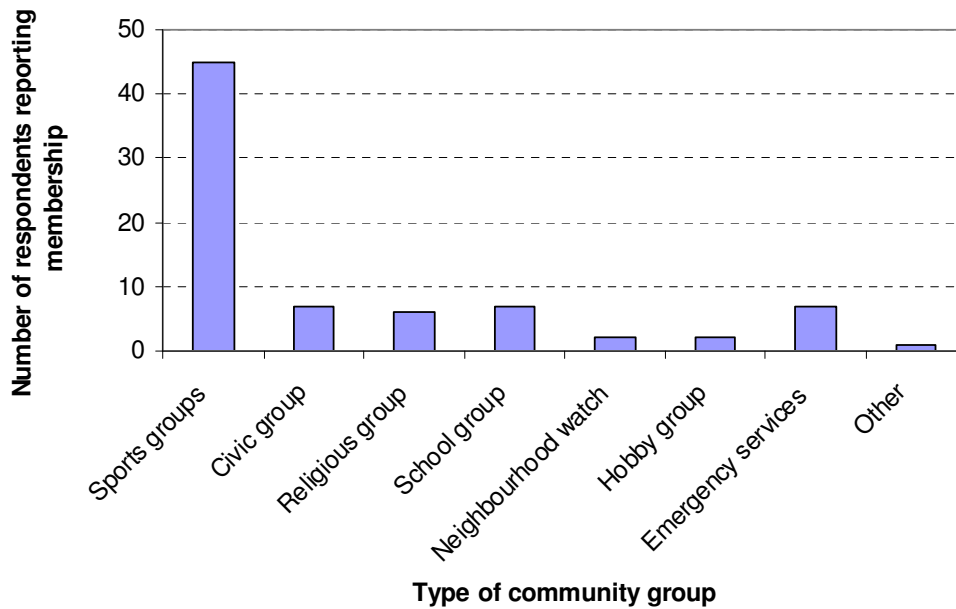


Figure 16: Memberships of community groups reported by survey respondents

Respondents were most likely to report membership of sporting groups, with 53.6% of respondents reporting membership of this type of group. There was a spread of membership of other types of groups such as civic, religious, cultural, school, and emergency services groups.

Respondents were asked if their work in fishing had increased or decreased their ability to take part in social and community activities. Of the 67 respondents who answered this question, 77.6% reported that their work in fishing had decreased their ability to take part, while 19.4% reported it had increased opportunities. Two respondents wrote on the survey that their fishing work had no impact (this was not provided as a tick box option on the survey).

Fishing business owners and managers were more likely to report membership of one or more community groups than co-operative employees, while crew members were least likely to report membership, as can be seen in Figure 17. The difference was significant ($p = 0.050$). Respondents who were members of one or more community groups were also significantly older on average than those who were not members ($p = 0.027$).

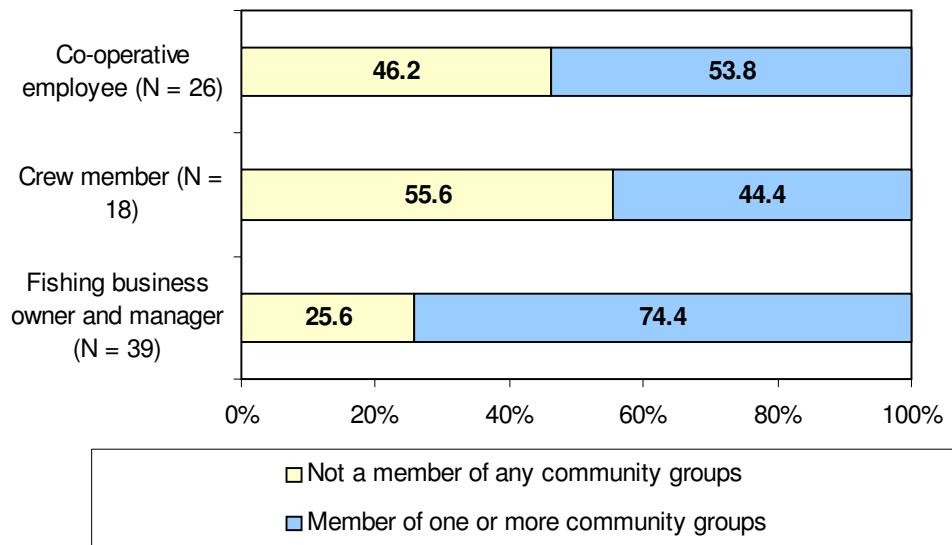


Figure 17: Proportion of different types of respondents reporting membership of one or more community groups

Respondents who were members of one or more community groups were significantly more likely to report a high or very high level of attachment to their local community than respondents who were not members ($p = 0.013$).

Broader community

When asked how they believed their local community and the broader Victorian community perceived commercial fishers, a variety of responses were given. Respondents were almost equally divided as to whether the local community perceived fishers positively or negatively. However, more (48.2%) believed the Victorian community perceived commercial fishers negatively than believed there was a positive perception (15.7%), as shown in Figure 18.

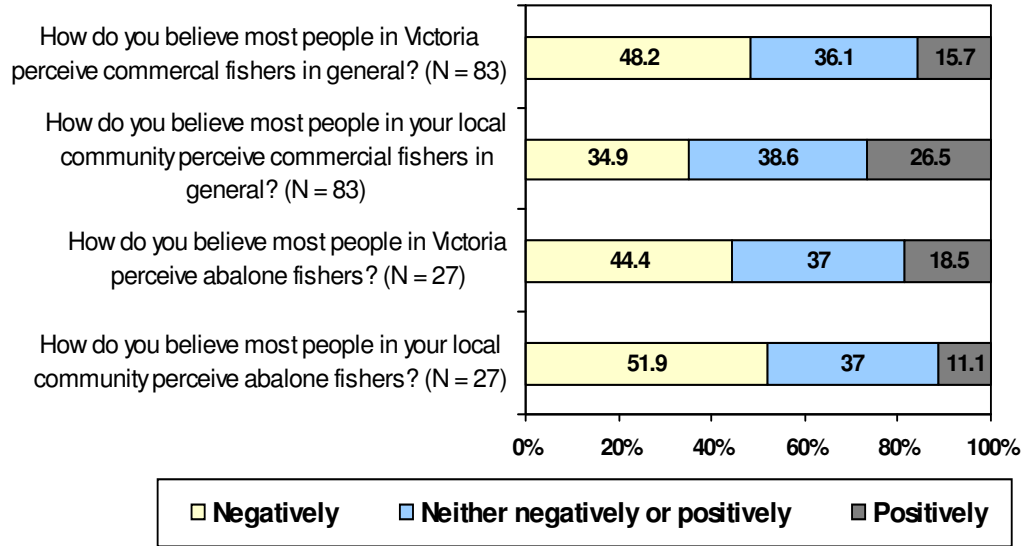


Figure 18: Beliefs reported by respondents about community perceptions of fishing

Those working in abalone businesses were additionally asked how they believed abalone fishers were perceived by local and State communities. Here a slightly different pattern was found, with more believing negative perceptions existed in the local community than in the State-wide population in general.

There was a high degree of correlation in beliefs about how fishers were perceived by the local and the general community. Respondents who believed fishers were perceived negatively locally were significantly more likely also to believe fishers were perceived negatively by the broader Victorian community ($p < 0.001$).

Household income and spending patterns

Respondents were asked about their household income and spending patterns.

On average, 85.3% of household income was derived from fishing activities. Three-quarters of respondents reported that their fishing income contributed over 63% of their household income. The proportion of household income derived from fishing ranged from 20% up to 100%.

Figure 19 shows the proportion of household spending occurring within and outside East Gippsland. The majority of respondents undertook most of their spending locally. Mallacoota residents were more likely to report spending outside East Gippsland, most likely a result of being located close to the Shire boundary.

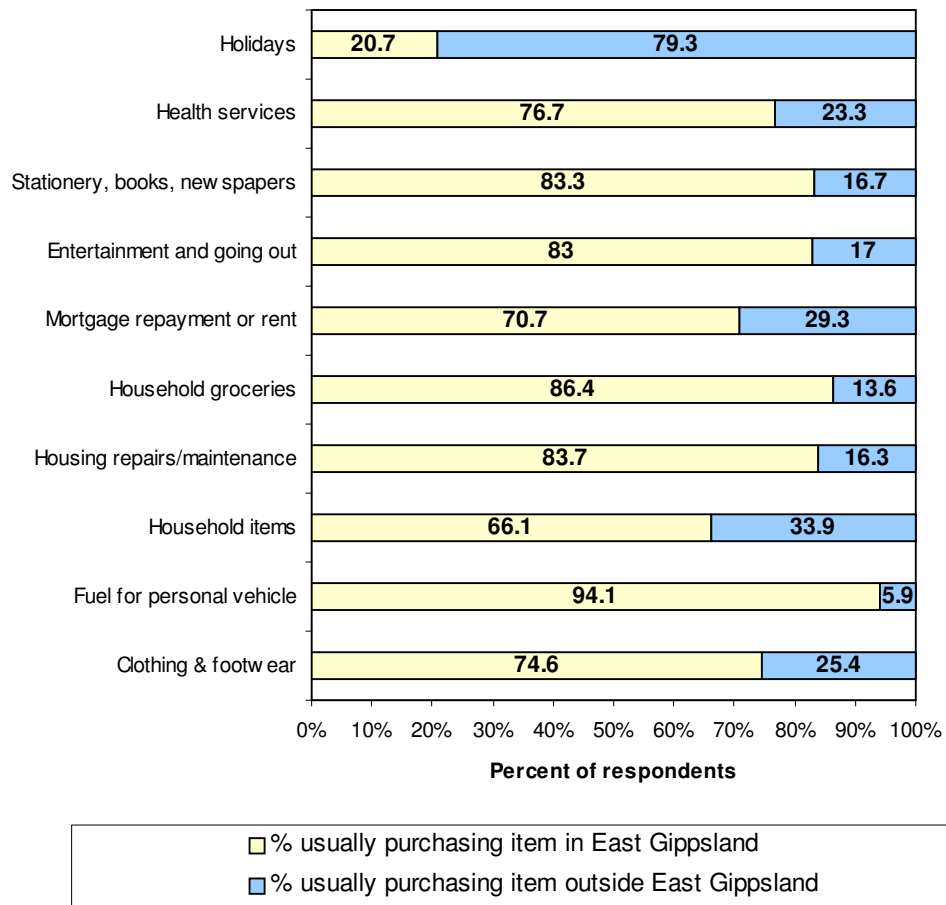


Figure 19: Usual location of household spending as reported by respondents

There was considerable variability in the amount reported spent by different households, indicating high variability in purchasing power across different households. Figure 20 shows the average household spending reported by fishing business owners and managers, crew members and co-operative employees. A clear difference can be seen between these three groups in the amount of reported spending on many items, with fishing business owners and managers generally reporting higher spending than the other two groups, although crew

members and co-operative employees reported spending similar amounts to fishing business owners and managers on repaying mortgages or rent. Housing costs was the only area where co-operative employees reported spending more than other groups.

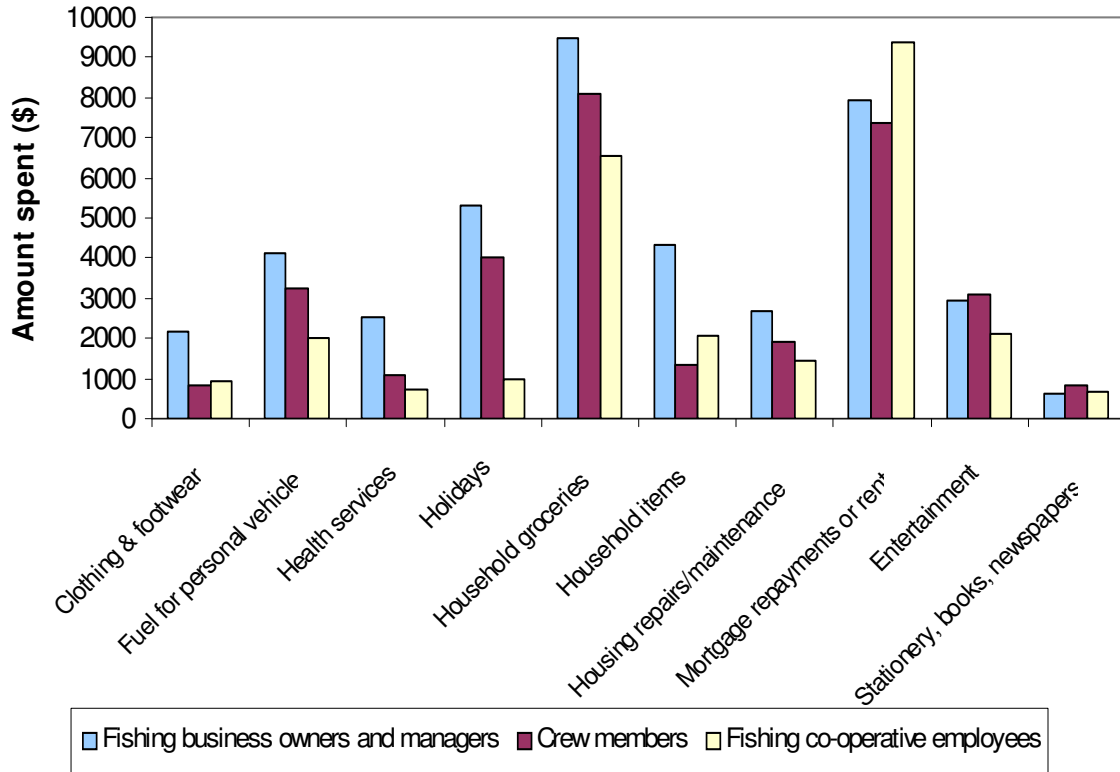


Figure 20: Spending on household items by different groups of respondents

History of involvement in and dependence on the fishing sector

The results above provided details of satisfaction with life and work, and access to different forms of social capital, for those involved in the fishing sector in East Gippsland.

This section focuses on profiling the social history and characteristics of the fishing work undertaken by those working in the sector, and key differences in the social characteristics of those involved in different parts of the sector.

Years worked in fishing

Respondents had worked in fishing for an average of 17.6 years. Fishing business owners and managers had the longest average association (24.2 years), while crew members had worked an average of 14 years and co-operative employees 9.7 years.

Family involvement in fishing

When asked how many generations of their family had worked in fishing, 55% reported being the first generation to have worked in commercial fishing, while 40% reported two to three generations of fishing in their family and 5% four or more.

Fishing business owners and managers were significantly more likely than crew members or co-operative employees to have worked in fishing for more than one generation ($p < 0.001$), as can be seen in Figure 21. Abalone fishers (including business owners/managers and crew members) were less likely to report intergenerational involvement in fishing than other fishers ($p < 0.001$).

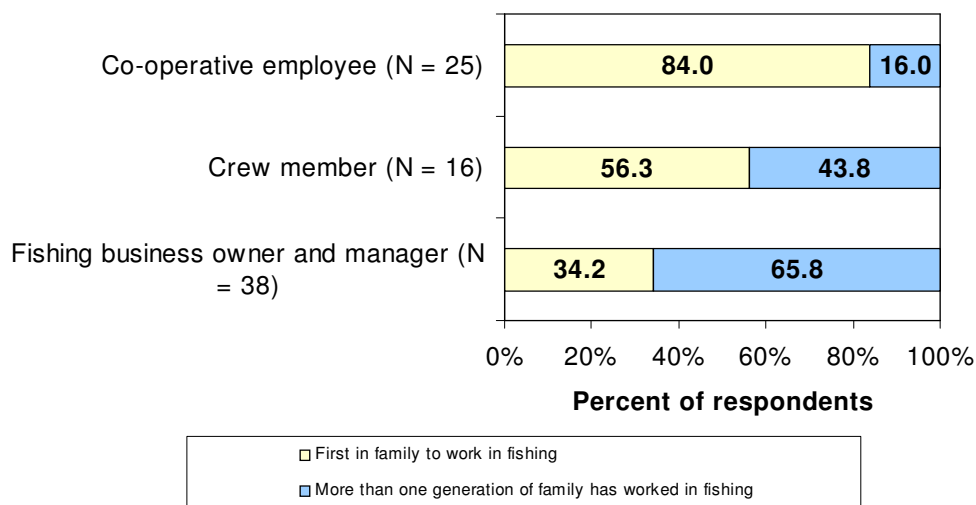


Figure 21: Family history of involvement in fishing

Unsurprisingly, those who reported intergenerational involvement of their family in fishing were significantly more likely to report that ‘about half’ or ‘most to all’ of their immediate and extended family worked in fishing ($p = 0.012$ and 0.002 respectively).

Skills development

Crew members and fishing business owners and managers were asked how they had learned their commercial fishing skills (co-operative employees were not asked this question). This question therefore related to fishing skills rather than business skills.

Responses are shown in Figure 22. Note that respondents could indicate more than one method of learning their skills.

The most common way fishing skills were acquired was through learning from other fishers, and learning from practical experience. The next most common was working in a fishing business not run by a family member, followed by being taught by a family member. Only 12 respondents indicated formal training as a source of attaining fishing skills.

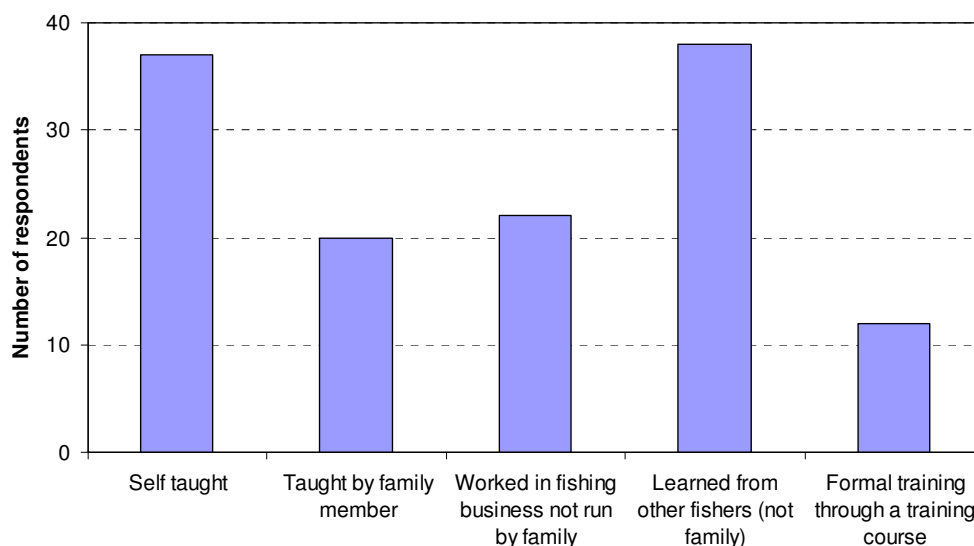


Figure 22: Methods of learning fishing skills

When asked which method they had learned most of their skills from:

- 38% stated they had learned most from experience – through teaching themselves;
- 38% said they had learned most from other fishers; and
- 24% said they had learned most of their skills from a family member.

There was a significant difference in the ways fishing business owners and managers and crew members reported learning their skills, shown in Figure 23. Fishing business owners were more likely to report learning from family members or through experience than crew members, who were more likely to have primarily learned their fishing skills from other fishers ($p = 0.028$). This indicates that these two groups of workers have learnt their skills in different ways, with crew members less likely to learn their skills from family members than business owners and managers. Further qualitative research would need to be undertaken to better understand these changes.

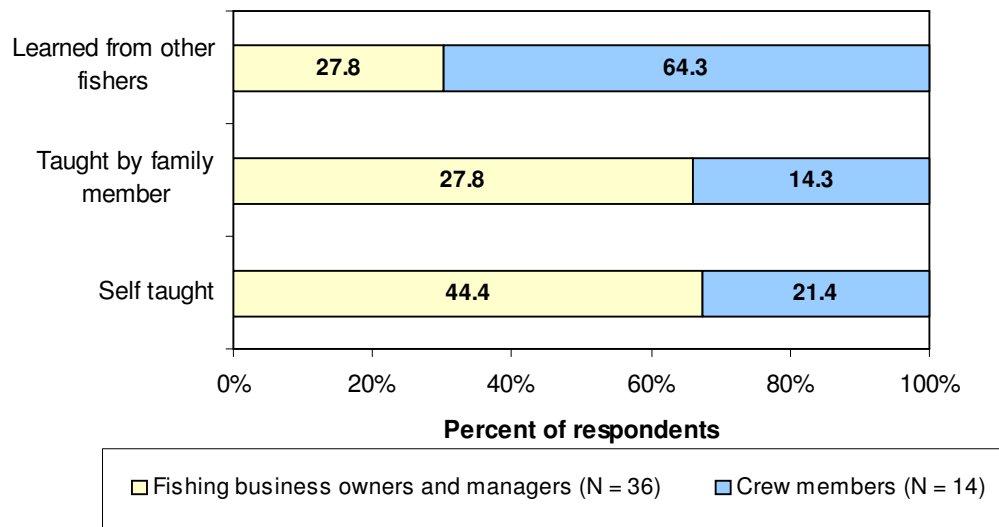


Figure 23: Key methods by which different groups of fishers attained their fishing skills

When primary methods of skills attainment were examined by age group, a slightly different pattern emerged, shown in Figure 24. Younger fishers were significantly more likely to report learning skills from family members or other fishers than older fishers ($p = 0.001$). Older fishers were more likely to report that most of their skills had been developed through self-teaching – i.e. through experience. A similar pattern was found when the method of learning skills was analysed by years worked in fishing, with those who had worked more years significantly more likely to report they had developed their skills through experience than those with fewer years experience in fishing ($p = 0.003$). This may reflect the higher number of years older respondents had spent fishing and the skills learned through these extra years, although further work is needed to explain this result.

As discussed earlier, those who reported learning their skills primarily from other fishers were significantly more likely to report that their fishing work involved high or very high risk ($p = 0.017$).

Dependence on fishing

61.4% of respondents reported that a member of their household had work outside commercial fishing, while 38.6% reported having no members of their household who worked outside commercial fishing. There is obviously variation in the size and structure of households, with respondents self-defining their household. This variation is not considered here, but it is important to note that there were very few one person households amongst respondents.

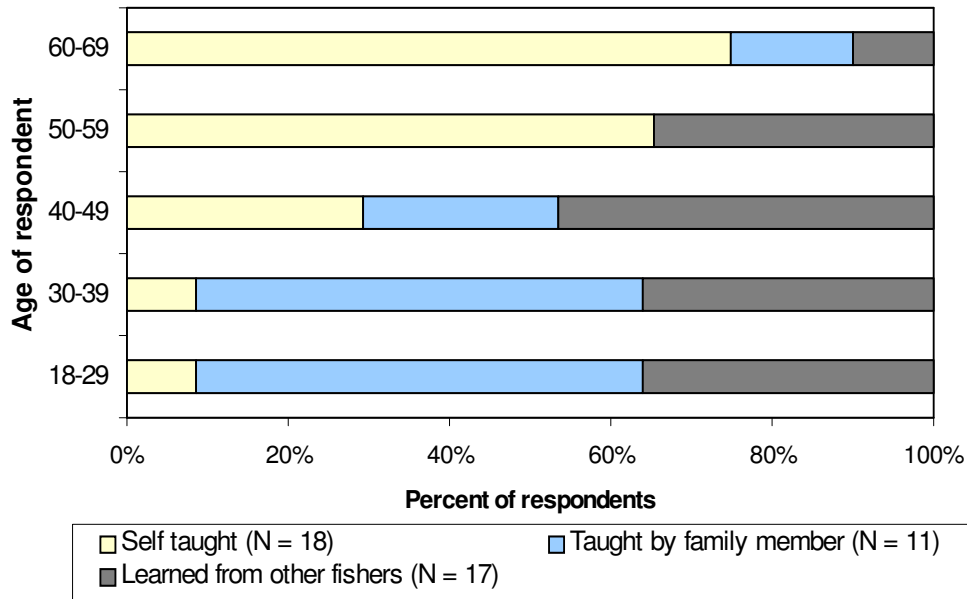


Figure 24: Key methods by which respondents of different ages had attained their fishing skills

71.3% of respondents reported that their fishing work was full-time, and 28.8% that they worked part-time in fishing. Co-operative employees were significantly more likely to work part-time than crew members or fishing business owners/managers ($p = 0.013$).

Fishing businesses

Respondents who owned or managed fishing businesses were asked to provide details of the gross sales, operating costs, and capital value of their fishing business in financial year 2003-04.

A total of 20 respondents (just over half) provided details of the gross sales of their fishing business in financial year 2003-04. The total gross sales ranged from \$32,000 to over \$1.1 million. The mean of the gross sales reported was \$489,000. Older fishing business owners and managers reported significantly higher gross sales than younger fishing business owners and managers ($p = 0.027$).

A total of 21 respondents provided details of the capital value of their business. The mean capital value across all businesses was \$650,000, while the range of capital value (the difference between the smallest and largest reported) was \$7,430,000.

Table 1 compares the average gross sales and capital value for different types of fishers.

Table 1: Fishing business gross sales and capital value in 2003-04 by type of fisher

Type of fishing	Average gross sales during 2003-04 (\$)	Min gross sales	Max gross sales	Average total capital value of business (excluding licence value) 2003-04	Min capital value	Max capital value
Lake fishers	Too few responses to report	Too few responses to report	Too few responses to report	\$250,000	Too few responses to report	Too few responses to report
Ocean fishers	\$437,000	\$32,000	\$1,100,000	\$1,118,000	\$260,000	\$3,500,000
Abalone fishers	\$561,500	\$100,000	\$808,000	\$3,171,000	\$70,000	\$7,500,000

There is a clear difference between lake fishers, ocean fishers and abalone fishers, with abalone fishers reporting higher average gross sales and business capital value than other types of fishers, and lake fishers reporting lower gross sales and capital values. There was considerable variability in the gross sales and capital value of all fishing business types.

Fishing business spending

Fishing business owners and managers were asked to provide details of their expenditure on operating costs. A total of 20 fishing business owners and managers provided this information. Table 2 details the average spending reported on different items. Due to low numbers of responses, it provides details for lake and ocean fishers as a single category rather than separately.

There was considerable variability in the expenditure reported by different fishing businesses. The majority of expenditure was undertaken locally, as can be seen from Figure 25.

Table 2: Fishing business operating costs in 2003-04

Expenditure item	% fishing businesses reporting any expenditure on this item*	Mean (\$)	Range (difference between smallest and largest reported expenditure) (\$) ⁸
Boat fuel	100	32990	216500
Ice	45	4050	9900
Bait	5	100	N/A
Stores	30	6810	8000
Motor repairs	70	4240	9750
Boat repairs	85	10490	59500
Motor vehicle maintenance	90	2300	9700
Motor vehicle fuel	85	3960	14950
Accommodation	5	1500	N/A
Mooring fees	55	2390	6000
Licence fees	85	37600	84800
Insurance fees	85	6570	19225
Wages/catch share to employees	100	116580	270000
Freight	35	19920	91827
Phone/fax/stationery	90	2630	11770
Professional fees eg accountant	90	6250	19350
Vehicle/trailer registration	90	1660	12000
Fishing gear replacement/repairs	90	7600	24000
Other	45	19400	40534

* This percent reflects the proportion of the 20 respondents who provided details of expenditure who reported spending on this item

Employees

Respondents who were fishing business owners and/or managers were asked how many employees – both paid and unpaid – worked in their fishing business.

All respondents reported having paid employees, with an average of six paid employees (working either full or part-time) reported per business. However, there was wide variation in the total employee numbers with the total number of employees working in different businesses ranging from two to 59.

An average of 2.27 paid full-time employees and 7.7 part-time employees were reported per fishing business. Again, there was wide variation in the reported numbers of paid full-time

employees (one to five employees) and paid part-time employees (one to 59 employees). The majority of paid employees were male, and worked part-time.

Fewer reported having unpaid employees working in their business, with an average of 0.37 unpaid employees reported per business, i.e. one in three businesses reported having an unpaid employee.

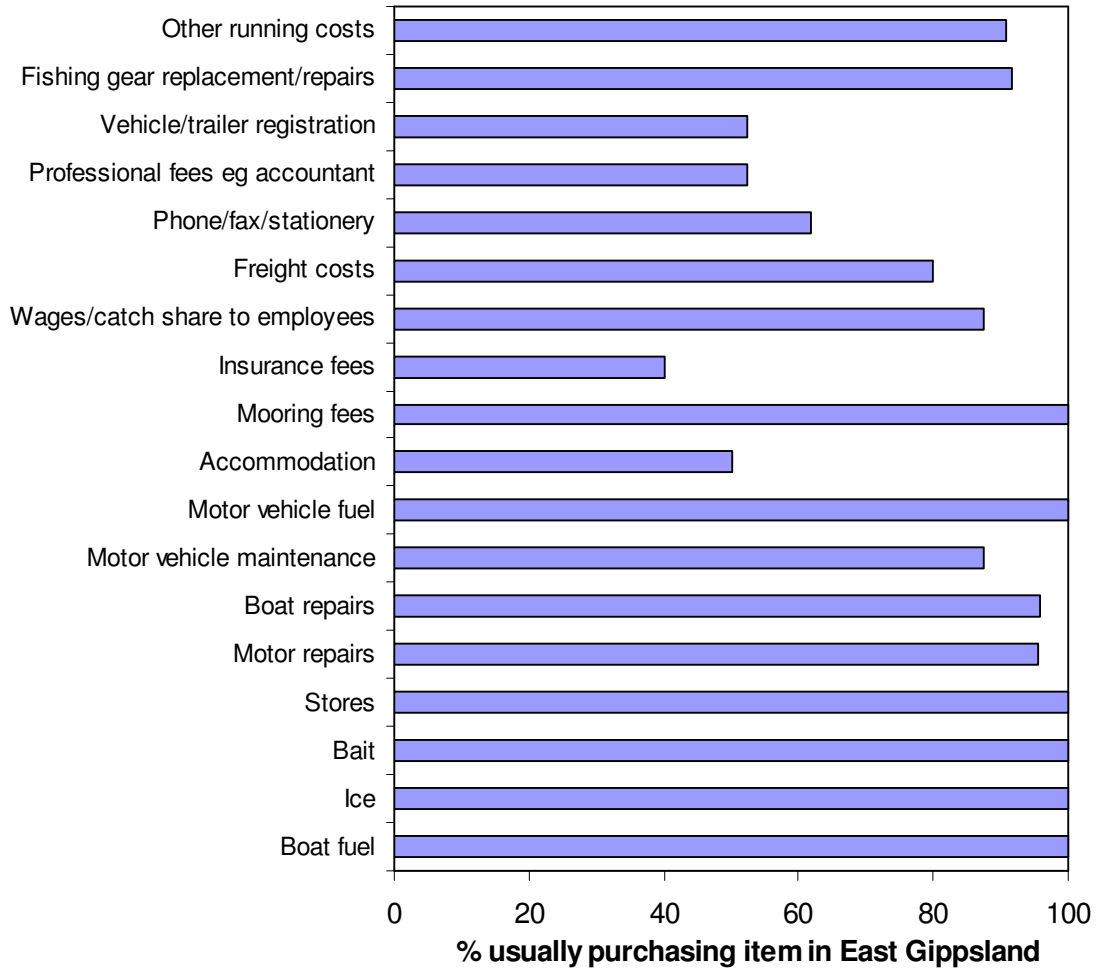


Figure 25: Location of expenditure reported by East Gippsland fishing businesses

Changes affecting fishing business viability

Respondents were asked about the impacts of a range of changes occurring in recent years, that is, had these changes increased, reduced or had no effect on the viability of their fishing business. Responses are shown in Figure 26.

The large majority of respondents reported that proposed future closures of areas to fishing or, in the case of abalone fishers, already implemented closures, reduced their fishing business viability. The next most important negative influence on viability was operating expenses, with increasing operating expenses reported by the large majority to have reduced their viability. Changes in regulation of fishing in general were the next most likely to be reported to reduce fishing business viability, followed by changed availability of fish and changes in fees paid to regulators.

Few respondents reported that recreational fishing affected their viability, probably reflecting the small number of respondents directly competing with recreational fishers in the course of their work, with lake fishers the only fishers likely to be facing ongoing direct competition with recreational fishers for catch in the course of their work. All of the small number of lake fishers who responded to the survey indicated that increased recreational fishing had reduced their business viability.

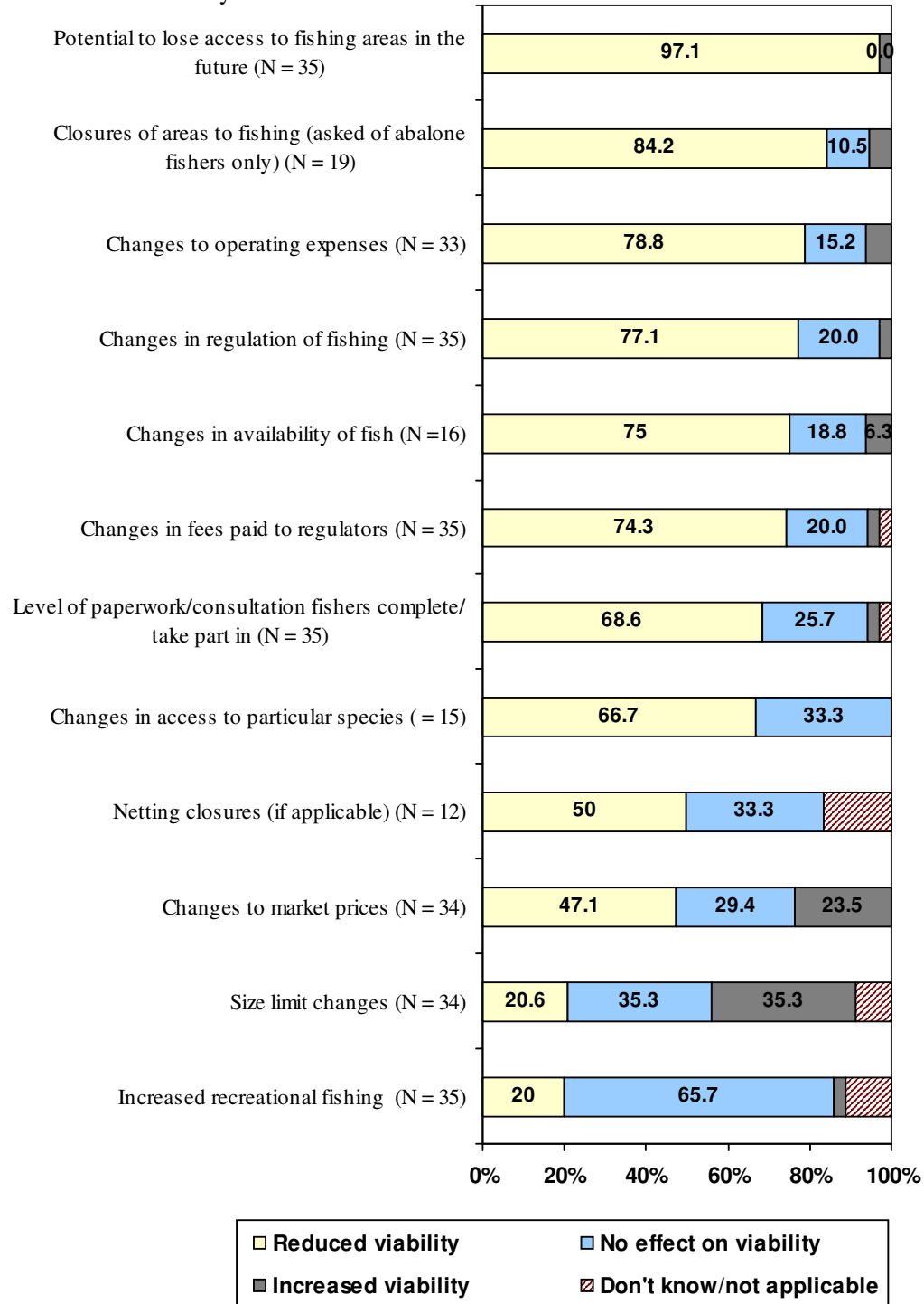


Figure 26: Changes affecting fishing business viability

Future of fishing

Respondents were asked if they would encourage young people to enter fishing. The majority (73.2%) responded that they would. When asked if it has become easier or harder to enter fishing over time, 98.2% responded that it has become harder.

Abalone fishers were significantly more likely to state they would encourage young people to fish than other fishers ($p = 0.022$), with 85.2% stating they would encourage young people to enter fishing compared to 62.1% of other fishers. All lake fishers who responded to the survey stated they would not encourage young people to enter fishing.

Those who reported that they believed the general community had a negative perception of fishers were significantly less likely to state that they would encourage young people to enter fishing ($p = 0.024$). This indicates that the perception of fishing by others affects how fishers view the future of their profession.

All crew members, owners and managers of fishing businesses were asked what work they would have chosen to do if they had not entered into fishing. A variety of responses were given, shown in Table 3.

Most of the alternative types of employment involved practical, applied work, indicating a clear preference for some type of physical work.

Table 3: Preferred types of alternative employment reported by fishers

Type of alternative work	Number of crew members*
Building or construction	8
Farming	6
Tradesman other than building & construction (some specified a trade, eg electrician)	5
Managing or running other type of business	5
Labourer	4
Fishing or other work on ocean	3
Unknown	3
Navy	3
Mechanic	2
Oil industry	2
Police	2
Forestry or tree surgery	2
Other (responses may have made individuals identifiable so types of jobs are not specified)	2
Teacher	1
Transport industry	1
Doctor	1
Computer programmer	1
Office management and administration	1
Landscaping	1

* Note: 53 respondents provided details, some suggesting more than one alternative type of employment

Crew members were asked what their plans were for the future with regard to their fishing work. Figure 27 shows the responses received. Crew members had a variety of plans, most involving continuing to work as an employee in a fishing business. Interestingly, fewer had

plans to become a fishing business owner than planned to continue working in a fishing business owned by another person.

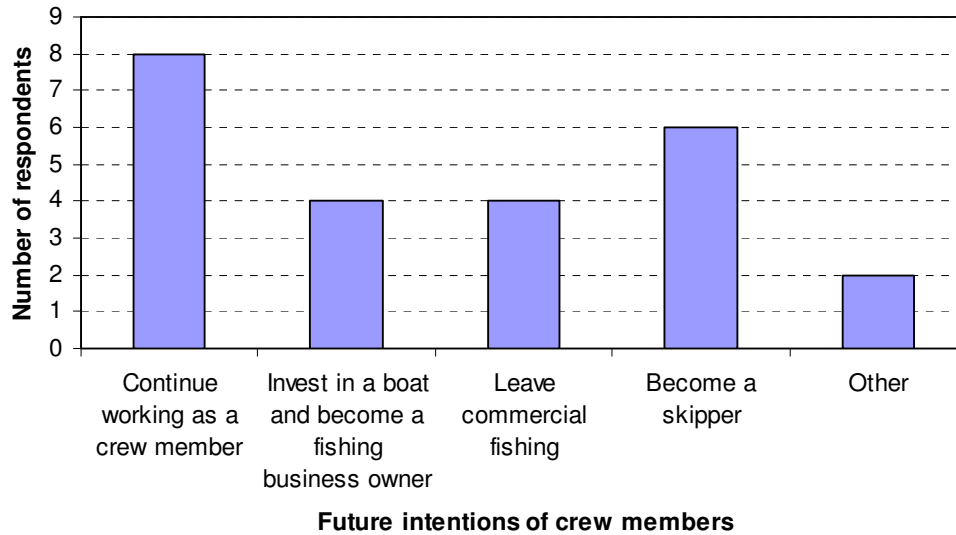


Figure 27: Future fishing work plans reported by crew members

When asked what factors would affect their decision to continue working in commercial fishing, crew members gave a variety of responses, shown in Figure 28. The most important factors were the income received from fishing, stability and security of the industry, and the cost of entering the industry. Family history in fishing was not an important factor driving decisions for the majority of crew member respondents, which was not surprising given that more than half had no family history in fishing.

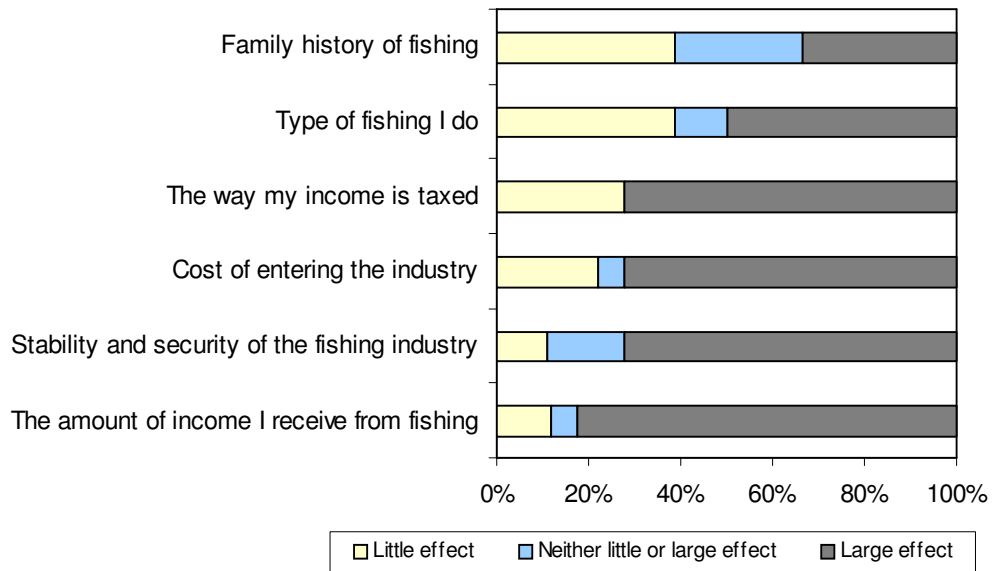


Figure 28: Factors affecting crew member's decisions about their future in fishing

Socio-economic contributions of the commercial fishing sector to East Gippsland

Introduction

This section reports on the impacts of fishing activities on East Gippsland. Figures are provided either for East Gippsland as a whole, or for the two Statistical Local Areas (SLAs) defined by the Australian Bureau of Statistics within East Gippsland – Bairnsdale SLA, which includes Lakes Entrance and much of the population of East Gippsland, and Orbost SLA, which includes Mallacoota and the more remote parts of East Gippsland.

A large number of statistics are given in the table below. A detailed description of the statistics, data sources, and key limitations of the data where there are any, is provided in Appendix 4, which should be referred to when interpreting the regional information.

All ABS figures provided are sourced from the most recent Census of Population and Housing, undertaken in August 2001, and sometimes from changes between the 1996 and 2001 Census. They therefore reflect data that was accurate three years prior to this study being undertaken. This should be kept in mind when examining the data, as in some cases changes since 2001 may have resulted in different social characteristics than those presented here.

Tables 4, 5 and 6 detail key characteristics of the East Gippsland population, and of the fishing sector employees living and working in East Gippsland.

The East Gippsland region is characterised by low population growth and higher than the Victorian average of child and aged dependency (defined as the number of children under 15 and elderly over age of 64 relative to those aged between 15-64). The median age of the population is higher than the Victorian average, and the median age has risen more rapidly than the Victorian average, indicating an ageing population. Unemployment in 2001 was higher than the Victorian average, and a higher proportion of households earned less than \$300 per week than the Victorian average, while a lower proportion earned above \$1200 per week. The Orbost SLA population had a lower median age than the population of the Bairnsdale SLA, indicating the population of Orbost SLA included higher proportions of younger people.

Almost all household and fishing business spending by fishers living in the region occurs within East Gippsland. Considerable catch is delivered to the fish co-operatives – principally LEFCOL and AFCL – operating in the region, where it is processed and sold to various markets. While this study did not examine multiplier effects of catch processing and distribution beyond initial delivery to fish receivers, it is likely that a high proportion of initial flow-on impacts of fishing activities is captured by the East Gippsland economy because of the considerable processing of seafood, and provision of goods and services to fishers, occurring within East Gippsland.

Table 4: Socio-demographic characteristics of the population of East Gippsland

Region	Bairnsdale	Orbost	Victoria (average)
Total population, 2001	23551	8344	-
Annual population growth 1996-2001	0.2%	0.2%	1.2%
Total dependency ratio, 2001	68	60.3	49.6
Median age of total population, 2001	43	40	35
Change in the median age of total population 1996-2001	+4	+3	+2
Sex ratio 2001	94.7	101.9	96.4
% of households earning < \$300/week, 2001	19.9%	22.1%	13.3%
% of households earning > \$1200/week, 2001	12.8%	11.6%	30.6%
Unemployment rate, 2001	9.5%	8.5%	6.8%
Economic diversity, 2001	41.2	42.2	41.4

Source: ABS 2001 *Census of Population and Housing* data analysed by the Bureau of Rural Sciences

Table 5 summarises the average total spending and employment per fishing business within and outside East Gippsland over 2003-2004. An average across all types of fishing business is given, as well as an average for abalone and non-abalone businesses. However, it should be emphasised that different fishing businesses in the region range considerably in their size and expenditure.

Table 5: Average business sales, expenditure and employment within and outside East Gippsland per fishing business

	All fishing businesses	Abalone businesses	Lake and ocean fishing businesses other than abalone
Average gross sales in financial year 2003-04	\$489,500	\$561,500	\$401,500
Average fishing business expenditure within East Gippsland in financial year 2003-04 (excluding licence and quota payments)	\$206,500	\$169,000	\$221,000
Average fishing business expenditure outside East Gippsland in financial year 2003-04 (excluding licence and quota payments)	\$61,000	\$69,000	\$41,500
Average number of paid full-time employees in financial year 2003-04	2.3	2.3	Lake fishers: 1.0 Ocean fishers: 1.0
Average number of paid part-time employees in financial year 2003-04	7.7	14.3	Lake fishers: 1.0 Ocean fishers: 3.7

Table 6 details average household spending by respondents – including fishing business owners, crew members and co-operative employees – within and outside East Gippsland. The majority of household spending occurred within East Gippsland, and given the high numbers of people working directly in the fishing sector, is likely to have a major impact on the Gippsland economy.

Table 6: Average household spending within and outside East Gippsland per fishing sector member

Household spending category	Average spending inside East Gippsland per person working in the fishing sector (\$)	Average spending outside East Gippsland per person working in the fishing sector (\$)
Clothing & footwear	2300	785
Fuel for personal vehicle	1280	80
Household items	1010	520
Housing repairs/maintenance	2775	540
Household groceries	6955	1095
Mortgage repayment or rent	2035	845
Entertainment and going out	1715	350
Stationery, books, newspapers	7080	1420
Health services	2005	610
Holidays	140	530

Discussion and conclusions

Concepts such as ‘quality of life’ or ‘social well-being’ are often viewed as nebulous concepts that are difficult to measure. The questionnaire used in this study examined several dimensions thought to impact on the quality of life and social well-being of the people working in the East Gippsland fishing sector, including their satisfaction with life and work, access to social capital, income and key stressors affecting their work.

The results show that many of these key concepts are related to each other – for example, overall levels of satisfaction with life and fishing work were highly correlating, indicating a strong relationship between the two.

This study was limited in its ability to examine the overall ‘level’ of quality of life in the fishery, in that there are few data to compare the results of the study to. Therefore analysing whether quality of life has increased or decreased over time was not possible. Undertaking a follow-up survey in two to five years time would allow a detailed assessment of how well-being and quality of life are changing over time.

The results of the questionnaire indicate that those working in the fishing sector have a generally high quality of life, but are facing significant stresses and challenges which place pressure on this quality of life and, for many, reduce it significantly.

Social well-being for those working in fishing was clearly related to their overall financial well-being, as well as to a range of other factors. Overall, the majority of respondents reported being satisfied or very satisfied with their life. However, survey respondents tended to be less satisfied with their overall household finances than with other aspects of their lives, indicating that some may be experiencing financial stress.

The most important aspects of work affecting overall well-being are the extent to which fishers feel they have long-term job security, a good balance between work and home life, and fair management of fishing. The nature of the tasks undertaken in their fishing work is also very important, with survey respondents identifying that the stimulation and challenge of fishing work is very important to them. Achieving a high income was important to most survey respondents, but overall ranked as being of either lower or equal importance when compared to the dimensions of fishing work listed above. It is therefore very important not to measure well-being of those working in the fishing sector based only on their income. Understanding whether the tasks and environment worked in are affecting well-being is equally important, as is understanding how external pressures affecting fishers are influencing their well-being.

When overall levels of work satisfaction were broken down into different dimensions of work satisfaction, some of the stressors affecting the quality of life of fishers could be clearly seen. While respondents to the questionnaire had high levels of satisfaction with the tasks undertaken while fishing, their satisfaction with external management and influences on their fishing work was significantly lower. Several respondents wrote detailed comments about the concerns they held about the future of fishing. These concerns mostly focussed on criticism of management of the fisheries they operate in. Many fishers reported that changes to management had reduced fishing business viability, while some wrote comments on their surveys indicating that they believed the changes had not improved sustainability of fisheries. These concerns were reported in particular by ocean and lake fishers, and less by abalone fishers.

A high proportion of survey respondents reported experiencing health problems related to their work. Most of those experiencing health problems were those involved in catching fish and seafood, with few fishing co-operative employees reporting health problems related to their work. Those experiencing health problems were significantly more likely to report low levels of satisfaction with their overall finances, indicating that financial well being and health are linked. Health problems appear strongly correlated with lower overall well-being of fishers.

There is evidence of intergenerational change occurring in who enters the fishing industry and how they learn their fishing skills. Those who undertake catching of seafood are more likely to report intergenerational involvement in fishing than co-operative employees. However, crew members and younger fishers are less likely than fishing business owners and managers and older fishers to have a family history of involvement in fishing, indicating a shift away from traditional patterns of family involvement in fishing. Younger fishers were also more likely to report learning their fishing skills from working in fishing businesses not run by a family member. Some complex changes are occurring in how fishing skills are learned; further work would be required to better understand these changes.

Some major differences were observed between different types of fishing businesses. Lake fishing businesses reported generally lower gross sales and capital value of their businesses than ocean fishing and abalone businesses, while abalone businesses reported the highest average gross sales and capital values. All fishing businesses reported purchasing a high proportion of the inputs required to run their businesses within East Gippsland, indicating a high level of economic activity is generated in the local region from the sector. Lake and ocean fishers were significantly more likely to report having an inter-generational history of involvement in fishing than abalone fishers.

The overall wellbeing of fishers – particularly their views on the future of fishing –were strongly influenced by their beliefs about how commercial fishers were viewed by the local community and the general Victorian public. Those who believed there was a negative perception of fishers were less likely to state they would encourage young people to enter fishing as a career.

Fishers showed a strong preference for undertaking physical work and learning through practical experience rather than through formal education, as evidenced by the low level of formal education achieved by most respondents. Interestingly, younger respondents did not tend to have achieved higher levels of formal education than older respondents, indicating that people entering the fishing industry in recent years have often left formal education during high school to work in fishing. When asked what jobs they would have chosen if they hadn't worked in fishing, most respondents identified a preference for jobs involving highly skilled physical work.

The commercial fishing sector is a major contributor to the East Gippsland community. While this report could not estimate total levels of expenditure by the fishing sector in the region, due to low reporting of financial details of fishing businesses by survey respondents, an average level of spending per fishing business was calculated. Fishing businesses support a large number of employees in the region who work in fishing, fish processing and provision of goods and services to fishing businesses.

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Appendices

Appendix 1: Methods

The goals of this study were two-fold: to test different methods of social assessment, and to assess the quality of life of those involved in the commercial fishing sector and their links to the wider community.

Available sources of secondary data were limited, and so it was necessary to gather primary data from those employed in the sector in order to understand their social characteristics. Data was gathered using a questionnaire that was distributed to fishing business owners and managers, crew members and fish co-operative employees in the East Gippsland region. Separate questionnaires were designed for (a) business owners and managers, (b) crew members and (c) fish co-operative employees. While all three surveys contained many identical questions, business owners and managers were additionally asked for details of their fishing business expenditure, sales and employment and factors affecting business viability.

Questionnaires were distributed in late 2004 via the Lakes Entrance Fishing Cooperative Limited (LEFCOL), the Abalone Fishing Cooperative Limited (AFCL) and the Eastern Zone Abalone Industry Association (EZAIA).

The questions asked in the survey were developed from a review of approaches and methods of social assessment in fishing and other sectors. The results of this review have been presented by Schirmer and Casey (2005) as a guide to undertaking social assessment in the Australian fishing sector, and are not discussed in detail here.

The review of existing literature found that a number of approaches to social assessment have been undertaken in other studies, focussing on a range of dimensions of social well-being. These dimensions have included:

- people's satisfaction with their life and work;
- people's levels of health, and the safety of their home and work environments;
- attachment to and satisfaction with the local area and community people live in;
- various dimensions of social capital;
- economic factors affecting well-being such as income;
- measures of economic dependence of broader communities on fishing, eg through measures of the spending of fishers in different regions;
- qualitative measures of key stresses arising from employment and other activities impacting well-being; and
- demographic factors and how they relate to all of the above.

This case study was designed to measure all these dimensions of quality of life and social well-being. This entailed specific design of many questions and approaches for the fishing sector, due to the unique nature of employment in commercial fishing and how that employment is structured. Some of the key survey design issues are discussed in the

overview of methods below, which includes an overview of the design, implementation, response rate and analysis of results of the questionnaire, and an evaluation of the effectiveness of the methods used.

Questionnaire

Because of the diversity within the commercial fishing sector in East Gippsland, achieving a thorough understanding of social dimensions of the sector was best achieved by undertaking a quantitative survey of those directly employed in fishing.

Design and testing of the questionnaire

The questionnaire was designed in a 2-round process:

- Initial questions were designed based on results of the review of social assessment literature discussed above; and
- Questions were reviewed by six people involved in commercial fishing in the region, including fishing business owners and managers, a crew member, and two co-operative employees, and revised based on their suggestions.

This process ensured questions were phrased appropriately and covered relevant topics. It also allowed development of different questions targeted at particular parts of the fishing community, with some question sets designed specifically to suit owners and managers, crew members, and co-operative employees. Questions which varied depending on the type of respondent are indicated in Appendix 2, which details the key survey questions asked.

The broad categories of questions are outlined below. Within each of these categories, specific questions targeted to the fishing sector were designed for the questionnaire, rather than using existing generic question sets which often had limited applicability to fishers⁹.

The questionnaire topics asked about the respondent's:

- life satisfaction;
- work satisfaction, including satisfaction with external constraints imposed on fishing, actual tasks undertaken while fishing, time spent fishing, and income received from fishing;
- health and safety, including health problems experienced and perceived risks involved in fishing work;
- social capital, including: amount of contact with friends, family and members of the local community; formal and informal links to, and amount of contact with, other fishers; access to services and membership of community groups; and perceived perceptions of the broader community about fishing;
- methods of fishing skills development;

⁹ Quite often, questions sets on areas such as work satisfaction ask questions that are oriented more towards employees in a large business, and have limited applicability to owner-operators of small businesses such as many fishers.

- fishing history and activities, including the length of time respondents had worked in the commercial fishing sector, inter-generational involvement in the sector and types of tasks undertaken;
- perceptions of the challenges and future of the sector;
- household spending patterns including usual location of spending;
- fishing business owners were asked about aspects of their fishing business including sales, commissions, number of paid and unpaid employees, location and number of fish receivers, and expenditure on running and capital costs;
- perceptions of changes affecting fishing business viability; and
- demographic characteristics (age, gender, dependents, marital status and formal education level).

Questionnaire distribution process

The questionnaire was distributed via LEFCOL, AFCL and EZAIA as these organisations could reach fishers – including those who held licences or access rights in particular fisheries, and those who worked directly in catching or processing seafood – operating in East Gippsland. A total of approximately 235 surveys were distributed to those working in the fishing sector in the region¹⁰.

The survey was designed to reach all those in East Gippsland who were working directly in catching and processing seafood. The study did not survey others in the region who supply goods and services to the catch and processing sector – eg those employed in maintaining and repairing boats and equipment or in the transport industry.

Rather than a sampling strategy, a census approach was used to surveying those employed in catch and processing activities in the region. The census approach was used as the likely response rate was unknown, making a larger survey distribution more appropriate to ensure generalisable results. A census also allowed the diversity within the sector to be fully explored.

All surveys for fishing activities other than abalone fishing were distributed via LEFCOL with a covering letter (attached in Appendix 3) signed by key members of the fishing sector in the region, encouraging fishers to complete the survey. The abalone survey was sent with encouragement from the EZAIA for their members to complete the survey. Respondents were also provided with a toll-free number they could call to seek assistance with completing the survey.

LEFCOL and the EZAIA reminded their members to return the surveys. LEFCOL reminded their members when they visited or called the co-operative, asking them to complete the survey. The EZAIA reminded their members via a newsletter to return the survey.

Response rate

The response rate received was approximately 36.6% across all respondents, with a total of 84 valid survey responses received. The total population of those working in fishing in the

¹⁰ The number is approximate as in some cases skippers or fishing business owners distribute the survey to their crew members, and it was not possible to confirm for all businesses the exact number of crew members surveys were distributed to.

region fluctuates over time, making it difficult to determine a total population figure. As a result, the population of people landing catch through the co-operatives and working at the co-operatives while surveys were being distributed was taken as the total population.

Survey response rates were high from the co-operative employees (68% across both co-operatives), while response rates from crew members were low at approx. 27% from abalone business crew members and 15% from other fishing business crew members. Approximately 43% of abalone business owners and managers returned surveys, while 30% of other fishing business owners and managers responded.

Because the response rate from some sectors was low, and many respondents did not provide financial data, the study was limited in the extent to which it could provide estimates of spending by the fishing sector in East Gippsland.

Non-response bias

With any quantitative survey, there is the possibility that those who complete the survey are not representative of the population being surveyed – in other words, for bias to occur as a result of some sectors of the sample frame not responding to the questionnaire.

It was not possible to examine non-response bias in detail in this survey, as demographic data on the fishing community was not available. However, the distribution of ages and gender of those who completed the survey matched the qualitative data provided by those who assisted in survey distribution at the co-operatives, indicating a reasonable spread of response across the fishing population.

However, it is likely that the survey responses were skewed towards paid employees in fishing businesses and did not reach many unpaid employees working in fishing businesses, particularly women. Seevers (2004) documented the women in the region undertake considerable work in fishing businesses owned by their partners, yet this did not appear to be reflected in the employment reported by survey respondents, although several indicated they had a paid female employee working in their fishing business. It is possible that this 'hidden' employment was not captured adequately by this survey, and this should be kept in mind when interpreting results of the study.

Another key type of response bias also resulted from the nature of those landing catch at LEFCOL. Those fishing businesses that only land catch occasionally at LEFCOL were less likely to be reminded to return the survey, and so the surveys returned were more likely to be from those who were landing catch regularly at LEFCOL during the surveying period.

Statistical analysis of survey data

Findings in this report are presented so they can be easily understood without a need for knowledge of the statistical methods used in the data analysis. A brief overview is given here of key statistical tests used.

All statistical analysis used the SPSS software package. The types of statistical analysis used were descriptive statistics, Spearman rank order correlations, Gamma correlations, Kruskal-Wallis and Pearson chi squared tests.

Descriptive statistics are used to present and describe the responses provided to questions in the survey. The statistical tests listed above have then been used to explore these results for statistically significant differences in the pattern of occurrence of particular variables. For these statistical tests, results were considered statistically significant if they met the ' $p \leq 0.05$ ' criteria, where 'p' refers to the probability of a result occurring, and 0.05 refers to the level of

likelihood of that result. This criteria meant that the probability of the results occurring randomly had to be less than 5% for results to be considered significant.

Spearman rank order correlations were used to identify hypothesised relationships between variables. For example, fisher age was hypothesised to be related to fishing income. Spearman rank order correlations place respondents on each variable from highest to lowest and determine the extent that there is a relationship between ranks on the two variables. Where relationships between ordinal variables were being examined, Gamma correlations were used. For both types of correlation, a negative correlation coefficient or r_s indicates that a higher score on one variable is linked to a lower score on the other. The value of r_s can range from 1 to -1 . Values closer to 1 or -1 indicate a stronger relationship.

Kruskal-Wallis chi-square tests were used to determine the presence of significant differences across continuous variables for two or more independent groups. For example, this test was used to determine if there were significant differences in the ages of members and non-members of fishing representative groups.

The Pearson chi-square test was used to determine the presence of differences across ordinal or binomial data for two or more independent groups. For example, it was used to determine if there were significant differences in the reported level of satisfaction with work of members and non-members of fishing representative groups.

Effectiveness of different methods

A specific goal of this study was to assess the effectiveness of different approaches for use in social assessment of commercial fishing. The following aspects needed to be assessed:

- Effectiveness of the process used for distribution of the questionnaire; and
- Appropriateness of questions and topics.

Distribution of the questionnaire

Distribution of the questionnaire solely through the fish co-operative did not achieve a high response rate. This can be seen from the lower response rates to the survey distributed via LEFCOL compared to the response rates from the survey distributed via EZAIA. It would appear that, while fish co-operatives are useful for identifying and contacting fishers, there may be limitations to distributing a survey via a co-operative. Some fishers who refused to return the survey were concerned that returning the survey via the co-operative might breach their confidentiality, even though the co-operative already held their financial records and kept those confidential.

Fishers also expressed dissatisfaction with levels of paperwork they were asked to complete in general. This may have reduced their willingness to complete the survey.

Distribution of the survey via co-operatives and fishing associations did allow targeting of not only licence holders in fisheries but also crew members and co-operative employees. However, the low level of formal membership of crew members in fishing representative groups meant that it was still necessary to distribute surveys to crew members via fishing business owners or managers, either when they came in to unload catch at the co-operative or via asking members of fishing associations to give their crew members questionnaires.

Distributing surveys to fishers via the fish co-operative took considerable time due to fishing businesses often landing catch at the co-operatives infrequently. It also failed to achieve a

high response rate, possible because fishers were not receiving regular reminders via mail to complete the survey, and were only reminded of the survey when they landed catch at or contacted the co-operative for other purposes. Distributing surveys to abalone fishers via EZAIA was more effective, resulting a high response rate in a relatively short time frame. It is recommended that where possible future surveys be distributed via fishing representative associations, rather than fish co-operatives.

Appropriateness of survey questions

The majority of survey questions were answered relatively easily by fishers.

The approach taken to designing the questionnaire, in which questions were designed to be specifically applicable to those working in different parts of the fishing sector, and to answer more general questions about social well-being, was clearly successful.

This highlights the importance of working with those involved in the fishing sector to design meaningful questions, rather than using existing question sets from previous surveys which may not be applicable.

However, a small proportion of the questions asked in the questionnaire were problematic and may need re-design in future surveys. There were also some suggestions at workshops for additional questions that could be included in future surveys.

Problematic questions included:

- Many respondents did not completely answer questions about their level of activity in fishing and community organisations, indicating the questions asked for too much detail;
- There was some difficulty identifying whether particular items were purchased locally if they had been purchased via mail or electronic payment eg for fishing licence fees or payments of phone bills.

Suggestions for additional questions in future surveys include:

- Questions asking about the level of debt of the fishing business to assist in analysing how vulnerable fishers are to changes affecting their income.

Appendix 2: Mail questionnaire

The questions asked in the questionnaire have been included in this Appendix. The questions were presented in a booklet formatted to allow easy completion of questions.

The questions are listed below without the formatting they had in the survey booklet. This is to allow identification of variations in the questions asked of different groups. Unless otherwise indicated, questions were asked of all respondents.

Survey questions

Life satisfaction

How satisfied are you with the following aspects of your life in general (all respondents; 5-point Likert scale)

Categories were provided in the presentation of results

Work satisfaction

How important are the following aspects of your work in commercial fishing (all respondents; 5-point Likert scale)

Categories were provided in the presentation of results

How satisfied are you with each of the following aspects of your work in commercial fishing? (all respondents; 5-point Likert scale)

Categories were provided in the presentation of results

Health and health risks

Have you experienced any physical or mental health problems directly related to your work in commercial fishing (Yes/No, asked only of those who undertook work in catch or processing. Respondents asked to then describe any health problems).

In view of the challenging nature of working in commercial fishing, how much of a risk is each of the following aspects of your commercial fishing work to your health or well-being?

Categories were provided in the presentation of results

Social capital

Family and friends

Categories were provided in the presentation of results

Perceptions of fishers and fishing

Categories were provided in the presentation of results

Fishing community

Are you a member of any fishing associations/organisations/management committees? (yes/no, respondents asked to provide details of the group, whether they held an office bearing position, and number of meetings attended in last year)

Which of these tasks do you undertake in your commercial fishing work (different categories provided depending on whether business owner/manager, crew member or co-operative employee)

How did you learn your commercial fishing skills (not asked of co-operative employees)

Local community

How would you rate your local community as a place to live? (four point scale provided)

How strong are your feelings of attachment to the local community in which you live (five point scale provided)

What postcode do you live in?

How many years have you lived in your local community?

How many generations of your family have lived in the areas where you now live?

Do you expect to be living in the same place 5 years from now?

Do you usually access the following services within your local area or outside it?

Categories were provided in the presentation of results

Do you contribute to the activities/membership of any of the following types of groups?

Categories were provided in the presentation of results

Has your work in fishing led to an increase or decrease in your ability to take part in social/community activities?

Fishing history

How many years have you worked in commercial fishing?

How many generations of your family have worked in commercial fishing?

Does anyone in your household have a job outside commercial fishing?

Is your work in commercial fishing, including both paid and unpaid work – full-time or part-time/casual

Which of the following best describes your work in commercial fishing (different categories provided for owner/managers, crew members, co-operative employees)

Challenges and future of commercial fishing (not asked of co-operative employees)

Would you encourage young people to work in commercial fishing as a career?

Has it become easier or harder to enter into commercial fishing over time?

If you hadn't chosen to work in the commercial fishing sector, what type of work do you think you would have done as an alternative?

What are your intentions for the future with regard to commercial fishing? (asked only of crew members)

Categories were provided in the presentation of results

What effect do the following factors have on your decision to continue working in commercial fishing? (asked only of crew members)

Categories were provided in the presentation of results

Household spending patterns

Spending on various categories of household goods and whether spending was local or non-local

Fishing business (asked only of fishing business owners and managers)

In financial year 2003/04, in which fisheries did you hold a licence to fish?

In financial year 2003/04, what types of fishing did the fishing business you manage/work in undertake?

In financial year 2003/04, how many people worked (paid or unpaid) in your fishing business?

What was the total of the gross sales of the fishing business in financial year 2003/04?

What was the total capital value of your fishing business at June 30, 2004?

How have the following changes affected your fishing business viability?

Categories were provided in the presentation of results

Fishing business running costs

Categories were provided in the presentation of results

Demographic information

What year were you born?

What is your gender?

How many children do you have?

If you have children, how old are they?

How many of your children are financially dependent on you?

How many people other than your children, if any, are financially dependent on you?

Which of the following best describes you at present (currently married or de facto; never married or de facto; separated/divorced; widowed)

Please tick the highest formal education level you have achieved

Categories were provided in the presentation of results

In financial year 2003/04, what was your total after-tax household income (including both fishing and non-fishing income) (categories provided in \$10,000 increments)

Appendix 3: Cover letter sent to respondents

To all fishers currently receiving surveys on social contributions of fishing

We are writing to encourage you to complete and return the survey being handed out with this letter.

This survey is a vital part of efforts to understand the social impacts current fisheries management and market conditions have on fishing communities, and the ways fishers and their families contribute to coastal communities.

All four of us have been involved in designing the survey questions, and believe that if we can get everyone to fill in the surveys accurately, it will give us a lot of useful information that we can then communicate to decision makers in the fishing sector.

We are asking everyone who works in a fishing business – whether paid or unpaid – to complete a survey. Those who own a business or help manage a business should complete a ‘fishing business owners’ survey. Those who work as crew members on a boat should complete a ‘crew members’ survey.

Your survey returns will be kept completely confidential. Your name will never go on a survey, and your survey returns are being collected by the co-operative and then forwarded on to the group analysing the survey - the Bureau of Rural Sciences (BRS). In this way, the BRS will never have access to your names or know who returned which survey.

Please complete a survey and return it to LEFCOL. You can talk to any of us if you want further information about the survey, or you can call BRS on 1800 723 777 with any questions about how you should complete the survey.

Thank you for your time

[signed by four members of the local fishing community]

Appendix 4: Explanations of regional statistics data

The table below provides detailed descriptions of the statistics provided in the regional data in the report, and should be used to help assist in interpreting this data.

Statistic	Description	Source
Total population, 2001	Total population of the region on Census night in August 2001	ABS 2001 <i>Census of Population and Housing</i>
Annual population growth 1996-2001	Average annual change (%) in population between 1996 and 2001	ABS 1996, 2001 <i>Census of Population and Housing</i>
Total dependency ratio 2001	The total number of the population under the age of 15 and over the age of 65 relative to the total number of the population aged between 15 and 64	ABS 2001 <i>Census of Population and Housing</i>
Median age of total population, 2001	The 'middle' age of the population (eg if the population consisted of 1001 people, the median age would be the age of the 501 st person if the ages were ranked in order from lowest to highest)	ABS 2001 <i>Census of Population and Housing</i>
Change in the median age of total population 1996-2001	The difference between the median age of the population in 2001 and the median age of the population in 1996	ABS 1996, 2001 <i>Census of Population and Housing</i>
Sex ratio 2001	The number of males per 100 females in the region	ABS 2001 <i>Census of Population and Housing</i>
% of households earning < \$300/week, 2001	The proportion of all households in the region that earned less than \$300 per week	ABS 2001 <i>Census of Population and Housing</i>
% of households earning > \$1200/week, 2001	The proportion of all households in the region that earned more than \$1200 per week	ABS 2001 <i>Census of Population and Housing</i>
Unemployment rate, 2001	The proportion of the labour force (which is the number of people actively seeking work) without employment	ABS 2001 <i>Census of Population and Housing</i>

Change in unemployment rate, 1991-2001	Change in the unemployment rate (as defined above) between 1991 and 2001	ABS 1991, 2001 <i>Census of Population and Housing</i>
Economic diversity, 2001	The proportion of employed people employed in the 'top three' industries of employment in the region. If the number is higher, this indicates lower economic diversity as a larger number of people are dependent on the 'top three' industries.	ABS 2001 <i>Census of Population and Housing</i>
Average number of dependents per person involved in fishing	Based on respondent's reported number of 'child' and 'other' dependents. Calculated based on average of all respondents in region	Questionnaire
% of those employed in fishing sector who are members of one or more community groups	Based on proportion of respondents in the region reporting membership of one or more community groups.	Questionnaire
Average number of years and generations respondents have lived in area	Average of all respondents in that region	Questionnaire
% of respondents planning to still live in the region in 5 years time	Proportion of respondents who answered 'yes' when asked if they planned to still live in the region in five years time.	Questionnaire
Average rating of respondents of their local region as a place to live (/4)	Each respondent's rating of their local region (poor, fair, good, excellent) was converted to a 4 point scale (1,2,3,4) and the average score was calculated across all respondents in the region.	Questionnaire
Average level of attachment to local community reported by respondents (/5)	Each respondent's attachment to their local region (no attachment, little attachment, some attachment, strong attachment, very strong attachment) was converted to a 5 point scale (1,2,3,4,5) and the average score was calculated across all respondents in the region.	Questionnaire