



Released Fish
SURVIVAL

National Strategy for the Survival of Released Line Caught Fish

FINAL SURVEY OF FISHING TACKLE INDUSTRY,
RECREATIONAL FISHERIES MANAGERS AND
RECREATIONAL FISHING PEAK BODIES

Pepperell Research and Consulting Pty Ltd



infofish



Released Fish Survival
Final Survey of
Fishing Tackle Industry
Recreational Fisheries Managers
&
Recreational Fishing Peak Bodies

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- Prepared for -

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Table of Contents

Table of Contents	3
Executive Summary	4
Methods.....	9
Results	9
Use of products of strategy	14
Awareness of research studies	14
Current and anticipated use of products.....	15
In what ways have you used the results of these studies	16
If you anticipate using research results in the future, how will you do so?	16
What would you recommend for building on the strategy in the future?	16
What information gaps still exist in the field of Released Fish Survival?	17
Use of products of strategy	21
Awareness of Research Projects	22
Uptake of messages by the fishing public and by the recreational fishing industry	23
What key messages (if any) do you think have been adopted?	23
Response of industry to strategy	24
Perceived response of fishing public to strategy.....	25
Do you think the messages are being reinforced via	25
What information gaps still exist in the field of Released Fish Survival?	26
What would you recommend for building on the strategy in the future?	26
Discussion and Conclusions.....	27
Awareness of strategy and products.....	27
Use of Products	27
Industry perceptions of uptake of messages from the strategy	28
Concluding comments.....	29
Appendix I.....	30
RELEASED FISH SURVIVAL STRATEGY: AWARENESS SURVEY	30
FISHERIES AGENCIES: MANAGERS/COMMUNICATORS	30
Research Initiatives	31
Appendix II	32
RELEASED FISH SURVIVAL STRATEGY: AWARENESS SURVEY	32
RECREATIONAL FISHING INDUSTRY	32
Research Initiatives	33

Executive Summary

The National Strategy for the Survival of Released Line Caught Fish was implemented in response to the need to understand the impacts of released fish on fish stocks and to provide information to fishers on best practices in releasing fish.

Specific aims of the project were:

- To develop and implement a communication and extension program based on the current best available knowledge for releasing line caught fish by recreational fishers.
- To assess changes in different recreational sectors and regional groups on their adoption of best practice line caught release methods.

To investigate success or otherwise of the strategy, a survey was conducted among fisheries managers, key industry leaders and the fishing tackle industry

Recreational fisheries managers and peak body representatives were surveyed via email while a cross section of the recreational fishing industry were surveyed by means of face-to-face interviews at the annual Australian Fishing Tackle Association's trade show. Results may be summarised as follows:

Survey of Managers/Communicators/Peak Bodies

- There was excellent general awareness of the strategy among recreational fisheries managers and peak body representatives. All respondents were aware of the strategy, with 61% indicating that they were very aware of it. None indicated that they were unaware.
- Regarding awareness of the overall aims of the strategy and its key products, again, there was very strong recognition among respondents of the overall aims (100% aware, of which 56% were very aware). Awareness of the various products of the strategy varied, being highest for the strategy's website, statistics on released fish survival, released fish fact sheets and brochures. Somewhat lower awareness was registered for the television campaign and earlier surveys of awareness.
- Most of the main educative products of the strategy (website, fact sheets and brochures) were being consistently used by managers, communicators and peak body representatives. The exception was the video/DVD which was being moderately used.
- The research projects with which the strategy was involved were very well known by respondents.
- Over 80% of respondents said that they had used research results, which appeared to be well spread across all such studies.

- In addition to actual use so far, there was also a high anticipation among respondents that the research results from these studies would be used in the future.
- The survey indicated that managers, communicators and peak body representatives have actively promoted and/or published results of the strategy and its elements. Anticipation of use of results from the strategy was also high, especially with respect to distribution of information.
- Regarding recommendations for building the strategy in the future, two aspects were stressed: more research on survival and more promotion via various means.
- Perceived or identified information gaps identified by managers and peak body representatives focused largely on increasing the research on post release survival to cover more species, species groups or various sizes or ages within a species. Other variables identified for more research were longer time scales for studies and effects on fecundity (reproductive capacity) of released fish

Survey of Industry

- A high proportion (nearly 70%) of industry respondents were generally aware of the strategy with 25% indicating that they were very aware. Conversely, just over 30% were unaware.
- Awareness of the various products produced under the strategy varied considerably. While 62% and 71% of respondents respectively were *not* aware of the strategy's website or the video/DVD, 62% indicated that they *were* aware of the television campaign.
- News bulletins were not especially well recognized (29% overall awareness) whereas 48% were aware of released fish fact sheets. A high percentage of industry respondents (62%) were aware of statistics on survival of released fish while 55% were aware of media coverage of the strategy.
- Just under 50% of industry respondents were aware of the brochures produced under the strategy, but awareness of the earlier awareness surveys was not quite as high.
- In contrast to the managers and peak body respondents, industry respondents indicated a low usage of the various products produced under the strategy. Fact sheets were used by the highest percentage of respondents (42%) while the video/DVD had the lowest use (16% of respondents).
- The research products which were produced under or during the strategy also had a relatively low awareness within the tackle industry. Even so, about 35% of respondents were aware of studies on various fish species.

- There was a strong response within the industry that the messages from the strategy had been taken up by the general fishing public and even more so within the industry itself. Only 12.5% of respondents thought that the messages had *not* been taken up by the general public while even less (7%) thought that the messages had *not* been taken up by the industry
- There was a strong perception within industry that the message regarding better handling of fish prior to release has been widely adopted by the fishing public.
- Over 75% of industry respondents considered that sales of 'fish friendly' gear had increased as a result of the strategy (only 8% thought sales had not increased), while 70% thought that the industry had increased its promotion of best handling practices when releasing fish.
- Industry regarded the strongest reinforcement of messages regarding released fish survival to have been via print media. Television was considered intermediate while reinforcement of messages by radio was considered to have been relatively poor
- As was the case for managers, more information on post release survival for other species was seen to be an area which required more attention. There was also a general perception that continued or increased spreading of messages was needed.

Taking responses from both surveys into account, the strategy must be considered to have been very successful in meeting its objectives. Responses from all groups reflect their recognition that the active promotion of released fish survival will be an ongoing task as newcomers enter recreational fishing, technology advances and new research is undertaken.

Introduction

The National Strategy for the Survival of Released Line Caught Fish has been an initiative of the Fisheries Research and Development Corporation (FRDC) in conjunction with the Australian National Sportfishing Association (ANSA) and Recfish Australia. The strategy was implemented in response to the need to understand the impacts of released fish on fish stocks and to provide information to fishers on best practices in releasing fish. Full details of the strategy can be found in the final reports for FRDC projects 2001/099 and 2004/070.

Specific aims of the project were:

- To develop and implement a communication and extension program based on the current best available knowledge for releasing line caught fish by recreational fishers.
- To assess changes in different recreational sectors and regional groups on their adoption of best practice line caught release methods.

Under this strategy, a range of products were developed to deliver key messages on survival of released fish to the angling public. These included a detailed website, released fish fact sheets, widely distributed brochures, television announcements and inclusion in fishing shows, videos/DVDs and electronic news bulletins. During the second phase of the strategy, a number of research projects were conducted which measured the survival of released fish caught by normal angling methods. These projects covered key recreationally important species including flathead (several species) (TAS, QLD and NSW), black bream (VIC) and yellowfin bream (NSW), snapper (VIC), mulloway (NSW), barramundi (NT) and several tropical reef fish species (QLD).

This report summarises the final survey phase of the strategy. The survey was conducted among fisheries managers, key industry leaders and the fishing tackle industry to assess adoption of released fish survival data and knowledge in management arrangements, stock assessments and industry practices utilising knowledge gained from the national strategy. Specifically, the surveys were designed to determine the following:

Among both Fisheries managers and industry:

- General awareness of the national strategy on survival of released fish
- Awareness of specific components of the strategy including educational products and research initiatives.
- Identification of information gaps and recommendations for continuing and building the strategy.

Fisheries managers were also surveyed as to whether or not information from the strategy had been used in fisheries management – if so, how it has been used, and how often.

Industry respondents were also surveyed regarding their views on:

- The degree of uptake of messages from the strategy both within the industry and by the general public
- Responses of the industry with respect to sales of fish friendly gear and increased provision of information on released fish survival

Methods

Two survey instruments were designed for this study, both in the form of questionnaires for self-completion. One questionnaire was emailed to all identified recreational fisheries managers in Australia and to key peak recreational fishing body representatives. The second was emailed to representative fishing tackle industry members – retailers, wholesalers and manufacturers who are members of the Australian Fishing Tackle Association (AFTA). In the latter case, the industry survey produced a poor response rate via email return. It was therefore decided to improve response rates by conducting face to face interviews of the attendees at the annual Australian Fishing Tackle Association's trade show, held on the Gold Coast. This method had the added advantage of potentially surveying a broader cross section of the recreational fishing industry since it would include buyers and 'lookers' who were not necessarily members of AFTA. The same form as that used in the email survey for Industry was used for the face to face interviews.

Survey forms were designed and reviewed by members of the Steering Committee on Released Fish Survival before being sent out. The forms were designed to be user friendly (on screen completion and return via email), with answers to most questions being simple check boxes. Several open ended questions were included on each survey to enable individual input from respondents.

The email survey was conducted from mid June to early July 2007 while the face-to-face Tackle Show survey was conducted over the weekend of 18-19 August 2007. The questionnaires are shown in Appendix I and II.

Results

The emailed questionnaire sent to 15 managers/communicators and 13 key peak body representatives, plus two reminder emails, resulted in the return of 16 completed forms representing more than 50% of this group nationally.

As indicated in the Methods section, the email mailout to the fishing tackle industry only resulted in a small number (18) of completed forms being returned. This prompted the conducting of face to face interviews at the Australian Fishing Tackle Association's annual trade show in August 2007. Random interviews were obtained with attendees at the show and stand holders. This method resulted in 77 completed forms, for a total of 95 for the tackle industry. As a matter of interest, this compares favourably with the previous survey of industry regarding awareness of the strategy which yielded 85 fully completed forms – about 26% of the total of letters of invitation sent (Pepperell 2004).

Survey of Managers/Communicators

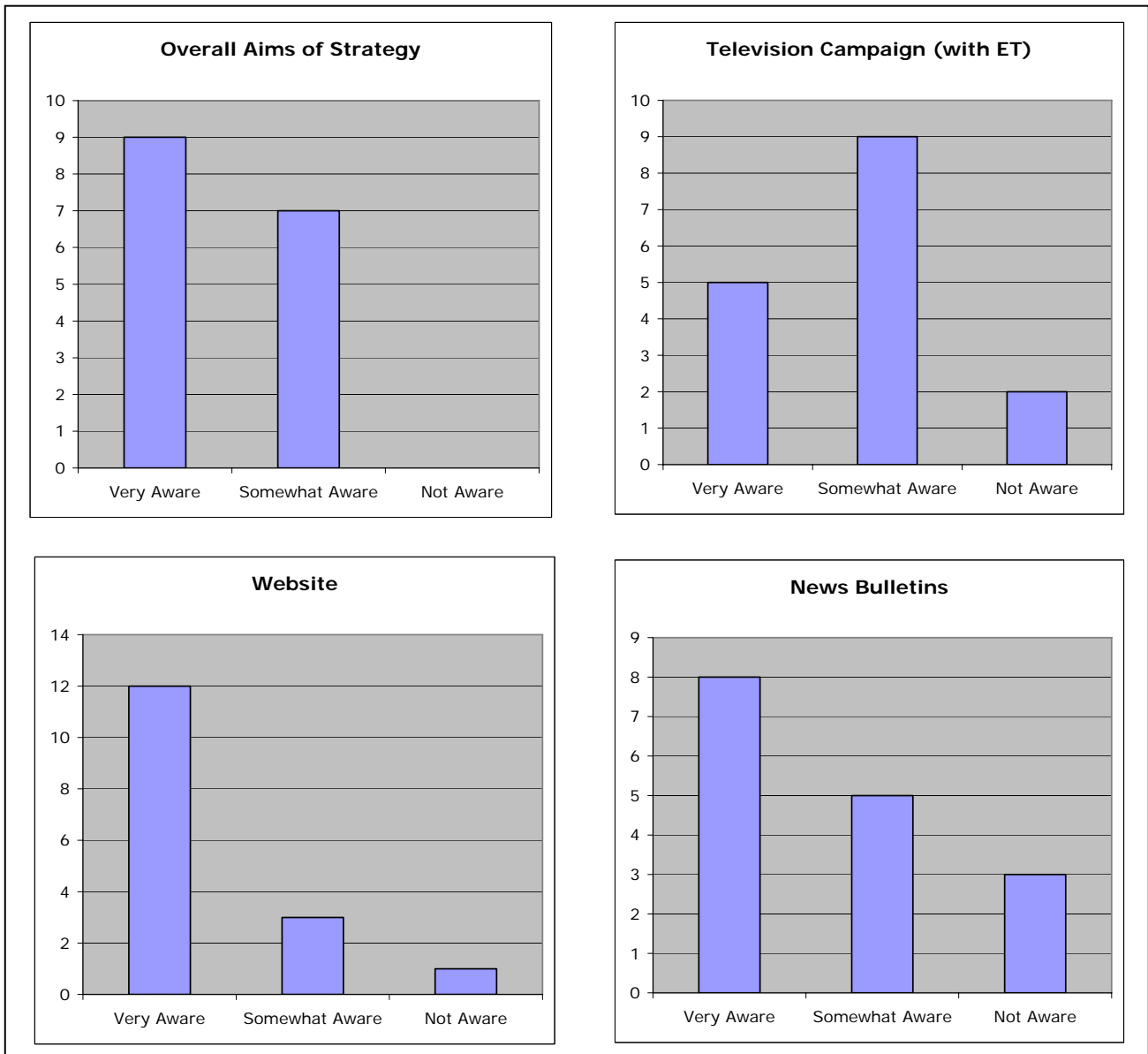
This survey was aimed specifically at specialist recreational fisheries managers or responsible officers in State and Federal Government Departments, and at spokespersons for major recreational fishing peak bodies. The results are outlined under each of the questions asked of respondents. The survey instrument is shown in Appendix I. The results of each question are represented graphically, with relevant annotations where appropriate. Figures shown on the Y-axis refer to numbers of respondents.

General awareness of National Strategy on Released Fish Survival.



There was excellent general awareness of the strategy among recreational fisheries managers and peak body representatives. All respondents were aware of the strategy, with 61% indicating that they were very aware of it. None indicated that they were unaware.

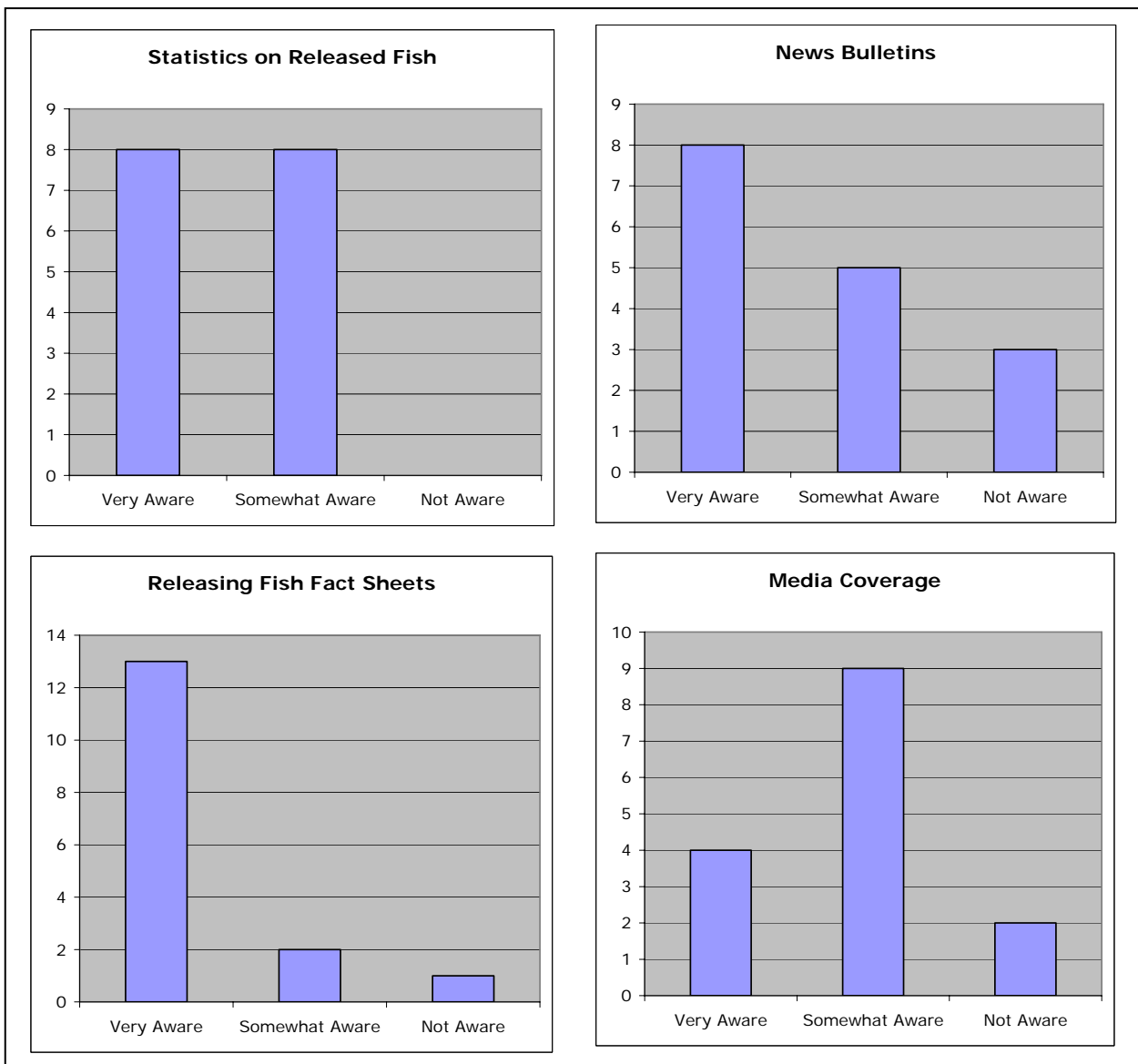
Awareness of aspects and products of the strategy



Regarding awareness of the overall aims of the strategy and its key products, again, there was very strong recognition among respondents of the overall aims (100% aware, of which 56% were very aware). Considering each product, there was very good awareness of the strategy's website (only one respondent was not aware) while the television campaign showed somewhat lower awareness (this is perhaps not surprising since the television campaign was undertaken in 2003, several years before this survey was conducted).

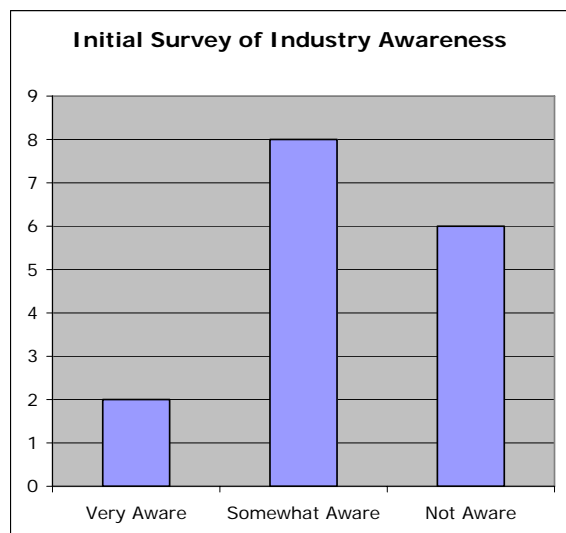
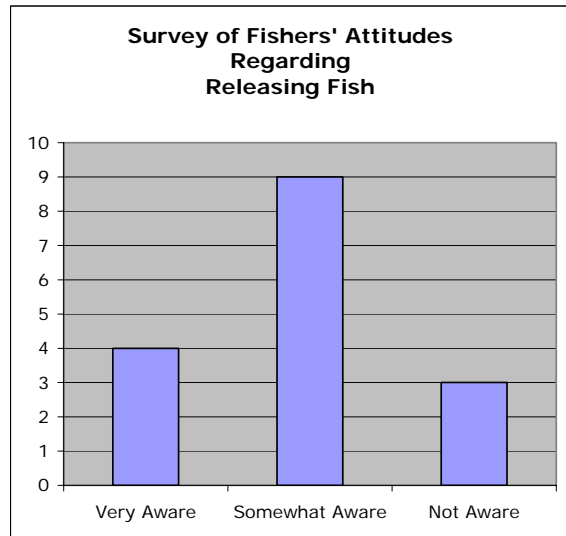
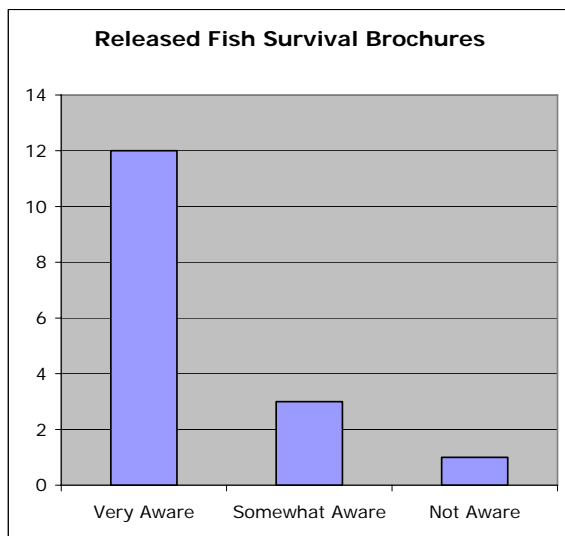
Respondents were well aware of published statistics on survival of released fish and also particularly aware of the 'Releasing Fish Fact Sheets' produced by the strategy. News bulletins also elicited a relatively high level of awareness while respondents tended to indicate less awareness of 'media coverage' of released fish survival information. Perhaps this is not so surprising since this question did not specify particular aspects of media coverage which may have prompted the respondents.

Awareness of aspects and products of the strategy (contd)



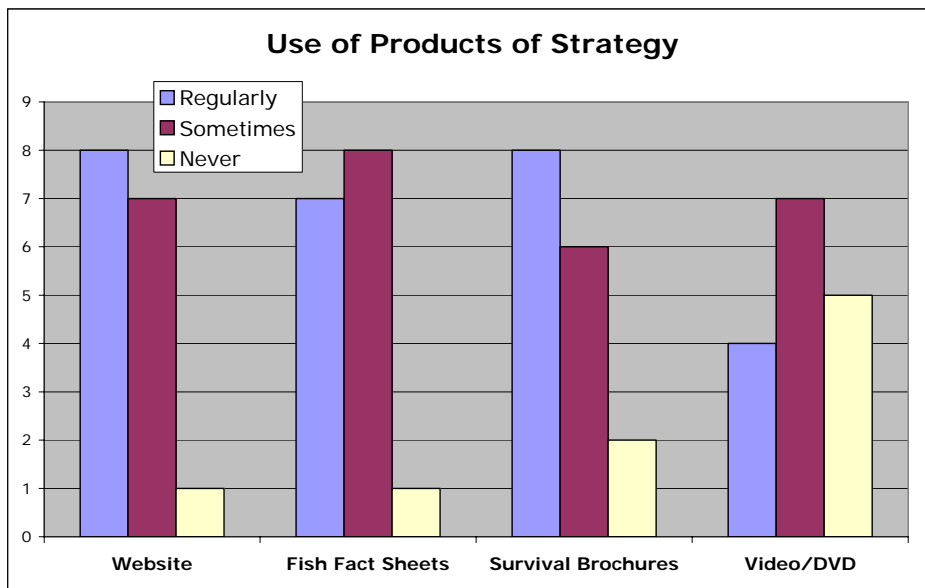
The Released Fish Survival brochures distributed under the strategy were very well recognized but respondents were less aware of the earlier survey on fishers' attitudes regarding released fish. Finally, there was not strong awareness of the earlier survey into awareness of the fishing tackle industry regarding released fish issues, information and 'fish friendly' tackle sales and use.

Awareness of aspects and products of the strategy (contd)



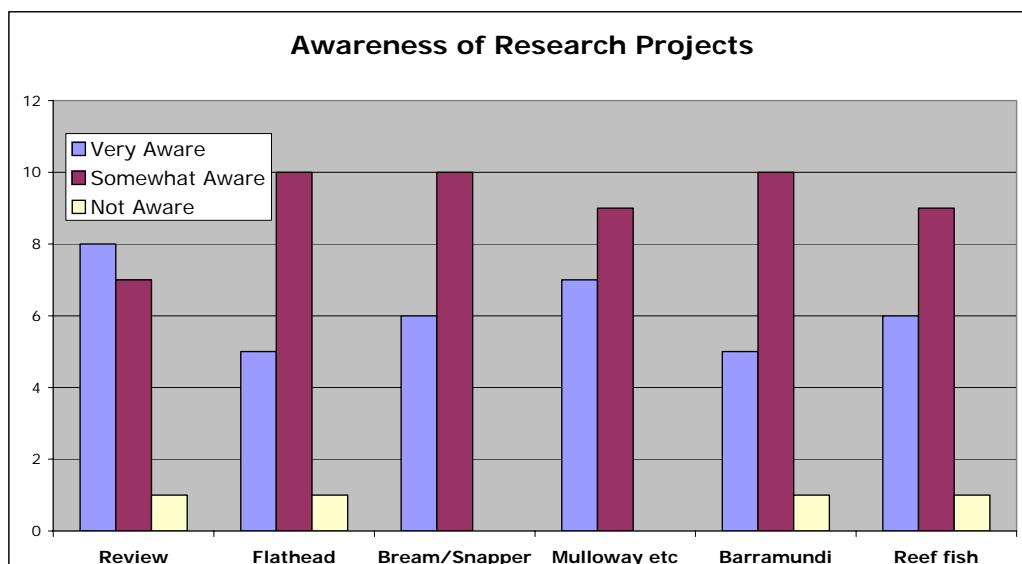
Use of products of strategy

With the results in mind of awareness of products produced by the released fish survival strategy, it is interesting to note that most of the main educational products of the strategy were being well used by the respondents to this survey (ie, managers, communicators and peak body representatives). Only one respondent had never used the website or any of the fish fact sheets while only two had never used the brochures. The video/DVD was used less than the other products.



Awareness of research studies

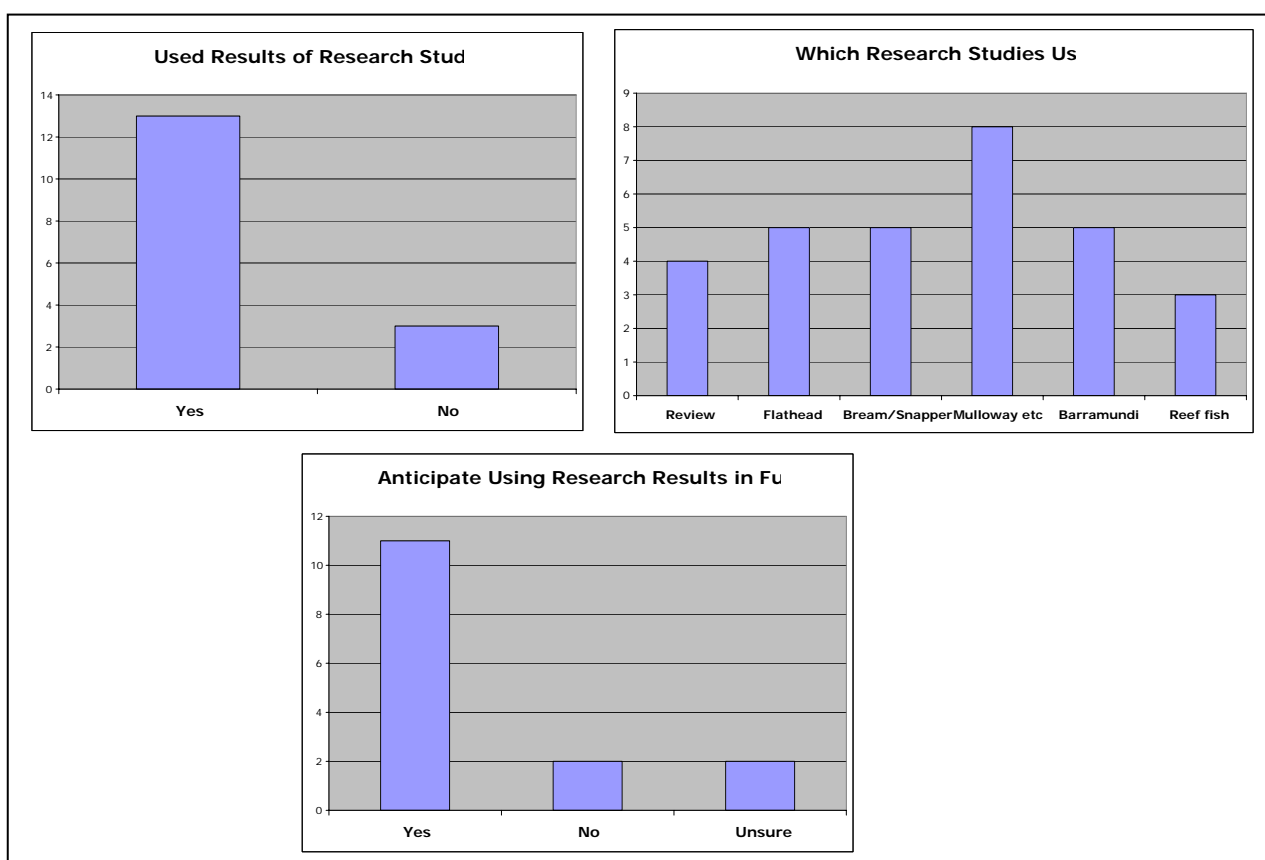
The research projects with which the strategy was involved were well known by respondents. In fact, all respondents were aware of the research projects on post release survival of bream/snapper (VIC) and mullocky, flathead and other species (NSW) while all but one were aware of the initial review of existing information, and of studies on survival of barramundi (NT), flathead (QLD and TAS) and reef fish (QLD).



Current and anticipated use of products

As well as being aware of these studies, respondents indicated that they had used the results of studies in various ways. Over 80% said that they had used research results, which appeared to be well spread across all of the studies when each was considered. The highest use of results was of those from the NSW Fisheries (DPI) on mulloway, bream, flathead etc.

In addition to actual use so far, there was also a high anticipation among respondents that the research results from these studies would be used in the future. (Only two respondents indicated that they would not be likely to use these results while another two were unsure).



Managers were asked four 'open ended' questions in order to allow personal impressions of several aspects of the released fish survival strategy. It was encouraging that most respondents did offer input to these questions, indicating that there was strong interest among the group in the use of the strategy and its future development. The questions with answers summarised below in table form.

In what ways have you used the results of these studies

Promoted/published results	9
Promote via media, meetings	3
Distributed brochures	2
Briefings for Minister	1
Developed TV ads plus own material	1
Media interviews	1
Organized speakers at mtgs	1
Promoted via website	1
Reviewing approp'ness of size limits	1
Targeted NESB* fishers	1

*Non English Speaking Background

It is clear that managers (and peak body representatives) have independently promoted and/or published results of the strategy and its elements. Use in stock assessment was not mentioned, and it may be that this point may have been better put as a set question, to determine if the results of the research projects which have quantified survival have been incorporated into stock assessments.

If you anticipate using research results in the future, how will you do so?

Distribute and publish info	7
Promote via media, meetings	5
Promote via events	1
Change management to reflect findings	1

As noted, anticipation of use of results from the strategy was high, especially with respect to distribution of information. Again, use of results from released survival experiments was not specifically mentioned.

What would you recommend for building on the strategy in the future?

More info on popular Qld species	1
Continue research on survival	1
Not much	1
More info for SA	1
Promote more to non club fishers	1
More television	1
DVDs in Mags	1
Involvement of high profile people	1
More mass media coverage	1
More communicators' engagement	1
Info in other languages	1
Gather info in one place/volume	1

Although no particular recommendation for building the strategy in the future was mentioned by more than one respondent, two aspects were stressed: more research on survival and more promotion via various means. These messages reflect the importance of recognising that the active promotion of released fish survival will be an ongoing task as newcomers enter recreational fishing, technology advances and new research is undertaken.

What information gaps still exist in the field of Released Fish Survival?

Consider more species	4
Effect of size and age on survival (eg snapper)	2
More freshwater species	2
Information on billfish	1
Desktop information on pain in fish	1
Effect of hooking on grey nurse sharks	1
Effects of hooking on large fish, such as barra	1
Long term survival studies	1
Research on effects on fecundity of released fish	1
Sheer scale of issue makes info patchy	1
Tropical reef species	1

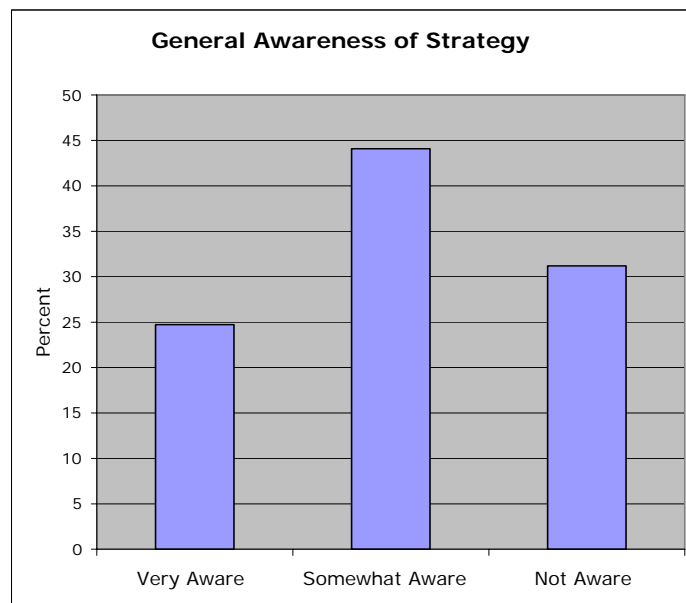
Perceived or identified information gaps identified by managers and peak body representatives focused largely on increasing the research on post release survival to cover more species, species groups or various sizes or ages within a species. Other variables identified for more research were longer time scales for studies and effects on fecundity (reproductive capacity) of released fish.

Survey of Industry

The survey of the fishing tackle industry provided robust numbers of responses from which a good understanding of awareness of the strategy by this group could be determined.

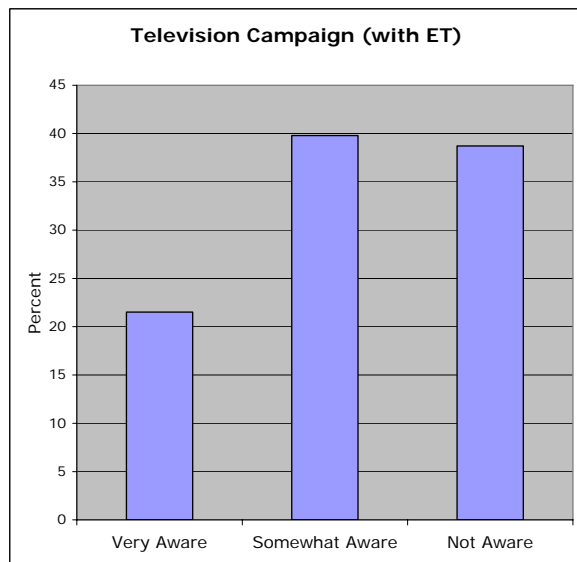
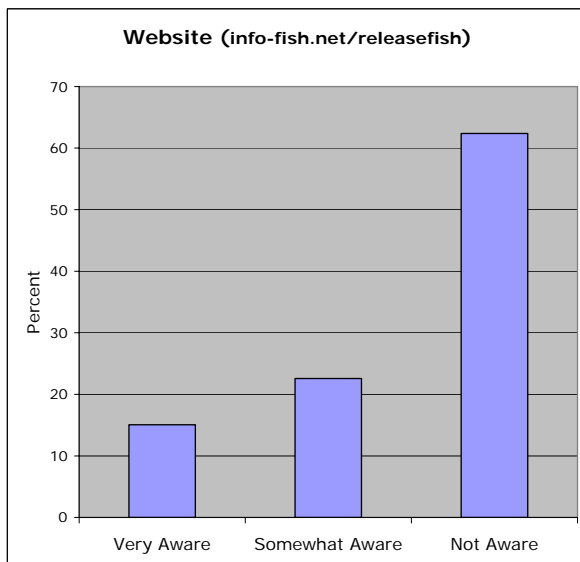
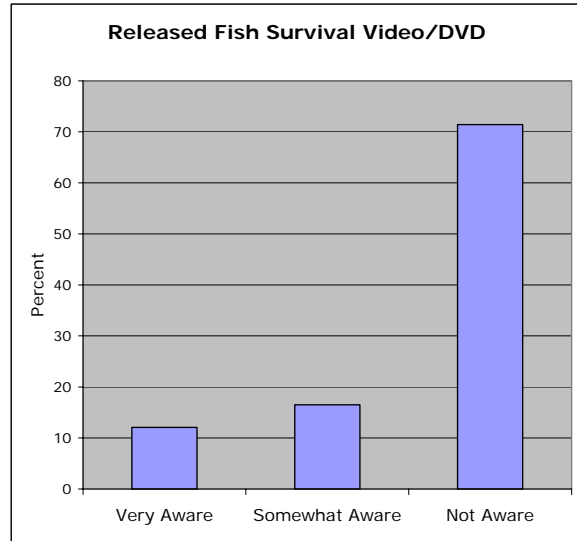
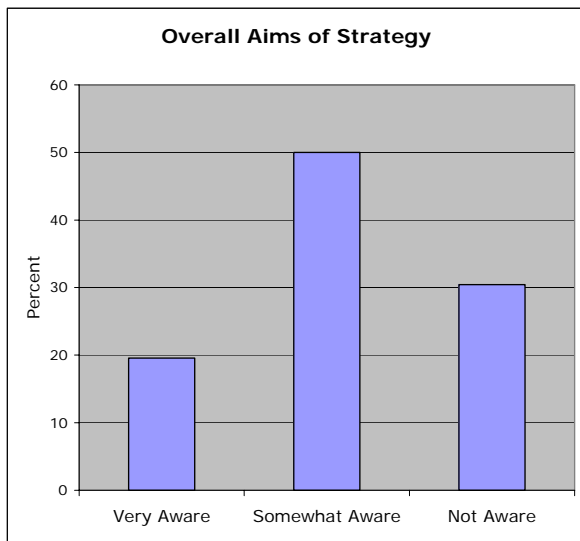
General awareness of National Strategy on Released Fish Survival.

A high proportion (nearly 70%) of respondents were generally aware of the strategy with 25% of the total indicating that they were very aware. Conversely, just over 30% were unaware.



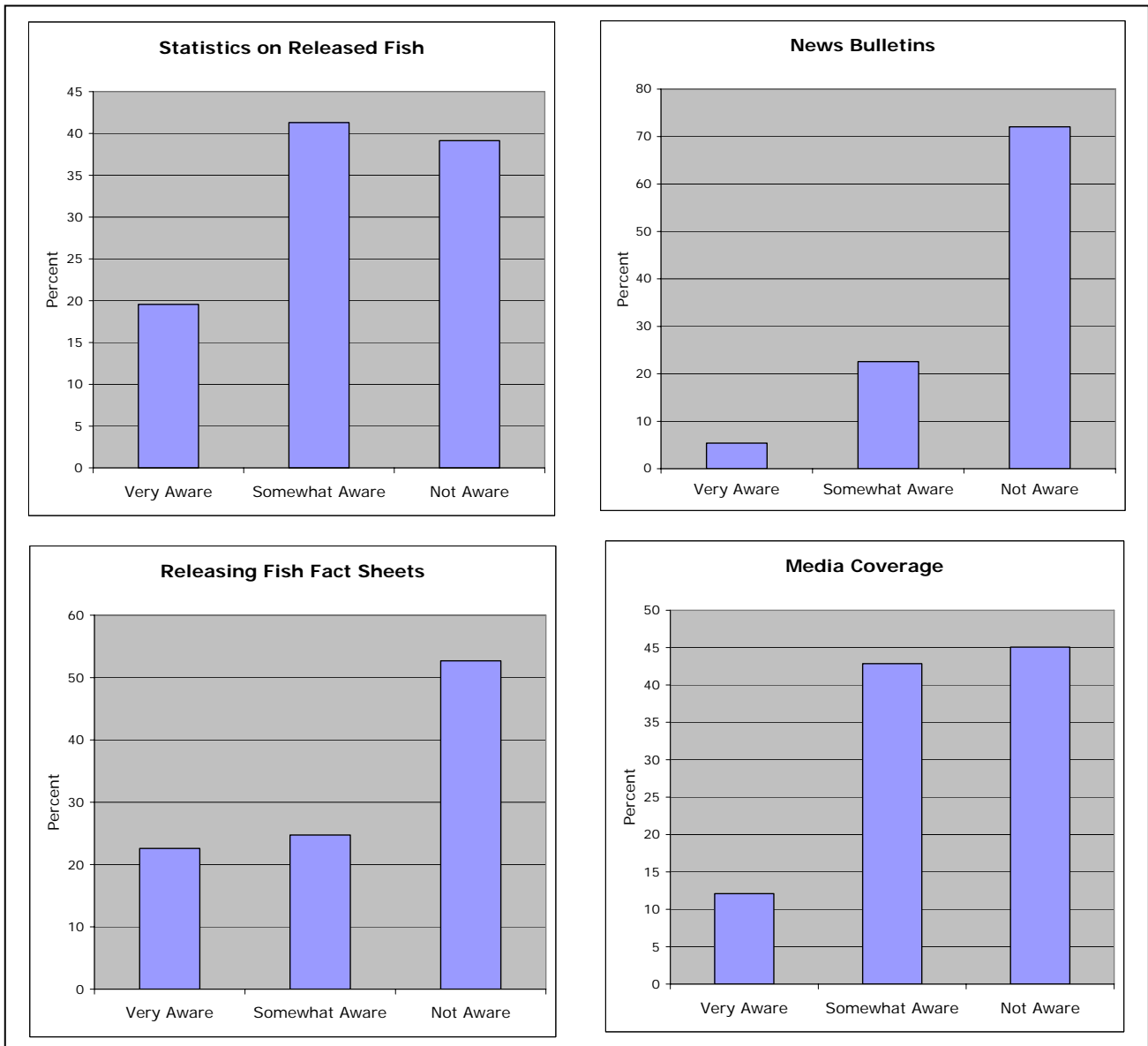
Awareness of aspects and products of the strategy.

Similarly, about 70% of respondents were aware of the overall aims of the strategy. Awareness of the various products produced under the strategy varied considerably, however. While 62% and 71% of respondents respectively were *not* aware of the strategy's website or the video/DVD, 62% indicated that they *were* aware of the television campaign.



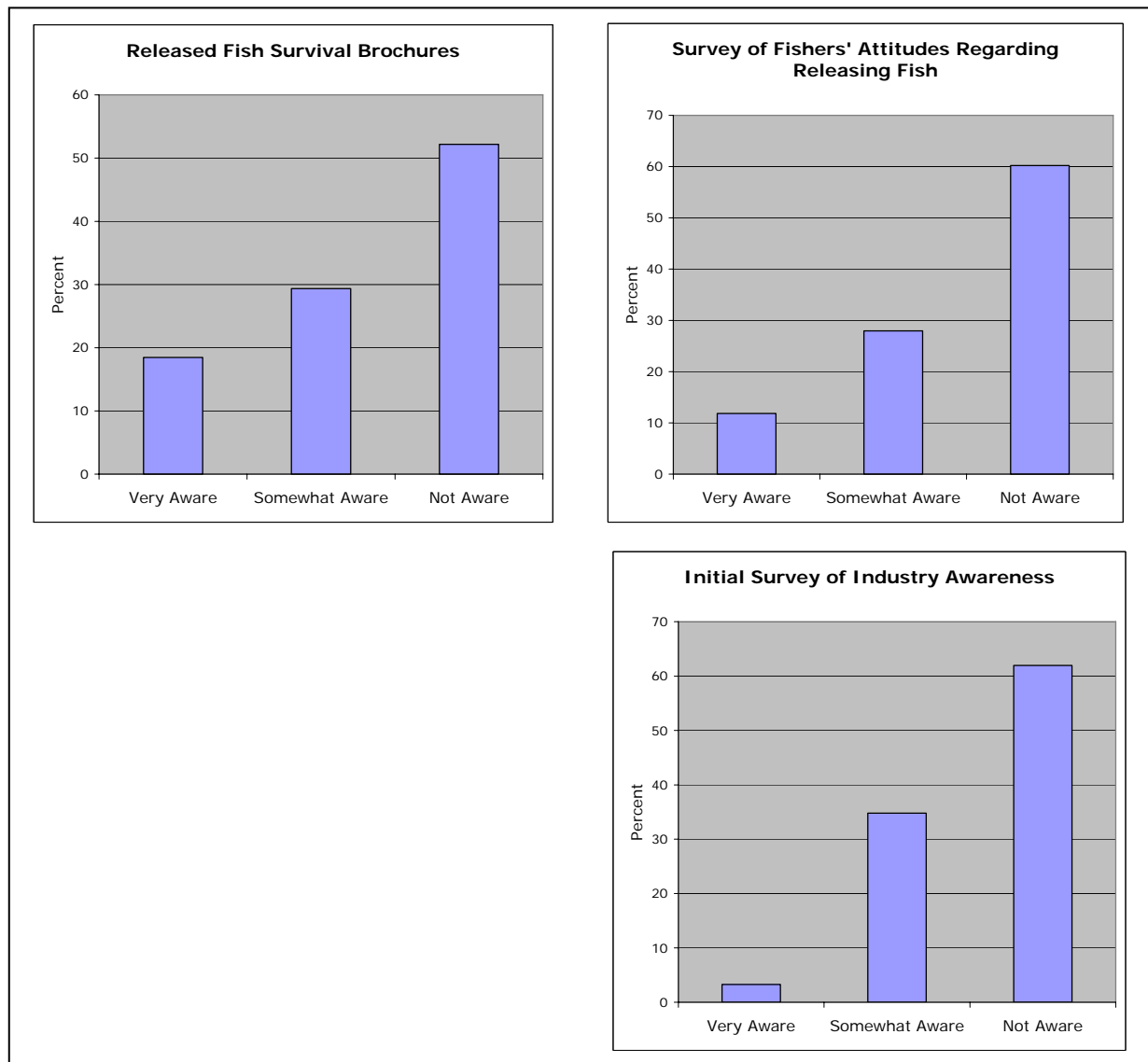
Electronic news bulletins produced under the strategy were not well recognized (only 29% overall awareness) whereas Released Fish Fact Sheets elicited a higher awareness at 48% overall. A perhaps surprisingly high percentage of respondents (62%) were aware of statistics on survival of released fish while 55% were aware of media coverage of the strategy.

Awareness of aspects and products of the strategy (contd)



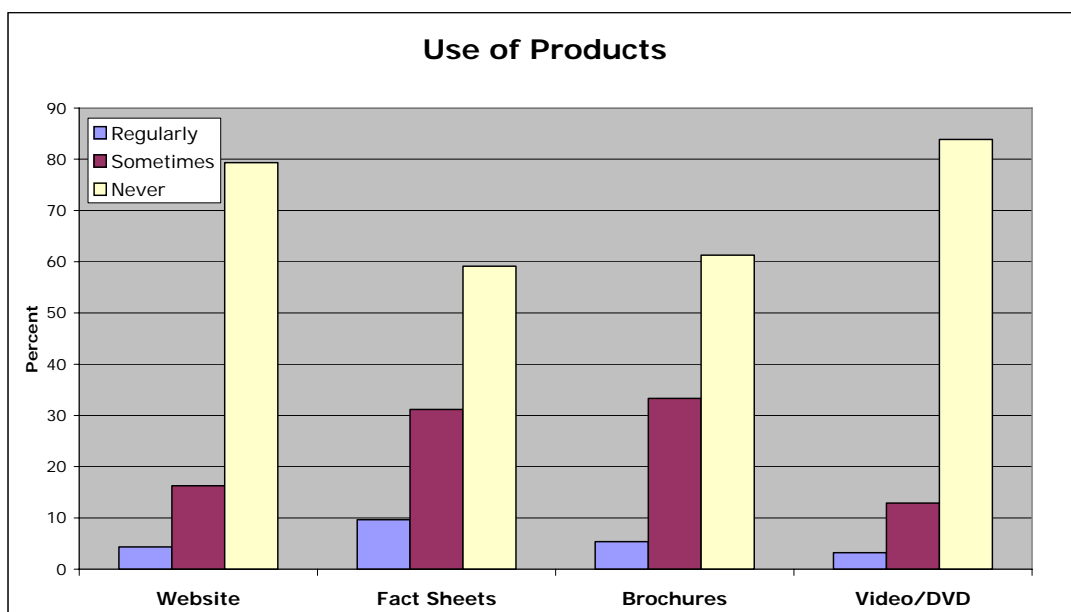
Just under 50% of industry respondents were aware of the brochures produced under the strategy, but awareness of the earlier surveys was not quite as high (60% were unaware of the survey of recreational fishers' attitudes to releasing fish while 61% were unaware of the previous survey of industry awareness).

Awareness of aspects and products of the strategy (contd)



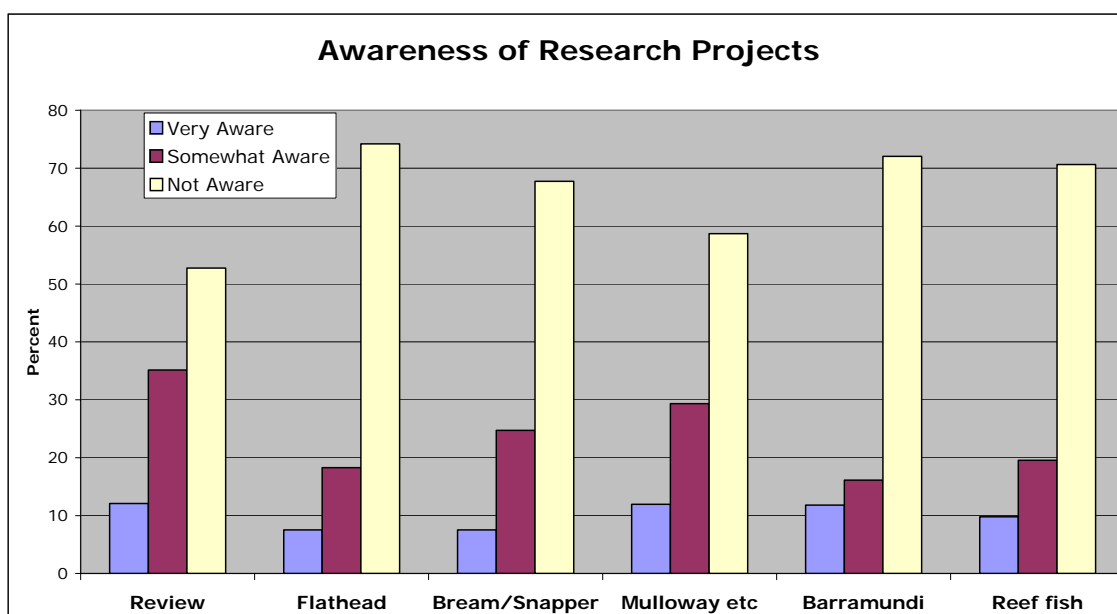
Use of products of strategy

In contrast with the managers and peak body respondents, industry personnel indicated a low usage of the various products produced under the strategy. Fact sheets were used by the highest percentage of respondents (42%) while the video/DVD had the lowest use (16% of respondents). Regular use was very low in all cases.



Awareness of Research Projects

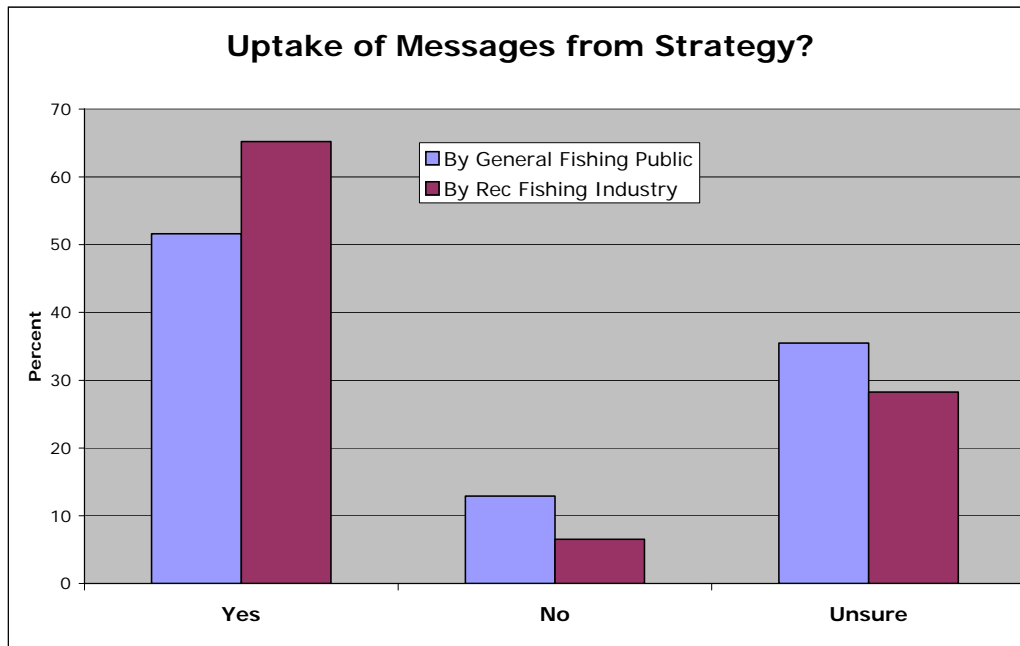
The research products which were produced under or during the strategy also had a relatively low awareness within the tackle industry. Regarding experimental work on various fish species in several States, general awareness averaged about 35% with the highest level of awareness being for the NSW Fisheries (DPI) work on post release survival of a suite of species including mullet, bream and flathead.



Uptake of messages by the fishing public and by the recreational fishing industry

A series of questions relating to the uptake of messages by the public and by the tackle industry elicited the following results.

There was a strong feeling in the industry that the messages from the strategy had been taken up by the general fishing public and even moreso within the industry itself. Only 12.5% of respondents thought that the messages had *not* been taken up by the general public while even less (7%) thought that the messages had *not* been taken up by the industry. Even so, about 30% were unsure about this question.



Recreational fishing industry respondents were asked the following open question

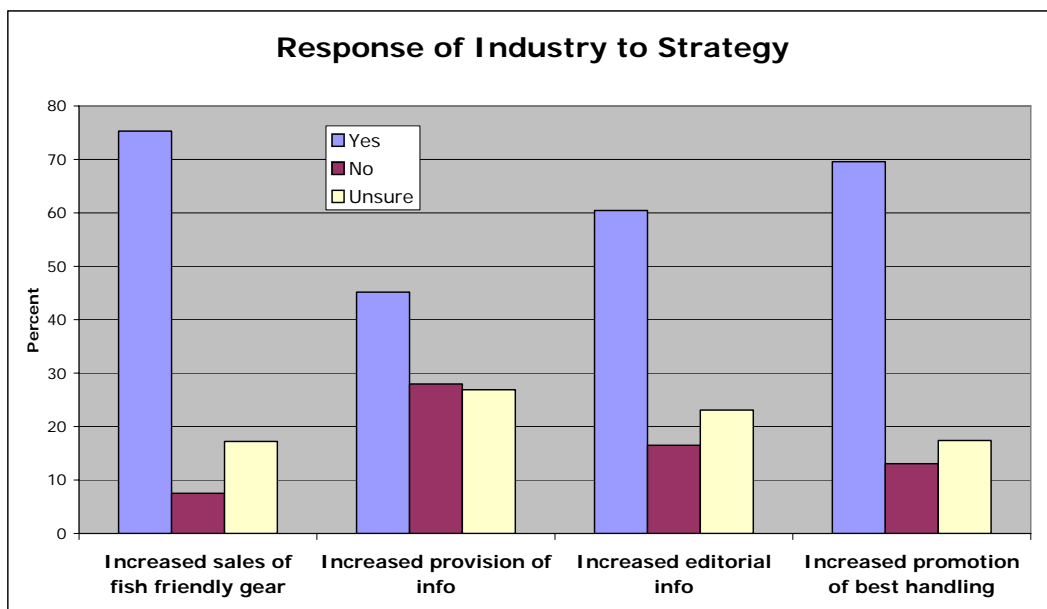
What key messages (if any) do you think have been adopted?

Proper/better handling of fish	20
Need to fish for the future	7
General awareness	6
Importance of sustainability of resource	5
Circle hooks	4
Fish friendly landing nets	4
Cutting line on deep hooked fish	2
Use of grips	2
How to deal with barotrauma	1
Shortening fighting times	1
Survival of fish information	1

A smaller proportion of fishing tackle industry personnel responded to open ended questions than did managers, but responses were nevertheless very useful. In this case, it is clear that there is a strong perception that the message regarding better handling of fish prior to release has been adopted by the fishing public. The need to look after fishery resources was also seen as a widely adopted message from the strategy. As well, a range of practical messages about specific gear or handling tips were also perceived as being taken up by fishers.

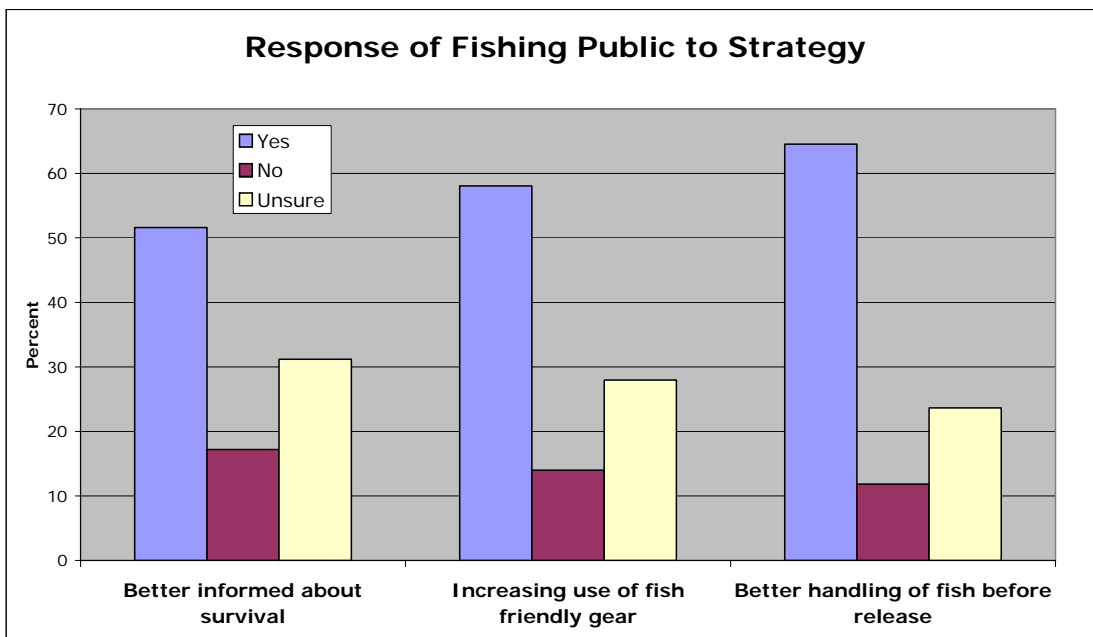
Response of industry to strategy

Members of the tackle industry were generally very positive about their industry's responses to the strategy. Over 75% considered that sales of 'fish friendly' gear had increased as a result of the strategy (only 8% thought sales had not increased), while 70% thought that the industry had increased its promotion of best handling practices when releasing fish. The highest negative response in this respect was in relation to the provision of information to the public on released fish survival. In this regard, 28% of respondents thought that this had not increased. This result should not be surprising, however, since tackle retailers' core business is selling fishing gear, tackle, bait and related info and advice - not spreading information on released fish survival and similar messages. Therefore, it is to be expected that there will be a wide range of awareness and engagement in spreading these sorts of messages to the fishing public. Nevertheless, these tackle stores will continue to be the most logical and cost-effective delivery points for such messages, requiring improved communication with them and provision of information products that suit their various needs and operating styles.



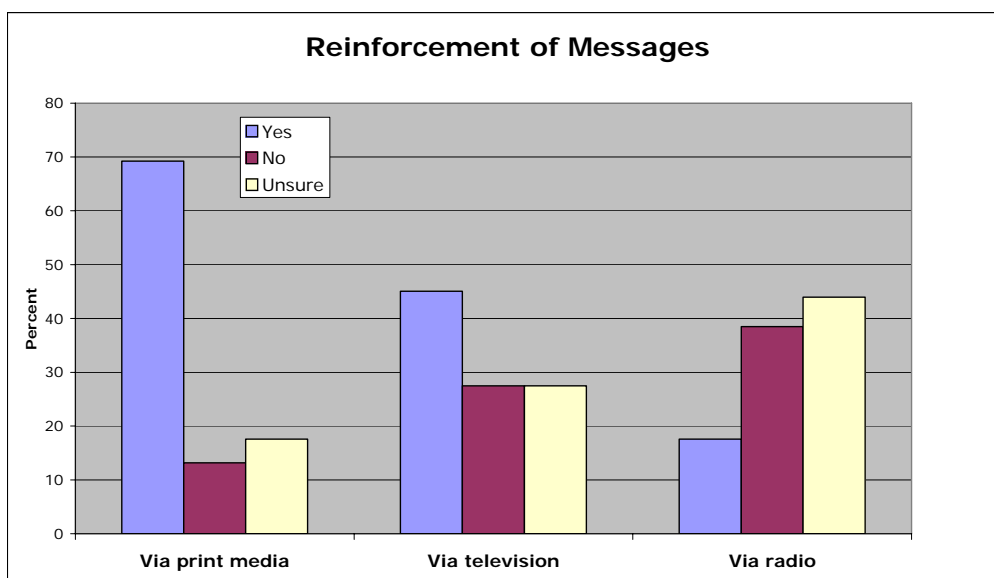
Perceived response of fishing public to strategy

Because members of the fishing tackle industry deal with the general fishing public on a daily basis, they were also asked about their perceptions of the response of the public to the strategy. Again, responses were positive, with over 50% considering that the public was now better informed about survival of released fish, 58% thinking that there was an increased use of fish friendly gear and 65% considering that there had been an improvement in handling fish before release. Perhaps surprisingly, there were relatively high 'unsure' responses for each category.



Do you think the messages are being reinforced via ...

Regarding the reinforcement of messages regarding released fish survival, it is clear that the industry regarded the strongest reinforcement by far to have been via print media. Television was considered intermediate while reinforcement of messages by radio was considered to have been relatively poor (albeit, with the highest percentage being unsure).



The second open ended question to industry related to perceived information gaps, viz:

What information gaps still exist in the field of Released Fish Survival?

More specific info in different species	8
Better distribution of info	5
None. Job well done	4
Aim at those who don't use media	3
Not enough through retail shops	3
Another reinforcement campaign	1
Effects of soft plastics on survival	1
Face to face contact still important	1
Info on large pelagics	1
Long term survival research	1
More info on barotrauma	1
More info on tagging	1
Need more publications	1
Review size limits	1

As was the case for managers, more information on post release survival for other species was seen to be an area which required more attention. There was also a general perception that continued or increased spreading of messages was needed. This need was also stressed in responses to the next question:

What would you recommend for building on the strategy in the future?

Increase awareness/simplify message	15
More media/web reinforcement	10
Direct messages through retailers	8
Target younger groups	4
Distribute info with fishing licences	3
Easier access to statistics	3
Keep pushing messages	3
More funding for more research	3
More info on tag and release	2
Use tournaments to reinforce	2
Work with TV producers	2
Continued partnership with AFTA	1
Deliver face to face	1
Increase awareness of commercials too	1
More info at popular fishing spots	1
More use of guides for data	1
Multi lingual exposure	1
More restocking	1

Again, there was a strong feeling that increased dissemination of information would help to reinforce the groundwork of the strategy. As indicated above, several useful suggestions regarding vehicles for dissemination of information were offered.

Discussion and Conclusions

The results of the parallel surveys of managers and industry indicated somewhat differing levels of awareness of the released fish survival strategy among different groups with close connections to recreational fishing. In general, managers and peak body representatives had very high awareness of most aspects of the strategy and had used, and/or intended to use results in the future. In comparison, recreational fishing industry respondents had a somewhat lower awareness of the strategy, although the strategy, its overall aims and a number of its products were well recognized .

It is useful here to make some specific comparisons between the two groups surveyed.

Awareness of strategy and products

All of the managers and peak body representatives were aware of the released fish survival strategy, while nearly 70% of industry members were aware. Similarly, all managers were aware of the strategy's overall aims compared with 70% of industry respondents. Some major differences in awareness were apparent for some products of the strategy. For example, over 90% of managers/peak body reps were aware of the released fish survival website, compared with only 38% of industry members. Similarly, 81% of managers/peak body reps were aware of news bulletins while only 27% of industry indicated their awareness of these. On the other hand, awareness within the industry of the television campaign (with ET) was high, at 62% (87.5% of managers/peak body reps) as was awareness of statistics on released fish survival (61% among industry. 100% among managers/peak body reps). One group of products which may have been expected to have relatively high industry awareness were the released fish survival brochures. Many thousands of these were distributed via a number of avenues, and awareness by industry respondents was reported at 48% – a good result considering the broad scope and spread of the fishing tackle industry.

Regarding awareness of research products, again managers and peak body reps had a very high awareness of all of the indicated research studies (95 – 100%) whereas awareness of these studies within the industry was much less (27 – 41%).

Use of Products

As might be expected from their overall awareness of the strategy and its products, most managers and peak body reps indicated that they had made use of the various products and research results. The only product with less than 90% use was the video/DVD which had still been used by 69% of respondents. As might be expected, industry members used the products of the strategy far less. The highest use was for the released fish fact sheets and the brochures (41% and 40%

respectively) while the lowest use was of the video/DVD (17% used) and the website (20.5% used).

Overall, this is a very gratifying result. The extremely high awareness and knowledge of the strategy and all of its parts among managers and peak body representatives indicates that the tactic of targeting these groups with continually updated information was very successful. In comparison, it is not surprising that overall awareness among industry members was considerably lower than that of managers since the industry is so disparate in its components and so widely dispersed geographically. Nevertheless, nearly two thirds of industry respondents were generally aware of the strategy and its aims and at the least, nearly 30% were aware of all products.

Interestingly, fisheries managers did not specifically mention the application of the results of studies on survival of various species to stock assessments, although it was clear that results from these studies were used in unspecified ways. The use of survival data in stock assessments was thought to be an important use of such data. It is possible that this has in fact occurred in some jurisdictions, or that stock assessments have not been carried out on the species which have been studied so far. This is therefore an area which would benefit from further investigation into specific uses to which these data have been put, or are intended to be put.

Industry perceptions of uptake of messages from the strategy

There was a strong indication from industry that the messages from the strategy had been taken up by the general fishing public (52% thought this) and by the industry itself (65%). In fact, the negative responses to this question were very low, while around a third of respondents were unsure one way or another.

There was also a very strong perception within industry that sales of fish-friendly gear had increased as a result of the strategy (75% thought this) while nearly 70% thought that industry had also responded by increasing their promotion of better handling practices when releasing fish. Not surprisingly, these perceptions also applied to the increased use of fish friendly gear among the fishing public, and in the adoption of better fish handling practices. (Of interest here is the fact that the level of awareness of the strategy and its products was very similar to that measured in a survey of industry in 2004. SOME DETAIL This indicates that many of the messages have had long term uptake.

Finally, the reinforcement of messages from the strategy was thought by most respondents to have been strongest through the print media.

Key messages, information gaps and recommendations for the future

The key messages which the Industry respondents considered to have been adopted by the angling public were: better handling of fish prior to release and the concomitant need to properly care for fishery resources. A range of practical messages about specific gear or handling tips were also perceived as being taken up by fishers, including more widespread use of circle hooks and knotless landing nets, and cutting line when releasing deeply hooked fish.

Both managers and industry saw the need for increased research on post-release survival as a significant remaining knowledge gap. Specific species or species groups identified were large pelagic fish, freshwater fish, grey nurse sharks, more tropical reef species and large barramundi while long term studies and studies on sublethal effects of hooking were also suggested. (Interestingly, whiting were not mentioned even though these species are caught and released in large numbers and no specific studies were initiated on them under the strategy). More studies in Queensland and South Australia were also suggested. There was also a general perception that continued or increased spreading of messages derived from the strategy was an ongoing need.

Regarding recommendations for future building of the strategy's work and messages, both managers and industry strongly felt that that increased dissemination of information was most important. A range of useful suggestions for dissemination of information were offered including the dissemination of DVDs in magazines, greater mass media coverage (rather than just the 'captive' fishing media), information to be available in other languages, more information available at popular fishing locations, distribution of information with fishing licences, more web reinforcement and greater involvement of fisheries communicators in spreading the messages.

Concluding comments

The twin surveys of recreational fisheries managers/key peak body representatives and the fishing tackle industry have clearly indicated that the products, research initiatives and messages derived from the National Strategy for Survival of Released Line-Caught Fish have been widely understood and adopted by these groups and by the general fishing public. Uptake and use of messages and results by managers and peak body representatives has been extremely high, while penetration of the recreational fishing industry has also been excellent. Perceptions by industry that the strategy has greatly enhanced attitudes of the fishing public towards releasing fish, with consequent increased sales of fish-friendly gear, are very strong all of which indicate that the strategy must be considered to have been very successful in meeting its objectives. Responses from all groups reflect their recognition that the active promotion of released fish survival will be an ongoing task as newcomers enter recreational fishing, technology advances and new research is undertaken.

Appendix I

Survey questionnaire sent to Fisheries Managers and Peak Bodies

RELEASED FISH SURVIVAL STRATEGY: AWARENESS SURVEY

FISHERIES AGENCIES: MANAGERS/COMMUNICATORS

The National Strategy for the Survival of Released Line-Caught Fish has been a Fisheries Research & Development Corporation (FRDC) funded project since 2001/2002. It will conclude in June 2007. We are interested in ascertaining awareness and application of the Strategy in Australian recreational fisheries. Your feedback is important and much appreciated. Where comments are requested, feel free to type as much as you like.

1. Are you generally aware of the National Strategy on Released Fish Survival?

☐ Very aware ☐ Somewhat aware ☐ Not aware

2. How aware are you of the parts of the Strategy, listed below? ...

Overall Aims of the Strategy	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Website (info-fish.net/releasefish)	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Statistics on released fish	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Releasing Fish Fact Sheets	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Released Fish Survival Brochures	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Released Fish Survival Video/DVD	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Television Campaign (with 'ET')	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
News Bulletins	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Media Coverage	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Survey of Attitudes towards Releasing Fish	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Initial Survey of Industry Awareness	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware

3. How often have you made use of any of the following products of the Strategy?

Website (info-fish.net/releasefish)	<input type="checkbox"/> Regularly	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Never
Releasing Fish Fact Sheets	<input type="checkbox"/> Regularly	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Never
Released Fish Survival Brochures	<input type="checkbox"/> Regularly	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Never
Released Fish Survival Video/DVD	<input type="checkbox"/> Regularly	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Never

Research Initiatives

4. How aware are you of each of the Strategy's research products listed below?

Review of research & fishery information on survival of released fish ¹	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Flathead post release survival (TAS and QLD) ²	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Post release survival of bream and snapper (Victoria) ³	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Post release survival of mulloway, bream, flathead, whiting etc (NSW) ⁴	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Post release survival and stress physiology of barramundi (NT) ⁵	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Reef fish survival project (QLD/WA) ⁶	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware

5. Have you used the results of any of the studies listed above? ☐Yes ☐No

6. If yes, which one(s)?

7. In what ways have you used the results of these studies?

8. Do you anticipate using the results of any of these studies in the future? ☐Yes ☐No ☐Unsure

9. If yes, how?

10. What would you recommend for building on the Strategy in the future?

11. What information gaps still exist in the field of Released Fish Survival?

12. Please indicate your title/position

References for Question 4.

1. McLeay LJ, Jones GK and Ward TM (2003). National strategy for the survival of released line-caught fish: A review of research and fishery information. FRDC Project 2001/101. ISBN 0730852830.

2. Lyle, JM, Brown IW, Moltzchanivskyj NA, Mayer D and Sawynok W (2007). Maximising Post-Release Survival in Line Caught Flathead taken in Sheltered Coastal Waters. FRDC Project 2004/071. ISBN 1 86295 369 4

3. Conron S, Gixti D and Morison A (2005). Assessment of mortality of under-size snapper and black bream caught and released by recreational fishers. Primary Industries Research Victoria, Queenscliff. ISBN 1 74146 935 X

4. Broadhurst, M et al (2003-2007). Various studies of survival of released fish. Species: Mulloway, yellowfin bream, dusky flathead, silver trevally, snapper and sand whiting. NSW DPI reports.

5. Paul de Lestang, Roland K Griffin and Quentin A Allsop (2004). Assessment of the Post-Release Survival and Stress Physiology of Barramundi (*Lates calcarifer*). FRDC 2002/039, Final report.

6. Brown, IW et al (current). Preliminary results from FRDC project 2003/019. National strategy for increasing the survival of released line-caught fish: tropical reef species: Coral trout, red emperor, redthroat emperor, saddletail snapper, crimson snapper, spangled emperor.

Appendix II

Survey questionnaire sent to Fisheries Managers and Peak Bodies

RELEASED FISH SURVIVAL STRATEGY: AWARENESS SURVEY RECREATIONAL FISHING INDUSTRY

The National Strategy for Survival of Released Line-Caught Fish has been a Fisheries Research & Development Corporation (FRDC) funded project since 2001/2002. It will conclude in June 2007. We are interested in ascertaining awareness and application of the Strategy in Australian recreational fisheries. Your feedback is important and much appreciated. Where comments are requested, feel free to type as much as you like.

1. Are you generally aware of the National Strategy for Survival of Released Line-Caught Fish?

☐ Very aware ☐ Somewhat aware ☐ Not aware

2. Please indicate below what parts of the Strategy you are aware of.....

Overall Aims of the Strategy	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Website (info-fish.net/releasefish)	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Statistics on released fish	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Releasing Fish Fact Sheets	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Released Fish Survival Brochures	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Released Fish Survival Video/DVD	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Television Campaign (with 'ET')	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
News Bulletins	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Media Coverage	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Survey of Fishers' Attitudes towards Releasing Fish	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Initial Survey of Industry Awareness	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware

3. Have you made use of any of the following products of the Strategy?

Website (info-fish.net/releasefish)	<input type="checkbox"/> Regularly	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Never
Releasing Fish Fact Sheets	<input type="checkbox"/> Regularly	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Never
Released Fish Survival Brochures	<input type="checkbox"/> Regularly	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Never
Released Fish Survival Video/DVD	<input type="checkbox"/> Regularly	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Never

Research Initiatives

4. Looking at the following list, can you indicate which of these research projects you are aware of?

Review of research & fishery information on survival of released fish ¹	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Flathead post release survival (TAS and QLD) ²	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Post release survival of bream and snapper (Victoria) ³	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Post release survival of mulloway, bream, flathead, whiting etc (NSW) ⁴	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Post release survival and stress physiology of barramundi (NT) ⁵	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware
Reef fish survival project (QLD/WA) ⁶	<input type="checkbox"/> Very aware	<input type="checkbox"/> Somewhat aware	<input type="checkbox"/> Not aware

5. Do you think there has been an uptake of the messages from the Strategy ...

By the general fishing public? ☐Yes ☐No ☐Unsure
By the recreational fishing industry? ☐Yes ☐No ☐Unsure

6a. Do you think the recreational fishing **industry** has responded to the Strategy by

Increased stocking & sales of fish friendly gear (eg. circle hooks, landing nets, grips, hookouts etc)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unsure
Increased provision of information on survival of released fish	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unsure
Increased editorial information on survival of released fish	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unsure
Increased promotion of best fish handling practices	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unsure
Other			

6a. Do you think the recreational fishing **public** has responded to the Strategy by

Being better informed about survival of released fish	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unsure
Increasing use of fish friendly gear	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unsure
Better handling of fish before release	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unsure
Other			

7. Do you think the messages from the Strategy are being reinforced ...

Via print media (esp. fishing magazines)? ☐Yes ☐No ☐Unsure
Via television ☐Yes ☐No ☐Unsure
Via radio ☐Yes ☐No ☐Unsure

8. What key messages (if any) do you think have been adopted?

9. What information gaps still exist in the field of Released Fish Survival?

10. What would you recommend for building on the Strategy in the future?

11. Please mark the box which best describes your role in the recreational fishing industry/community

Retailer	<input type="checkbox"/>
Wholesaler	<input type="checkbox"/>
Journalist	<input type="checkbox"/>
Peak body representative	<input type="checkbox"/>

References for Question 4.

1. McLeay LJ, Jones GK and Ward TM (2003). National strategy for the survival of released line-caught fish: A review of research and fishery information. FRDC Project 2001/101. ISBN 0730852830.
2. Lyle, JM, Brown IW, Moltzchaniwskyj NA, Mayer D and Sawynok W (2007). Maximising Post-Release Survival in Line Caught Flathead taken in Sheltered Coastal Waters. FRDC Project 2004/071. ISBN 1 86295 369 4
3. Conron S, Gixti D and Morison A (2005). Assessment of mortality of under-size snapper and black bream caught and released by recreational fishers. Primary Industries Research Victoria, Queenscliff. ISBN 1 74146 935 X
4. Broadhurst, M et al (2003-2007). Various studies of survival of released fish. Species: Mulloway, yellowfin bream, dusky flathead, silver trevally, snapper and sand whiting. NSW DPI reports.
5. Paul de Lestang, Roland K Griffin and Quentin A Allsop (2004). Assessment of the Post-Release Survival and Stress Physiology of Barramundi (*Lates calcarifer*). FRDC 2002/039, Final report.
6. Brown, IW et al (current). Preliminary results from FRDC project 2003/019. National strategy for increasing the survival of released line-caught fish: tropical reef species: Coral trout, red emperor, redthroat emperor, saddletail snapper, crimson snapper, spangled emperor.