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Aquatic Animal Welfare in Perspective

An initiative of the Aquatic Animal Welfare Working Group of the Australian Animal Welfare Strategy

Aquatic Animal Welfare Working Group

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In submitting this report, the researcher has agreed to FRDC publishing this material in its edited form.

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Acknowledgments

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The AAWWG also acknowledges the contribution on a voluntary basis of the many commercial fishers, recreational fishers, aquaculturalists and aquarium fish wholesalers who provided invaluable input into the various guidelines and practices developed as part of the various projects referenced in this report. This contribution included substantial vessel time at sea, crew and time meeting with researchers during trials of the proposed guidelines and practices.

Membership of the Aquatic Animal Welfare Working Group is set out in Attachment 1

Abbreviations

AAWS	Australian Animal Welfare Strategy
AAWWG	Aquatic Animal Welfare Working Group
FRDC	Fisheries Research and Development Corporation
RSPCA	Royal Society for the Prevention of Cruelty to Animals

Executive Summary

This project results in a document providing a *'one-stop-shop'* outlining the process entered into by the Aquatic Animal Welfare Working Group (AAWWG) to look at a pragmatic way to address the issue of fish welfare in the aquatic animal sector in Australia.

The Australian Animal Welfare Strategy (AAWS) was an Australian Government initiative that aimed to protect and promote the welfare of all Australian animals, including aquatic animals.

Working groups were established for six animal sectors as part of the AAWS process. This included the Aquatic Animal Welfare Working Group. The Aquatic Animal Welfare Working Group identified four sectors under the *'aquatic'* heading:

- Commercial fishing
- Recreational fishing
- Aquaculture
- Ornamental / Aquarium industry

Representatives from each of the national peak bodies for each *aquatic* sector joined with representatives from Animals Australia, RSPCA, state governments and independent animal health science to fill the membership up the Aquatic Animal Welfare Working Group.

Defining what constitutes fish welfare is difficult. Broadly, animal welfare deals with the humane treatment of animals and most of the principles for animal welfare have emerged primarily through *terrestrial* animals.

Fish on the other hand are complex creatures and importantly are *poikilothermic*, meaning that their internal body temperature is not maintained at a constant temperature, as in terrestrial animals. Fish also occupy a diverse range of habitat and ecological niches.

Importantly the AAWWG decided very early in their considerations:

- the issue of '*do fish feel pain'* was moot when all the science was taken into account and ongoing debate would be circular, unhelpful and progress would be stymied;
- existing sector codes of practices and guidelines designed to maximise fish quality were extremely well placed in meeting fish welfare outcomes;
- to concentrate on *'vertebrates'* as knowledge around invertebrates was extremely scarce and inconclusive.

The AAWWG agreed that their outcome expectation was to *'minimise stress from capture to slaughter'.* This outcome expectation was felt to be something to which all sectors could aspire and could practically work towards implementing.

The AAWWG agreed to a simple set of priority-based steps to work through:

- Undertaking a stock-take of existing animal welfare practices in the aquatic sector to understand where the sectors were situated at the time;
- Conducting workshops with various sectors to initiate consideration and conversation on aquatic animal welfare:
- Establishing a set of Overarching Principles for animal welfare against which the various sectors could assess and review existing specific best practice guidelines practiced by their respective sector stakeholders;
- Assisting sectors to establish specific 'guidelines' for their operations;
- Road-testing the guidelines in practice within sectors to provide working examples for wider stakeholders; and,
- Communicating and promoting the principles, guidelines and templates to the broader aquatic community for application across the various sectors.

A series of dedicated projects were developed and approved by the AAWWG with funding provided from the Australian government, FRDC and direct contributions from commercial fishers, recreational fishers, aquaculturalists and aquarium fish wholesalers. The projects followed the priority list and findings from one project were used to inform the next project in that area of consideration. The AAWWG now has a range of findings that, when combined, produce a valuable series of practical outcomes and materials for circulation and use within the various aquatic sectors. These findings are now centralised in this report.

The maturity of the AAWWG to set aside debate on *'do fish feel pain'* and concentrate on practical outcomes to '*minimise stress from capture to slaughter'* allowed this aquatic sector and animal welfare advocates to proceed relatively smoothly along the path of improving fish welfare in the various sectors.

It was recognised that there is a very close relationship between minimising stress in fish and the quality outcomes of the final product. The commercial fishing and aquaculture industries have applied this approach for many, many years and their existing practices, although not labelled specifically for *'animal welfare'*, results in relatively high fish welfare results.

The process followed by the AAWWG since 2005 has demonstrated that operational processes need to have flexibility to ensure sectors can '*minimise stress from capture to slaughter'.* A fishing operation that catches larger volumes of small fish will require handling methods that can minimise stress across the whole catch as quickly as possible (eg use of ice slurry) rather than using stunning or brain spiking on an animal by animal basis which is more effectively achieved with smaller volumes of larger fish and in recreational fishing.

Following the untimely demise of AAWS in 2013 the members of the Aquatic Animal Welfare Working Group (AAWWG) agreed to continue on a *'voluntary basis'*, especially as several projects were underway or had funding approved and were about to commence.

The last of these projects was only completed at the end 2015.

The take-up of these outcomes and materials now lies with the four sectors to which they apply – commercial capture fishing, aquaculture, recreational fishing, ornamental fish and restaurants holding live fish.

Keywords

Minimise stress from capture to slaughter,

Overarching principles for aquatic animal welfare,

Australian Animal Welfare Strategy

Introduction

The Australian Animal Welfare Strategy (AAWS) was an agreed blueprint for animal welfare in Australia that commenced in 2005 and aimed to enhance welfare outcomes for all animals.

This strategy continued until the withdrawal of operational funding by the incoming government in 2013.

Six broad animal sector working groups were established as part of the strategy, including the Aquatic Animal Welfare Working Group.

The Aquatic Animal Welfare Working Group (AAWWG) identified four sectors under the *'aquatic'* heading:

- Commercial fishing
- Recreational fishing
- Aquaculture
- Ornamental / Aquarium industry

Representatives from the national peak body for each *aquatic* sector joined with representatives from Animals Australia, RSPCA, state governments and independent animal health science to fill the membership up the Aquatic Animal Welfare Working Group.

This document provides a 'one-stop-shop' outlining the process entered into by the Aquatic Animal Welfare Working Group (AAWWG) to look at a pragmatic way to address the issue of fish welfare in the aquatic animal sector.

Whether fish can suffer and are sentient beings with conscious perception are questions that are central to the issue of fish welfare. Davie and Kopf (2006) noted that in order to suffer, an animal must possess a sensory system able to detect noxious stimuli and importantly the brain must consciously perceive the stimuli as negative.

If fish do not suffer then there are no welfare issues with capturing, killing or releasing fish.

However, there is considerable debate in the scientific literature regarding the ability (or not) of fish to "suffer" or feel pain. Rose *et al.* (2014), in their review of the issue of whether fish feel pain, concluded that they were unlikely to. These authors also concluded that the rationale and supportive evidence for the existence of consciousness in fishes was not compelling, nor neurologically feasible.

Other authors do not agree with these conclusions, arguing that there is growing evidence that teleost fish can feel pain (for example see Torgersen *et al.* 2011) with Lund *et al.* (2007) stating that sentience in fish cannot be ruled out based on review of the scientific literature. Huntingford *et al.* (2006) notes that, while the neocortex is lacking in fish and because of this it may be argued that fish cannot suffer, an alternative view is that complex animals with sophisticated behavior (such as fish) probably have the capacity for suffer though this may be different in degree and kind from the human experience of this state. Brown (2014), in his review of the current state of knowledge on fish cognition and the evidence for pain perception, concludes that the evidence strongly suggests fish are sentient and capable of feeling pain.

It is quite clear when reviewing the literature on this topic that the debate involving scientific and philosophical arguments is sometimes confused by emotional responses, to paraphrase Turnbull (2010).

Ongoing scientific debate about whether or not fish can feel pain could be used to justify a delay in examining welfare issues in all aquatic animal sectors. The ambiguity in the science certainly means that any considerations should be taken cautiously.

But people's attitudes (and for "people" we are talking about the general public who pay for the fish caught in the commercial capture fishing sector) are not necessarily based on science. Lund *et al.* (2007) argues that the immediate question is an ethical one – we must consider how probable sentience in fish must be shown to be before we feel obliged to act.

As Bekoff (2007) noted, it is important to blend 'science sense' with common sense.

As noted in Kaiser and Huntingford (2009) (and agreed within the Aquatic Animal Welfare Working Group), product quality is the important driver in commercial fisheries. Handling techniques that simultaneously improve product quality and the welfare of the animals offers a *clear win–win situation*.

Importantly the AAWWG decided very early in their considerations:

- the issue of '*do fish feel pain'* was moot when all the science was taken into account and ongoing debate would be circular, unhelpful and progress would be stymied;
- existing sector codes of practices and guidelines designed to maximise fish quality were extremely well placed in meeting fish welfare outcomes;
- to concentrate on *'vertebrates'* as knowledge around invertebrates was extremely scarce and inconclusive.

The AAWWG agreed that their outcome expectation was to *'minimise stress from capture to slaughter'.* This outcome expectation was felt to be something to which all sectors could aspire and could practically work towards implementing.

Objectives

- Achieve sustainable improvements in animal welfare based on national and international benchmarks, scientific evaluation and research, taking into account changes in whole of community standards.

- Achieve effective communication, education and training across the whole community to promote an improved understanding of animal welfare.

- To ensure that new knowledge gained through research on animal welfare is broadly communicated and adopted into national animal welfare standards.

- To promote ownership and responsibility by the whole of the Australian community of the benefits of the Strategy.

Method, Results and Discussion

A Stocktake of Existing Aquatic Animal Welfare Rules and Practices

An initial stocktake of the existing aquatic sector animal welfare rules and applied practices was identified as the logical starting point for the AAWWG so as to understand;

- what was already available within the various sector groups;
- where there were gaps; and,
- how might those gaps be filled.

The first stage of this project was to compile an inventory of current relevant animal welfare documentation with respect to finfish in Australia through a stocktake.

The Australian Constitution does not mention animals or their welfare. Hence, each State and Territory is responsible for its own animal welfare legislation. A review of State and Commonwealth government arrangements with respect to animal welfare indicated the significant variation between legislation and regulations.

Varying levels of guidelines, codes of practice, codes of conduct or management strategies that specifically focus on the welfare aspects of wild harvested or aquaculture fish were identified in the preparation of this report. Many quality control manuals and environmental management systems, especially in the commercial fishing and aquaculture sectors, did provide substantive animal welfare benefits even though animal welfare was not the specific objective of those documents.

The national representative bodies for the aquaculture, ornamental and recreational sectors demonstrated that they had introduced voluntary codes of practice that specifically covered the treatment of fish after capture. The recreational sector is actively involved in research on improving fish welfare particularly with catch and release techniques that aim to increase survivability of fish returned to the sea.

The gaps identified from this stocktake project included:

- The absence of specific animal welfare guidelines in some of the individual sectors (eg commercial wild capture);
- The extent to which existing sector Codes of Practices and guidelines are disseminated and subsequently used;
- Availability of guidelines or specific operating procedures for restaurant owners that assists then to address fish welfare issues; and,
- The lack of audit concerning the welfare of fish.

A copy of the final stocktake project report is available at:
http://frdc.com.au/environment/welfare/Documents/Aquatic%20Animal%20Welfare%20WG%20Stocktake%20Report%20%28Final%29%20Sept%2006.pdf

Establish the '*Overarching Principles for Aquatic Animal Welfare*'

The AAWWG concluded that consistent legislation across the nation was preferred but was not something they could greatly influence in the near future.

The AAWWG recognised that there was general support across the aquatic sectors to minimise stress on fish albeit the reasons for this objective were not always specifically for animal welfare. More often the approach was to maximise the quality of the fish for sale, personal consumption or for better growth and feed conversion efficiencies for fish that are farmed.

The AAWWG agreed that by assisting the various aquatic sectors participants to maximise their specific objectives for improving their handling of fish (eg quality or growth), *the animal*

welfare benefits would also be maximised.

The AAWG decided to established a set of *'Overarching Principles for Aquatic Animal Welfare'* to be used by the various sectors as the basis upon which to build a consistent approach for their sector's specific best practice guidelines to achieve animal welfare.

The *'Overarching Principles'* were developed by means of consultation using the extensive networks of the respective national sector organisations. Once finalised the *'Overarching Principles'* were re-distributed through the same national sector networks in an effort to assist sectors to review and amend existing documentation within their industry or to establish bespoke guidelines to improve fish welfare within their stakeholder group.

A copy of the *'Overarching Principles'* is available at: http://frdc.com.au/environment/welfare/Documents/Agreed%20Overarching%20Principles%202009.pdf

Research Projects

During the initial stages of the process the AAWWG identified several priority research areas that would add immediate value in support of the *'Overarching Principles'* and bridge the gap between theory and practice within the aquatic sectors including:

- Impacts of stress from capture to slaughter;
- Product quality; and,
- Fish welfare in aquaculture.

Project 1. Benchmarking harvest methodologies in the Australian barramundi aquaculture industry – impacts on stress, product quality and fish welfare

Many authors refer to the five freedoms (Mellor & Stafford, 2001), whereby to guarantee good welfare animals should be free from:

- hunger and thirst;
- undue environmental challenge;
- disease and injury;
- behavioural restriction; and,
- mental suffering

The various merits or values of these five freedoms as they relate to fish in aquaculture have been extensively debated in the literature.

The aims of this study were to:

- Compare current harvest methodologies employed by a range of commercial barramundi farms and determine effects on the physiological stress response and flesh quality in fish;
- Identify critical control points in harvest which may be contributing to reductions in product quality attributes; and,
- Collate information and suggest cost-effective industry best practice methodologies for the maintenance of product quality attributes.

In general terms present day aquaculture places great emphasis on culture techniques with the aim of enhancing growth rates and production efficiency. However, on occasion, the importance of harvest as the final stage in production is overlooked. It is well known that harvest should be a process where fish are treated with the greatest care to minimise stress prior to slaughter to avoid issues such as a rapid drop in muscle pH due to increased lactic acid from white muscle anaerobic metabolism. A decreased muscle pH results in a rapid

onset of rigor mortis and may also cause reduced shelf-life, increased muscle gaping and blood spotting, flesh texture alterations and reduced water holding capacity of the muscle.

Minimisation of stress during harvest will satisfy both animal welfare and product quality objectives, with good welfare, good production and quality being intrinsically linked (Poli *et al*., 2005). Clear links between pre-harvest stress and post-harvest flesh quality have been established for other commercial fish species, however this is an area for barramundi aquaculture in Australia where knowledge gaps currently exist.

There is a range of harvest techniques in use within the Australian barramundi industry. In order to ensure the future competiveness of Australian grown barramundi there is considerable value in benchmarking harvest techniques and developing industry best-practice protocols to ensure the maintenance of product quality between producers. In addition this will improve the fish welfare during the harvest process.

Barramundi responded with a traditional stress response (at least in terms of cortisol and glucose production) during crowds on commercial farms. This seems to be in-line with other commercially farmed fish however the magnitude of the response was *'moderate'* and is in agreement with suggestions that barramundi are relatively robust when it comes to dealing with husbandry stressors in aquaculture.

The cause of fish loosing equilibrium (i.e. going 'belly-up') in the crowd should be investigated further, however at least in the limited number of fish sampled in this study, loosing equilibrium was not associated with increases in blood lactate or decreases in blood pH. Compared to the relatively moderate increases in cortisol and glucose levels in the blood stream a reduction in flesh pH at harvest is likely to have a much larger impact on post-harvest flesh quality. It would be relatively easy for larger farms to routinely measure flesh pH, together with blood glucose and lactate (using handheld meters) and blood pH during harvests as potential indicators of stress and quality.

An additional aim for this project was to collate information and suggest cost-effective industry best practice methodologies for the maintenance of product quality attributes. Given the limitations of this study and relatively preliminary nature of trials to date, suggesting specific industry best practice methodologies is somewhat difficult. However a series of future recommendations were provided:

*1. Further investigations of on-farm harvest procedures and attempts to capture stress and quality information from a wider range of commercial operation*s - how fish respond to harvest stressors (from both a behavioural and physiological perspective) during periods of cooler water temperatures may differ during periods of the year when water temperatures are much warmer. Further work therefore should attempt to gain information from a wider range of commercial operations from different times of the year to account for seasonal variation;

2. Establishing clear links between crowd density and duration with the stress response and product quality - a strong focus on future research work and for commercial producers should centre on the crowding process employed;

3. Further investigation of rested harvest and stunning techniques - future work should continue investigations into the practical and cost-effective application of rested harvest on farms together with other harvest methods (i.e. percussive stunning, brain spiking and dry-electrical stunning). Reducing behavioural responses and apparent exhaustion during the crowd by the use of AQUI-S and inducing insensibility to direct ice transfer will no doubt result in beneficial welfare and quality outcomes;

4. Studies investigating the impacts of starvation on the response to harvest stress -

previous work in other fish species indicates pre-harvest processes like starvation during purging may enhance, suppress or have minimal effect on how a fish may respond to husbandry related stressors;

5. Further work on direct ice transfer - further research could make use of sophisticated methods such as EEG and ECG (combined with traditional behavioural and physiological measures) to investigate brain and heart activity of fish subjected to direct ice transfer; and,

6. Investigations into the respiratory system, lactate production and pH buffering systems in barramundi – this may be of particular relevance in fish which appeared to be suffering from exhaustion (ie going belly-up) in the crowd.

A copy of the final project report is available at:
http://frdc.com.au/environment/welfare/Documents/AAWS%20Barra%20Project%20-%20Final%20Report.pdf

Project 2. Humane dispatch of fish – *Ike Jime* (brain spike) method
Previous research had identified that rapid slaughter of finfish using this 'brain spike' method results in improved fish welfare outcomes, as well as improved flesh quality and the potential for extended shelf life.

The AAWWG found that resources which demonstrate to fish harvesters accurate *'how to'* information on the *iki jime* procedure were non-existent. Fish brains are small and vary in location between species groups. This information gap was considered a barrier to the widespread uptake of the *iki jime* method amongst groups such as recreational anglers.

The project undertook morphological investigations using x-ray and dissection to pinpoint the brain location of over 80 species from 33 families of marine, freshwater and estuary finfish most commonly cultured and targeted by fisheries throughout Australia, New Zealand and the Asia/Pacific region. Brain locations were superimposed graphically on colour photographs of the exterior of each fish.

A copy of the final project report can be found at either:
http://frdc.com.au/environment/welfare/Documents/Aquatic%20Animal%20Welfare%20WG%20Stocktake%20Report%20%28Final%29%20Sept%2006.pdf

http://www.digsfish.com/AW1011-08FinalReport.pdf

The project developed a range of materials available to the community including:

- **YouTube video** was produced and can be found at https://www.youtube.com/watch?v=cBAzhUiJ4ys

- **Website** - with interactive photograph/ radiograph overlays revealing the brain location of each fish species (http://www.ikijime.com/)

- **Hard copy pamphlets** - across the range of aquatic vertebrate species:
    - Freshwater species pamphlet
      http://frdc.com.au/environment/welfare/Documents/Iki%20Jime%20-%20Freshwater%20leaflet%202013.pdf

    - Estuary species pamphlet
      http://frdc.com.au/environment/welfare/Documents/Iki%20Jime%20-%20Estuary%20leaflet%202013.pdf

- Offshore marine pamphlet http://frdc.com.au/environment/welfare/Documents/Iki%20Jime%20-%20Offshore%20leaflet%202013.pdf

- Literature review underpinning the pamphlets can be found at www.digsfish.com/AW1011-08Literaturereviewfinal.pdf

- ***Iki Jime Tool Series*** for phone apps for Apple and Android phones http://frdc.com.au/environment/welfare/Documents/Iki%20jime%20Poster%20-%20Phone%20App.pdf

- ***Apple***
  - *Iki Jime Tool* https://itunes.apple.com/au/app/ikijime-tool/id704308194?mt=8
  - *Iki Jime Tool Lite* https://itunes.apple.com/au/app/ikijime-tool-lite/id704317893?mt=8
  - *Iki Jime Tool Extreme* https://itunes.apple.com/au/app/ikijime-tool-extreme/id704317983?mt=8

- ***Android***
  - *Iki Jime Tool Lite* https://play.google.com/store/apps/details?id=com.ikijimetoollite
  - *Iki Jime Tool* https://play.google.com/store/apps/details?id=com.ikijimetool
  - *Iki Jime Tool Extreme* https://play.google.com/store/apps/details?id=com.ikijimetoolextreme

- A paper describing the process through which the website and phone apps were developed subsequent to the AAWS project is in early view at http://onlinelibrary.wiley.com/doi/10.1111/fme.12127/abstract

There has been several thousand downloads of the free versions of the phone apps and, together with the website content, these materials have been critically acclaimed internationally *(eg - winning best poster presentation at the 7th world recreational fishing conference in Brazil)*.

The project manager received funding from the NSW Recreational Fishing Trust in 2015 to update the website and phone apps to include a *"search by region"* function identified as needed as the number of fish in the database increased.

Project 3. Fish welfare guidelines for seven (7) 'commercial' fishing capture methods
The AAWWG accepted the advice from the commercial fishing industry representatives that there is a close relationship between aquatic animal welfare and existing industry handling techniques to maximize quality of seafood products.

The main commercial capture fishing sector methods identified were:
- Line - hand, drop, longline;
- Trawl - otter, beam, stern;
- Pot &Trap;
- Seine - beach, purse, Danish; and,
- Net - Gill / Mesh

An experienced commercial fisher in each of these capture fishing methods was nominated by an industry peak body to assist in the initial drafting of each method's best practice guidelines. A consultant, engaged to write the initial draft of each set of guidelines,

accompanied fishers on several fishing trips to ensure that the content of the animal welfare guidelines did not contradict anything that the industry applied in practice.

A critical aspect of the guidelines was that they aligned with the *Aquatic Animal Welfare – Overarching Principles (see above)*.

A copy of the draft guidelines was then forwarded to the nominated fisher who had assisted in it's development for critical review and comment as well as to several other fishers across Australia that operated in each of the particular capture methods.

All the capture sector method guidelines have been written in a similar format.

Each State/Commonwealth fishing industry peak body was asked to co-ordinate access to the guidelines for each capture method for industry stakeholders in their jurisdiction. This was best achieved through the posting of the guidelines on their websites supported by a series of short articles in their electronic newsletters.

Subsequently several state fisheries management agencies have also posted the guidelines on their websites or provided links.

A copy of the all the guidelines referred above is available at: http://frdc.com.au/environment/welfare/Pages/Aquatic%20Animal%20Welfare%20-%20Research.aspx

Project 4. Humane Euthanasia Techniques for Ornamental Fish

This project undertook a review of Humane Euthanasia Techniques for Ornamental Fish.

Ornamental fish are defined as fish that are kept at home either as aquarium or pond fish. The vast majority of these fish are less than 30cm in size, and in fact most are under 15cm in size.

The aim of the project was to identify a variety of techniques and practical methods to euthanize ornamental fish, make this information available to the owners of such fish and improve animal welfare for fish being euthanized.

A comprehensive literature review was undertaken together with a process contacting international ornamental fish industry organisations to determine the science and techniques available for humane euthanasia of ornamental fish.

It was found that there is a lack of readily available information in Australia on humane euthanasia techniques for dealing with ornamental fish.

The literature search revealed very little data specific to the euthanasia of ornamental fish species with one exception. That exception is the zebrafish (*Danio rerio*) - a small tropical aquarium fish that in the past twenty years has become a major medical and biological research animal.

Given this dearth of specific information, other methods were considered. In evaluating these other various methods of euthanasia several criteria were used including:

- the method needed to cause a rapid loss of consciousness - followed by death,
- the method was reliable and irreversible; and,
- that any drugs or compounds recommended were readily available and did not require a veterinary prescription.

A review of the animal welfare legislation in Australia showed no reason why owners are not

permitted to euthanize their fish if they are suffering, as long as it done in a humane manner.

For most states so long as the person carrying out the euthanasia did not charge a fee and non-prescription medication was used there was no contravention of any veterinary surgeon legislation. In those states where a vet must euthanize fish the legislation is under review.

Fish are an incredibly diverse group of organisms and for the purposes of this review were divided into four broad physiological groups:

- freshwater tropical;
- freshwater temperate;
- marine tropical; and,
- marine temperate.

There are also different sizes that may affect the manner of euthanasia:

- small (less than 5cm in length);
- medium (5 – 15cm); and,
- large (greater than 15cm).

An overdose of anaesthetic in the water is the method most commonly recommended by veterinary and scientific authorities for the euthanasia of fish in research environments or by registered veterinarians.

Clove oil appears to be an effective euthanasia agent for ornamental fish but the fact that there is not a 'registered' clove oil product available means that this report cannot make a firm recommendation supporting its use.

One recommendation is to encourage the development of an Australian Pesticides and Veterinary Medicines Authority (APVMA) registered (non-prescription) product available to fish owners.

A clove oil derivative (AQUI-S®) that is currently registered for fish is only available in volumes that are possibly excessive for use by owners of ornamental fish.

Physical methods (percussive stunning, decapitation, and pithing) have the advantage of not requiring a prescription or the purchase of chemical agents, but do require skill and experience to be performed safely and humanely. In the case of pet fish there is also likely to be a reluctance to use aesthetically displeasing methods on an animal to which there is an emotional attachment.

Hypothermal shock (rapid chilling) via the use of ice slurry can be effective, but research has only validated this method as being effective for some specific species of fish. Based on this research, it appears that hypothermal shock is only suitable for small-bodied tropical fish (either freshwater or marine) due to the sudden temperature difference. A detailed step-by step process for using rapid chilling / ice slurry for the euthanasia of small-bodied tropical ornamental fish was included in the report.

Several methods examined were considered unacceptable for euthanasia of ornamental fish:

- use of carbon dioxide;
- exsanguination (draining blood);
- freezing;
- flushing; and,
- maceration.

Until further research is conducted, the best and preferred method for the euthanasia of ornamental fish in the home and retail environment is the use of a registered clove oil derivative which can be added to the water in concentrations sufficient to result in an

anaesthetic overdose. Such a compound covers all possible fish types. The availability in small volumes though is an issue that needs to be considered.

A copy of the report can be found at http://piaa.net.au/wp-content/uploads/2015/10/Humane-Euthanasia-Techniques-for-Ornamental-Fish-AAWS-Document.pdf

Project 5. Holding Live Fish in Restaurants

This project aimed to develop information that would help promote best practice handling techniques for restaurants and retailers keeping live fish and shellfish for human consumption. This was to address one of the most common sources of public complaints (both real and perceived concerns) regarding the treatment of live fish and shellfish in these establishments across Australia.

Extensive consultation with suppliers of live seafood to the restaurant trade combined with a survey of over 200 restaurants and retail outlets keeping live fish and shellfish in Melbourne, Sydney, Brisbane and Perth resulted in the first draft of the guidelines.

This process indicated that to be most effective the guidelines needed to be limited to a small number of simple messages, presented in several languages other than English and with pictures.

The final version of the guidelines is therefore a brochure that contains simple, clear and concise messages, with pictures used throughout. It has been printed on waterproof paper and in three languages:

- English
  http://frdc.com.au/environment/welfare/Documents/Restaurant%20Animal%20Welfare%20brochure%20-English.pdf

- Mandarin
  http://frdc.com.au/environment/welfare/Documents/Restaurant%20Animal%20Welfare%20Brochure%20-%20Chinese.pdf

- Vietnamese
  http://frdc.com.au/environment/welfare/Documents/Restaurant%20Animal%20Welfare%20Brochure%20-%20Vietnamese.pdf

Initially, a number of State and Territory regulators agreed to coordinate the distribution of the brochures within their own respective jurisdictions.

A final copy of project report and accompanying brochures is available at Fisheries Research and Development Corporation
http://frdc.com.au/environment/welfare/Documents/FRDC%20Project%20No.%202012-506%20%28Final%20Report%29%20-%20Animal%20Welfare%20Guidelines%20for%20Restaurants%20-%20August%202015.pdf

Project 6. Use of ice slurry and refrigerated water in fish handling

This project was developed to improve the understanding of the extent to which ice slurry or refrigerated seawater (RSW) is used for the killing finfish.

The project reviewed the scientific understanding of this method of killing and identified if gaps are present with respect to welfare aspects and effects on product quality.

A survey was undertaken initially to assess the extent to which fisheries employ ice

slurry/RSW for dispatching/handling of finfish. This was followed by a detailed review of scientific and grey literature on use of ice slurry / RSW for the dispatch of finfish by commercial and recreational fishers (particularly focusing on priority species identified through the survey process). Factors that limit and/or optimise effectiveness of ice slurry/RSW use were documented, and knowledge gaps identified for future research.

The survey indicated that around 4.6% of commercial fishers and 32.5% of recreational fishers surveyed use ice slurry to kill finfish. Findings were that improved quality and ease of processing were the reasons fishers used this method.

The project concluded that there was insufficient information in reviewed literature that immersion in ice slurry is suitable as a primary killing method for most species in Australia. Percussion stunning or brain spiking prior to immersion is recommended. It was felt that the thermal shock of immersion in some smaller species may be sufficient to shorten the time to loss of brain function and death without avoidable stress. However, the literature review suggests that for temperate species of fish, and particularly large-bodied individuals (>500 grams), immersion in an ice slurry as a primary killing method is unlikely to rapidly render a fish unconscious until death without avoidable stress.

A YouTube video demonstration explaining the research and use of ice slurry can be found at https://www.youtube.com/watch?v=i4KmmV8CmjI

Copy of an explanatory brochure is available at:
http://frdc.com.au/environment/welfare/Documents/AAWS%20Ice%20Slurry%20Project%20-%20Ice%20Slurry%20Dispatch%20Brochure.pdf

Copy of the report is available at
http://frdc.com.au/environment/welfare/Documents/AAWWG%20-%20Ice%20Slurry%20Project%20%28Final%29%20Report%20-%20.pdf

Project 7. Road-test fish welfare guidelines in the Commercial sector

Workshops for the commercial capture fishing sector were held in 2007 providing a forum for discussion of what the commercial wild capture sector considered were the risks and opportunities related to fish welfare within the sector. Understandably the task of developing an individual welfare document for each fishery was considered to be difficult.
A number of options were considered by participants at the workshops for taking the issue of fish welfare forward in this sector. “Doing nothing” was an option, but was not supported. Participants believed there were considerable commercial and social licence benefits to be gained by assisting the industry to continually improve welfare practices, particularly concerning the minimisation of stress between *capture* and killing (*slaughter)* of fish, and during the *transport* and *holding* of live fish.

Reducing unnecessary suffering of fish during the capture, slaughter and holding of fish was considered a worthwhile aim, although it was acknowledged that it was not considered possible to eliminate ***all*** suffering when capturing wild fish. Animal welfare advocates attending the workshop agreed with this acknowledgment and ‘*minimising stress from capture to slaughter’* was the agreed objective.

One of the main factors affecting the welfare of fish in wild capture fisheries is stress and exhaustion associated with capture prior to slaughter. This is largely related to the harvesting technique used and the length of time that fish are allowed to struggle prior to being brought onboard, which in turn is often dictated by commercial considerations related to a particular fishery (Borderias and Sanchez-Alonso 2011). There are several killing methods commonly used by commercial fishermen to dispatch fish. One of the main factors affecting the welfare

of fish is the time taken for loss of consciousness to occur.

It was accepted by industry and animal welfare advocates that differences in techniques exist between handling large numbers of small fish and handling a smaller number of larger fish. It was considered less difficult to humanely slaughter a smaller number of larger fish, using methods such as spiking and stunning, than a large number of small fish.

The workshops noted that many animal welfare practices had already been adopted by the commercial fishing sector to improve overall product quality (a key commercial driver) and satisfied most of the general principles necessary to minimise the suffering of fish. The commercial capture fishing industry already has a considerable number of Codes of Conduct, Best Practice Manuals and Environmental Management Plans/Systems (EMP/EMS).

The development of legislated and enforceable minimum regulatory welfare standards through the AAWS process was not supported by industry or the AAWWG. However the *'Overarching Principles for Aquatic Animal Welfare'* were seen as a way to assist in benchmarking the myriad manuals and codes in place and reduce unnecessary suffering of fish during their capture, slaughter and holding. The potential improvements in fish quality and fish welfare provided a win-win approach for both fishers and fish.

In this project operating capture method guidelines were developed incorporating the 'Overarching Principles' and the existing commercial fishing welfare guidelines for six different capture methods to provide documents that are practical and applicable at the operator level as well as meeting welfare standards. The capture methods were haul seining, set mesh netting, hand-lining and trawling. The project also reviewed a range of research findings into killing methods and handling/processing techniques.

This project was not about changing fundamental fishing practices or techniques but working closely with experienced commercial fishers to document how fish welfare issues can be addressed within the constraints of a fishing operation and ground-truth the overarching principles developed through the AAWWG.

The specific vessel operator fish welfare guidelines that have been developed through this project demonstrate a successful mix between fish welfare and economics. They are deliberately designed to be living documents so that as the understanding of fish welfare grows and methods used to catch fish improves, it is likely that further adjustments can be made.

Commercial reality is also important to consider. When any proposed change to a fishing method is proposed to ensure improved fish quality and welfare this usually results in an increase in the cost of capture (eg. the need to purchase additional ice for each trip) or indirectly (eg. by increasing the physical handling time of each individual fish, thereby increasing the total fishing time to catch the same number of fish). Members of the general public seeking best animal welfare outcomes must remember this when assessing the price for the local caught fish they eat.

This project has shown that addressing issues of fish welfare at the boat (operator) level through development of specific practical guidelines ***is possible.***

Copy of full project available at:
http://frdc.com.au/environment/welfare/Documents/FRDC%20Project%202012.507%20%28Final%20Report%29%20-%20Roadtest%20Guidelines%20in%20Commercial%20Sector%20-%20July%202015.pdf

Project 8. Road-test fish welfare guidelines in the Recreational sector
This project was conducted in conjunction with the Victorian recreational fishing peak body (VRFish). It was the first project in Australia to evaluate high profile fishing competitions and charter boat operations purely from an animal welfare perspective.
The recreational sector accepts that projects such as this are important for the recreational fishing community to positively strengthen its social license through improvements in fish welfare.
This project applied the *Aquatic Animal Welfare Overarching Principles* at two major fishing competitions covering more than 4000 recreational fishers. Fish at these competitions are immediately killed, or kept alive between capture and measuring.
The project developed a model process that can be applied to any fishing competition in Australia.

Competitors were surveyed at the first competition in relation to killing methods and live holding techniques with 49% using ice water slurry and 34% killing the fish by a blow to the head (percussive stunning) or brain spike. Educational material and a communication strategy were developed and delivered through a number of channels, including presentations at the competition and subsequent mail outs, web and social media.

Copies of the educational material is at:

1. http://frdc.com.au/environment/welfare/Documents/Recreational%20Fishing%20-%20Humane%20Killing%20Brochure.pdf and,

2. http://panaquatic.com/projects/fishing-for-snapper/

Competitors were surveyed at the 2nd competition later in the year and numbers had improved to 43% now killing the fish by a blow to the head (percussive stunning) or brain spike. Interest levels in welfare aspects of handling techniques were also higher especially in regard to live holding wells and the detrimental impacts of air exposure to quality.

This project has identified that there are many within the recreational fishing community who want to understand more about fish and about what they can do to respect the fish they catch and minimise the stress they may impose on them. There are also many who want to know how to maximise the eating qualities of the fish they catch by better handling.

A number of project materials were fostered by this project:

1. An educational brochure specifically addressing methods of killing snapper and how to release snapper to maximise survival (see links above);
2. Presentations have been developed and presented at the Melbourne Boat Show;
3. Questionnaire for surveying competitors at recreational fishing competitions; and,
4. A number of proto-type 'short term holding bags' were developed and trialled at the Mulwala Cod Classic.

Material developed has assisted VRFish and the Victorian Department of Environment and Primary Industries in their project "*Help released snapper to survive";*
This project has opened up the discussion on fish welfare in the recreational fishing community. Fish welfare is considered a key issue to be built into the VRFish communication plan as a key focus of this plan is the recreational fishing community's social license to operate.

VRFish promoted the need for recreational anglers to be proactive on the issue of fish welfare at the 7th World Recreational Fishing Conference in Brazil.

The work of this project continues via a number of other actions including:

- The VRFish magazine "Fishing Lines" being devoted to the issue of fish welfare and

what anglers can do to be responsible;
- Continued Facebook and Twitter posts on the VRFish/Department of Environment and Primary Industries Snapper Survival Project;
- Communications in the Club Marine magazine, Modern Fishing and Victorian Fishing Monthly; and
- VRFish radio interviews regarding snapper survival.

Copy of the final research report is available at
http://frdc.com.au/environment/welfare/Documents/FRDC%20Project%202012.508%20%28Final%20Report%29%20-%20Roadtest%20Guidelines%20in%20Recreational%20Sector%20-%20June%202015%20.pdf

Project 9. AAWWG - Administration and Communication Delivery
In late 2012 the AAWWG was ready to release the knowledge and guidance materials they had developed on aquatic animal welfare for wider circulation within the various sector groups using established trusted sector networks and to the broader community.

The funding was obtained to engage a part time person over three years to develop of a communication plan and provide co-ordination with peak bodies across the extremely diverse sectors of aquatic animals.

The funding was also to assist with the administration and co-ordination of the AAWWG and the many projects under their responsibility.

The demise of the AAWS in 2013 (a decision of the incoming federal government) was unexpected and immediate. The result was removal of the departmental support personnel for the various sectors working groups (including the AAWWG.) However projects approved for funding prior to the closure of AWWS were able to continue until completion.

The AAWWG members met in 2013 and agreed to maintain the working group on a *'voluntary basis'* to complete the approved projects currently underway and to make whatever impact was possible. Variations were made to the objectives of the administration and communication for the group to shift the emphasis to greater co-ordination of the AAWWG and research projects given the immediate demise of AAWS funding and supporting Department staff.

Since that time the AAWWG has coordinated presentations at various conferences, worked with media enquiries, assisted various industry sectors on request, coordinated AAWWG responses to RSPCA draft documentation and communicated outcomes from projects to the various sectors and government agencies in the aquatic arena.

Funding for this position expired in March 2016.

Prospective Projects
The AAWWG identified a number of additional projects but unfortunately the demise of AAWS in 2013 immediately removed all available funding to the AAWWG and thus the following projects have not eventuated:

- Guidelines for animal welfare in ornamental fish sector – retail;
- Humane dispatch of aquatic pests;
- Improve live holding facilities on recreational fishing vessels; and,
- Harmonisation of fish welfare legislation across Australia.

Conclusions

The maturity of the AAWWG to set aside debate on *'do fish feel pain'* and concentrate on practical outcomes to '*minimise stress from capture to slaughter'* allowed this sector and animal welfare advocates to proceed relatively smoothly along the path of improving fish welfare in the various sectors.

Fishing stakeholders have indicated they are prepared to consider adjustments to their practices, where they are involved in the adjustment process and provided there is the opportunity to demonstrate the practical implications to their business as well as the animal welfare outcomes of any suggested adjustments

It is clear that there is a very close relationship between minimising stress in fish and the quality outcomes of the final product. The commercial fishing and aquaculture industries have applied this approach for many, many years and their existing practices, although not labelled specifically as for *'animal welfare'*, results in relatively high fish welfare results.

The recreational fishing sector is rapidly improving its understanding of the relationship between fish welfare and quality of fish to eat.

The ornamental sector has initiated many welfare improvements but humane dispatch of fish remains a problem due to legislation restrictions on some of the most effective dispatch methods (eg use of clove oil as an anaesthetic).

The process of the AAWWG since 2005 has demonstrated that operational processes (eg capture of large volume of small fish) require slaughter methods that can minimise stress across the whole catch as quickly as possible (eg use of ice slurry) rather than on an animal by animal basis which is more effectively achieved with smaller volumes of larger fish (eg stunning or brain spiking).

Implications

Following the untimely demise of AAWS in 2013 the members of the Aquatic Animal Welfare Working Group (AAWWG) agreed to continue on a *'voluntary basis'*, especially as several projects were underway or had funding approved and were about to commence.

The last of these projects was only completed at the end 2016.

The four aquatic sectors now have a range of findings that, when combined, produce a valuable series of practical outcomes and materials for circulation and use within the various aquatic sectors. There are some sectors with identified gaps but due to the failure to be able to fund all of these projects these gaps remain (see above).

The take-up of these outcomes and materials now lies with the aquatic sectors to which they apply – commercial capture fishing, aquaculture, recreational fishing, ornamental fish and restaurants holding live fish.

Unfortunately without adequate long-term funding sources the AAWWG will be limited in its future efforts. However, the working group will continue to encourage and assist the various aquatic sectors to adopt the welfare improvements identified and seek funding opportunities to continue its valuable work.

Extension and Adoption

This final project report contains links to the full report of every project (and associated materials) commissioned by the AAWWG.

This final project report has been forwarded to the national peak industry body for each aquatic sector, the state peak sector group (where in place), Animal Australia, RSPCA, the Australian Veterinarians' Association, Oceanwatch, the Australian Fisheries Managers Forum and the Department of Agriculture and Water Resources.

A request has been included that each group use their communication networks to circulate the report for broader sector stakeholder access and consideration.

Project coverage

Not applicable

Project materials developed

Materials developed for each individual project are highlighted and links provided in the main body of the report above.

A draft communication plan was developed as part of one of the projects but unfortunately the demise of the AAWS in 2013 resulted in a funding withdrawal to support implementation of the plan. (Attachment 2)

Appendices

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Attachment 1

Aquatic Animal Welfare Working Group Membership (all members since 2005)

Chairman	Brett McCallum (2008-17)
	Simon Bennison (2005-08)
Commercial fishing sector	John Harrison
	Claire Webber
	Brian Jeffriess
	Neil Stump
Aquaculture sector	Christine Huynh
	Pheroze Jungalwalla
Recreational sector	Christopher Collins
	Leyland Campbell
Ornamental/Aquarium sector	Josiah Pitt
	Shane Willis
Government	Gaye Looby
	Rod Andrewartha
Veterinary Science	Dr Paul Hardy-Smith
Oceanwatch	Lowri Pryce
	Anissa Lawrence
Animals Australia	Glenys Oogjes
	Carole De Fraga
RSPCA	Dr Onn Ben-David

Attachment 2.

Aquatic Animal Welfare

Communications Plan

Prepared for the AAWS Aquatic Animal Welfare Working Group

Date: July 2014

Contents

Executive Summary

The Australian Government initiated the development of animal welfare guidelines to provide a nationally consistent basis for animal welfare regulation. The process took place under the Australian Animal Welfare Strategy (AAWS) commencing in 2005.

Successful welfare outcomes rely, in part, on target audiences being aware of information that exists and able to understand what is required of them in relatively simple, straight-forward terms.

This communication plan has been developed as an effective platform to achieve the education of stakeholders of the overarching principles for animal welfare for finfish and guidelines to minimise stress from capture to slaughter within the various finfish sectors (at the primary and secondary levels) and the broader community audiences.

The following principles will be applied to meet the communication objectives:

- Maximise use of existing industry and stakeholder communication channels.
- Prioritise resources towards higher risk, hard to reach audiences.
- Focus communications on proven practices and key changes in order to maximise welfare outcomes .
- All stakeholder groups (regulators, industry and welfare groups) work collaboratively with respect to communication about aquatic animal welfare.
- Ensure that the timing and implementation of communication activities is coordinated to achieve maximum momentum.
- Messages should be as consistent as possible.

Key messages explain the overarching principles as well as the AAWS, the sector guidelines developed and the opportunities available for obtaining information.

The communication tactics (and their major elements) selected for this plan include:

- Materials - fact sheets, brochures, booklets, posters
- Video – You Tube, DVD
- Media releases and articles for industry/stakeholder communication channels
- Media program
- Digital program - websites
- Industry and regulator specific activities to drive awareness and adoption (eg meetings, tournaments, field days)

1. Objectives

The policy objective that underpins this communication plan is to establish national aquatic animal welfare awareness that reflects contemporary scientific knowledge, competent animal husbandry and mainstream community expectations, and that these elements are adopted in a practical, consistent, cost-effective manner.
The communication objectives are:

- To maximise awareness among the various aquatic sectors (at the primary and secondary levels) and the broader community of the existence of aquatic animal welfare guidelines and practices.
- To promote the guidelines as applicable to everyone who has a responsibility for aquatic animals.
- To provide opportunities for the wider public to understand the need for, and broad intent of the policy and guidelines for improving aquatic animal welfare in Australia.

2. Barriers and Drivers

The communication plan identifies the barriers and drivers to achieving the communication objectives. It also identifies the key issues and considerations to be taken into account in the development of this plan and the broad strategic principles required to meet the communication objectives.

Barriers

- Belief among certain audiences that they are already in compliance with welfare requirements and therefore do not need to give attention to the principles and guidelines.
- Belief that guideline implementation will require unnecessary changes to current practices and more ‘red-tape’.
- Difficulties in finding and understanding the principles and guidelines; due to length and complexity of guidelines and uncommon language.
- Belief among the wider community that industry sectors are not applying welfare principles and guidelines.

Drivers

- Awareness of animal welfare principles and application of appropriate guidelines is usually good for business.
- Application of animal welfare principles through the guidelines will help industry meet customer and community expectations of responsible animal care.
- Awareness of legislative requirements is important in order to avoid prosecution and penalties.

3. Key considerations

- One of the most significant challenges for raising awareness of animal welfare is communicating to ‘hard-to-reach’ groups.

- Depending on the aquatic species or industry, these groups may include:
  - people for whom caring for animals is not their primary enterprise (eg recreational fishers)
  - culturally and linguistically diverse audiences (eg restaurants)
  - supply chain participants that are not directly affiliated with industry organisations and may not receive regular member communications (eg pet shops)

- The communication plan should give due consideration to areas/audiences where the risk of non-compliance is likely to be the greatest.

- All key stakeholders (Government, industry and welfare groups) share responsibility for communication.

- Timing and coordination of communication is important - the communication will set correct expectations among audiences in relation to time lag between guideline development and adoption or implementation.

- There will be differences in implementation, wording and regulatory posture between sectors and across regions.

- Audiences need to understand that the guidelines are not regulatory but refer to ‘best practice’.

- The communication environment is fragmented and crowded, and the target audiences are increasingly time and attention poor.

4. Approach to Achieve Objectives

The following broad strategic approach is proposed to best achieve the communications objectives after consideration of the drivers, barriers and key considerations identified above.

- Maximise use of existing industry and stakeholder communication channels (industry, government and media) to reach as many target audiences as possible.

- Prioritise resources towards ‘hard-to-reach’ audiences and those of higher risk (in terms of compliance).

- Focus communications on the key changes to current practice in order to maximise welfare outcomes (i.e. what are the practices likely to have the greatest impact on welfare, and what/where are the most significant gaps in knowledge/adoption).

- All stakeholder groups need to work collaboratively with respect to communication of the principles and guidelines. To this end, it is important to recognise the different roles and audiences of these groups in terms of communication and harnessing the strengths of each group to help deliver information.

5. Target Audiences

This section identifies the audiences that the communication strategy is aiming to reach. Audiences are categorised into Primary, Secondary, Influencers and Tertiary as follows:

- The people/groups that you are trying to influence directly (*Primary*)
- Other people/groups that also will be affected (*Secondary*);
- The people/groups who can potentially influence these audiences (*Influencers*)
- The people/groups who are not the main target but may want to know what is happening (*Indirect influencers*)

1. *Primary audiences* – people that are responsible for the care, handling and/or welfare of aquatic animals
    - Finfish harvesters or producers (commercial)
    - Finfish harvesters (recreational)
    - Processors, wholesalers, retailers and restaurants handling live finfish
    - Finfish owners (home fish aquariums)

2. *Secondary audiences* – people that come into contact with animals during their work
    - People involved in the transport and/or sale of animals
    - People involved in providing advice, products and or services in relation to animals

3. *Influencers* – people or groups who can potentially influence primary and secondary audiences
    - Industry organisations
    - Government agencies, regulators, Ministers and MPs
    - Commercial partners (suppliers/customers)
    - Welfare groups
    - Trade media

4. *Indirect influencers* – people who are not the main target but may want to know what is happening
    - Australian community
    - Relevant interest groups

6. Key Messages

- The principles and guidelines cover the full range of aquatic animal sectors:
    - commercial fishing
    - recreational fishing
    - aquaculture
    - ornamental – pet shops, home aquaria
    - restaurants

- Principles and guidelines create a clear and consistent approach to finfish welfare based on recommended industry practices, scientific knowledge and community expectations.

- This is a joint effort by government, industry and welfare groups to develop a set of consistent guidelines for animal welfare. The guidelines were developed to safeguard animal welfare and designed to be practical for industry and government to implement.

- Principles and guidelines supported by government, industry and animal welfare groups.
- The guidelines identify recommended practices that will help achieve animal welfare outcomes. These are voluntary guidelines and failure to comply with the guidelines is not a legal offence.
- There is growing public interest in Australia and around the world about the way animals are harvested and farmed..

- Many aquatic sectors and industries have made significant progress in developing quality assurance (QA) programs that exceed the animal welfare guidelines.

- The guidelines will give consumers greater confidence that finfish are treated humanely.

- Looking after animals properly makes good business sense and many industries and organisations are already exceeding the requirements of the guidelines.

- The guidelines will help authorities to assess if people are doing the right thing.

- Given that some sectors operate on a national basis, it makes sense that animal welfare principles and guidelines are consistent across the country.

- The principles and guidelines demonstrate to customers and consumers both here and overseas the expected level of care for finfish in Australia.

- While most Australian producers already exceed the requirements of the guidelines, some may need to adjust current practices to further improve their welfare of finfish.

- Download a complete copy of the guidelines, as well as accompanying fact sheets, at www.[tbc]

7. Major communication pathways

- Industry communications (member newsletters, publications, field days, events, online)
- National / regional / trade / lifestyle media
- Direct communication and representation
- Highlight cases of successful adoption of and compliance with guidelines, as well as instances of non-compliance and legal action.

Specific activities
Produce articles, stories and/or updates in existing industry communication channels. These should leverage producer champions and/or case studies as far as practicable.
Place links to communications materials prepared under this strategy on industry websites.
Materials/activities should include:

- Production and dissemination of guidelines and information materials in a format that is practical and useful for end-users
- Place links to communications materials prepared under this plan on regulators' websites
- Incorporation of guidelines and information into current industry guides, QA programs and advice for end-users
- Incorporation of guidelines and information into current industry/community extension programs and activities
- Use of producer champions and/or case studies as far as practicable

8. Evaluation

Evaluation of the effectiveness of the plan as a whole against the specific communications objectives can be undertaken through a number of methods:

- Feedback collected through interviews with stakeholders and producer/industry bodies 12 months after implementation
- Feedback collected through questions included in regular fisher/producers/customer surveys
- Projects completed on time; 'road-test' extension methods with small cross-section of producers; end-user feedback
- Interest, engagement and coverage by cross section of national and regional media
- Internet traffic

9. Risk management

Risk	**Management**
This plan is not implemented effectively and as a result awareness of the aquatic animal is below expectations	Implementation of the plan and monitoring of its effectiveness is managed by a communications coordinator, whose activities are overseen by the Aquatic Animal Welfare Working Group
The implementation of the plan inadvertently triggers public debate about aquatic animal welfare or other issues unrelated to the matters covered in the guidelines	The Working Group develops and agrees an 'issues management plan' (ie. what key messages will be delivered by whom; what communication actions must be taken in the event of an issue arising) that addresses issues raised
Public criticism of guidelines undermines faith in the process and the provisions of the guidelines themselves	The Working Group develops and agrees an 'issues management plan' (ie. what key messages will be delivered by whom; what communication actions must be taken in the event of an issue arising) that addresses such issues.

Delay in release of guidelines undermines faith in the process and results in lost momentum and engagement	Participating organisations must be careful not to make any public statements about upcoming release without clearance through the Working Group