FINAL REPORT (DEVELOPMENT AWARD)

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Background

The Future Leaders program has invested in the development of young people in the recreational fishing sector since 2010. Young leaders from Western Australia, Northern Territory, Queensland, New South Wales, Victoria and South Australia have been given the opportunity to attend workshops aimed at developing networks, leadership qualities and knowledge of fisheries management. As a result of the success of the state Future Leaders programs, an opportunity to attend the World Recreational Fishing Conference 2014 in Campinas, Brazil was offered to graduates of these courses, as well as other recognised current and future leaders in the recreational fishing sector.

The Future Leaders participants selected to attend the conference have a variety of skills, knowledge and experiences. This includes individuals working for recreational sector peak bodies, fisheries management, small business owners & employees, public policy employees and sponsored recreational fishers. This diversity contributed to the group to developing a broad understanding of the issues faced in the area of recreational fisheries management.

The wide and varied background of attendees promoted healthy, robust discussions throughout the conference, which allowed for the sharing of knowledge and innovative ideas to tackle some of the obstacles currently faced by recreational fishing in Australia.

Objectives

- To establish and further develop strong effective national and international networks;
- To build domestic capacity and increase knowledge within the recreational fishing sector
- To meet with recognised leaders in various management and research fields, who have knowledge on subjects the future leaders identify as high priorities for the future of the recreational sector in Australia
- To further progress and enhance personal development including leadership skills, public speaking, managing group dynamics and event planning.

- Present findings and experiences from the conference to the broader public using various media channels, publications and presentations.

Activities Undertaken

The 7th World Recreational Fishing Conference (WRFC7) was held in Campinas, Sao Paulo State, Brazil from the 1st to 4th of September 2014. The conference was aimed at increasing communication and knowledge of innovative management and research within the recreational fishing sector, while fostering dialogue among various parties, directly and indirectly connected to the world of recreational fishing. The overarching theme was “change, transformation and adaptation in recreational fisheries”.

The Key Issues of the conference were:

i. Social and Environmental changes and the impacts on recreational fisheries

ii. Transformation and maximization of social and economic benefits generated by recreational fishery activities

iii. Recreational fishers attitudes to cope with the impact of change

These key issues were then further refined into sub-themes/topics, this content was delivered via lectures, oral communications, round tables, symposia and poster sessions (**Appendix 1**: Conference Outline). Speakers were selected from across the world and delivered material on a wide range of topics. Keynote speakers included world leading fisheries researcher Prof Robert Arlinghaus and international authority on pelagic fish Dr Julian Pepperel.

In an effort to absorb as much of the information presented at the conference as possible, the future leader group endeavoured to have representatives at each of the lectures/ discussions within the conference.

To further develop relationships at the conference and facilitate further discussion on key issues, as well as to obtain additional information of potential benefit to the recreational sector in Australia, the group met separately with the following leaders in their field:

- Rob Southwick– Southwick Associates INC, USA
- Kevin Pope – Nebraska Cooperative Fish & Wildlife Research
- Steven Cooke – Carleton University, Ottawa, Canada
- Owen Bird- Executive Director, Sport Fishing Institute of British Columbia, Canada
- Kieran Hyder – Centre for Environment, Fisheries & Aquaculture Science UK
- Robert Arlinghaus – Leibniz-Institute of Freshwater Ecology & Inland Fisheries

The Future Leaders group feel confident of being able to liaise further with these experts contacts, in order to to assist in issues relating to the Australian recreational fishing sector.

Results and Discussion

The outcomes and key messages within each sub-theme/topic from the conference, as well as further discussion of these issues, is summarised. It is envisaged that that this information can be utilised by others within the Australian recreational fishing sector.

a) Assessment of the Economic Importance of Recreational Fisheries

Recreational fishing is a powerful economic driver and has the potential to be more sustainable than other types of fishing when managed correctly. It is important to utilise economics and economic data in the management of fisheries in order to allocate scarce resources between competing uses and user groups.

The most important aspect of being able to generate an assessment of the economic importance of any fishery, whether on a national, local or species specific scale, is a solid data set. Data collection should include:

- Participation rates
- Catch per unit effort
- Expenditure
- Trip behaviour

From this a monetary value can be applied to the resource(s) by analysing the data to ascertain:

- Direct impacts
- Indirect impacts
- Induced impacts
- Employment figures
- Taxes generated

This monetary value is important for fisheries managers to be able to maximise the value of the resource. On a local level, it is of great importance to be able to demonstrate a monetary value of a species or fishery to decision makers. Recognition of this value, is important if anglers want be involved as stakeholders in the management of a fishery.

It is important to note that while it is possible to acquire the necessary data to complete an in-depth survey to quantify the economic value of a recreational fishery, through ‘boots on the ground’ work (at great expense), one theme that shone through in the following discussion was that, every country/jurisdiction that had good figures on their fisheries, also had a licensing system in place. These licensing systems varied greatly in their scope, application and availability, no two were the same; however the act of having the details of anglers who

are accessing the resources that need to be valued, was a significant advantage in rolling out the required economic surveys.
Another method that was also discussed, was the use of new technology via smartphone applications to log angler activity in great detail. Some applications already exist that can log movement via GPS, catch data, species identification and weather conditions. These apps may have some use for managers, once data sets become significant. Although some biases must be acknowledged, this data can provide details of changes in catch per unit effort or movement of species due to seasonal/climate change etc.

In conclusion, the analysis of the economic importance of fisheries in Australia and internationally is of great importance if we are to manage and utilise them effectively, not just for anglers but for the wider community and economy. Recreational fishing generates capital for communities and governments, via revenue, wages and taxes and should be managed in a way that maximises these values, all the while maintaining the sustainability of the resource it relies upon.

b) Catch and Release Practices

Fish are caught and released by recreational fishers for a number of reasons. Conservation of fish stocks and the high value recreational fishers place on individual fish, is a major angler driven reason. Other reasons include the mandatory release of certain species, captured fish not fitting within size or bag limit requirements, or fish other than the target species being caught.

On the surface, catch and release seems relatively straightforward. It is easy enough in its basic form; a fish is caught, unhooked and carefully released back into its environment. The reality though, is there are numerous variables and in some instances there is more harm than good done by well-intentioned anglers. This aspect of conservation was a major theme at the WRFC7 and many presentations were given on this. Some of the presenters included: Steven Cooke from Canada, Jon Olaussen from Norway and Jacob Brownscombe from USA.

Educating anglers to release fish in the first instance can be an involved task. Sport fishers and expert anglers, understand the importance of properly releasing fish, however, the wider angling population may be less aware of the specifics and the need for, best practice release procedures. There have been many approaches to expanding the application of best practice throughout Australia and the world. The success of widespread application of appropriate fish handling techniques can depend on various factors, including socioeconomic conditions and target species. It is an educational process and that goes hand in hand with lessons learnt from experience, thus data must be gathered and updated to enhance successful learning and bring about change when needed.

Steven Cooke presented research on Mahseer in India and from his article titled "How we should revive exhausted fish”, it is apparent that different species of fish handle catch and

release in a variety of ways. Some are robust, whilst others are very susceptible to injury from handling. It is suggested that there is a common link in factors such as revival times afforded by the angler. Research was presented showing that the longer a fish is given to gain its bearings prior to release, the greater its chances of evading immediate predation as well as improvements in general health.

Research presented by Jacob Brownscombe revealed that in a recent study, released bonefish had a predation risk of 39% within 30 minutes. While this is location specific, it highlights the dangers fish face in the period immediately following release. Fish which were stressed during capture, to the point of losing equilibrium, were six times more likely to die from predation; even with careful release. Stressed fish were observed to swim erratically and to occupy dangerous/exposed locations after release. This raises questions about the cognitive contribution to predation susceptibility, resulting from capture, stress and air exposure.

It was found that allowing fish to rest (in a safe mesh box) prior to release reduced the chance of predation and increased the chance of survival. Suggestions were made relating to the assessment of fish to be released and the appropriate release procedures. This assessment was called Reflex Impairment Mortality Predictors (RAMP) and involves anglers observing the following;

- Response to tail grab
- Orientation/equilibrium
- Body flex (when held sideways)
- Breathing effort
- Ocular response to stimuli

Many of the concepts presented in this area seem to cross over from one species to another, so a baseline data package could be devised and distributed. Because different fish and locations also have unique features, it is still important that each fishery has it's own set of handling guidelines, and that these are kept current and are easily accessed by the public. Group discussion centred around recent developments in the golden snapper, pink snapper and samson fish fisheries in Australia and the relevant jurisdictional approaches to deal with barotrauma as a result of fish being caught in deep waters.

Catch and release can be an effective tool for stock management and conservation. If practiced effectively, with risks to mortality mitigated against, it offers the opportunity for increased value and sustainability in recreational fisheries. There are however, significant gaps in knowledge about specific effects of angling and species specific biology/behaviour. The need for further research in this area was highlighted by presenters at the conference.

c) Recreational Fishing, Conservation and Marine Protected Areas (MPAs)

Moves to conserve fish stocks and protect marine, freshwater and estuarine habitats have implications for all fishing sectors.

The presented opportunities, challenges and issues arising from the recreational fishing - conservation dynamic, include;

- · The effects of the expanding roll-out of MPAs
- · Role of recreational fishers as stakeholders in conservation projects
- · Angler adaptability
- · Citizen science
- · Compliance

In the absence of funding for targeted in-depth research, the precautionary principle has regularly been applied in selecting areas for protection and defining permitted activities. In his keynote speech Dr. Julian Pepperell explored the idea that recreational fishing is displaced by MPAs, however it may, in some areas, not impact upon the stated conservation values.

In a special meeting with the Future Leaders group, Dr Steven Cook discussed his work on MPAs. The key themes included;

- · Need for“true wilderness areas”to be reserved
- · MPAs can contribute to controlling exploitation, increasing biodiversity, maintaining genetic diversity and potentially export biomass to adjacent areas
- · Recreational fishers inclusion in MPAs can play an important role in monitoring & observing, data collection, compliance enforcement and community buy-in, while still providing conservation outcomes.
- · At this early stage, MPAs are“large scale”ecological experiments.

Other presentations of direct relevance to this topic included Juan Martin Cuevas on the success of anglers contributing to shark conservation in an Argentinian MPA . Solange Arrolho, presented a study where anglers, through tag, release and recapture, contributed data relating to fish movements in and out of an area of ecological significance. Fabio Motta delivered information detailing the economic significance of recreational fishing in a Brazilian MPA. Marie Fujitani presented insightful research into the non-linear relationship between the severity of fines and compliance rates in no-fishing areas.

Around the world, the spatial scale and permitted activities within protected areas has been wide-ranging. This has lead to significant variations in the localised impacts on recreational fishing and is, therefore, of interest for comparative purposes. There did not not appear to be a singular, leading example of best practice, however it appears common for recreational fishing to be permitted in many conservation areas, particularly in Europe, North and South America.

While in some jurisdictions, MPAs are used to control extraction, recreational fishing for many species, can be a low risk to biodiversity when properly managed and monitored. According to Dr Pepperell, Australia currently has 30% of the worlds MPA's by area. Australia also has many well managed fisheries, that are recognised internationally. Marine Protected Areas have an important role in marine ecosystem management, however should not be viewed as a replacement for sound, sustainable fisheries management strategies.

Recreational anglers can play a valuable role in conservation management through data collection, monitoring, compliance and community support. Angler inclusion can also provide local economic benefits. This highlights the opportunities and foreseeable advantages of integrating recreational fishing activity in MPAs. Furthermore, if we characterise MPAs as large scale ecological experiments, we can measure and compare conservation outcomes in areas where recreational anglers are active stakeholders and where no fishing is permitted.

The previously mentioned examples from Arrolho and Cuevas have demonstrated how anglers can play an important role as custodians and active stakeholders in conservation initiatives. Presentations from Fisheries Western Australia and a meeting with the European fisheries manager, Keiren Hyder, highlighted the possibility of citizen science contributing to valuable catch and distribution data. Advancements in technology and the development of smartphone apps have opened up new possibilities and cost effective avenues to deliver this.

There are significant opportunities for fisheries managers and conservation authorities to include recreational anglers in conservation projects. Anglers are skilled and knowledgeable in fish behaviour and identification, and have demonstrated the ability to adapt fishing practices in order to achieve conservation aims. Angler inclusion in MPAs can lead to better economic outcomes and foster community support through the custodianship of conservation initiatives.

d) Innovative Management and Governance Methods

The scope of this topic ranged greatly from the implementation of basic management strategies and gaining recognition of recreational fishing sector in developing countries, to further refining and implementing particular services and programs within the recreational sector.

A major focus when discussing innovative management was how co-management and angler driven programs can be developed and implemented. This included examples within Australia; of the murray cod fishery, a multi-jurisdictional fishery, and west coast demersal scalefish fishery in Western Australia. A certified tidal angling guide program, that has been developed and implemented within British Columbia Canada, has government, industry and stakeholder groups working to protect fish stocks, enhance management knowledge and outcomes and ensure predictable and sustainable recreational fishing opportunities. The

innovative program developed a curriculum for training tidal angling guides in nature interpretation, catch monitoring, fisheries biology, vessel and marine safety.

In terms of a useful and simple way of communicating adaptive management of the recreational fishing sector, the development of the UN Food and Agriculture Organisation (FAO) Technical Guidelines for Responsible Fisheries: Recreational Fisheries is valuable resource. Discussions at the conference focused around the strategies within the guide to promote sustainable and socially responsible management in terms of policy, fisheries management and behavioural recommendations. Policy makers, fisheries managers, researchers and recreational fishers can use this guide.

Throughout the conference there was also discussion on providing research strategies to achieve innovative management objectives by the collection of the accurate and reflective research data from the recreational fishing sector. There were examples of innovative programs to estimate catch and effort within the recreational sector being implemented in Canada, the United States and Australia. What is interesting to note is that the programs were generally implemented once a recreational licence had been in place, giving a framework for sampling.

Another management mechanism was zoning which can be used to increase angler satisfaction as well as management of particular activities. An example of zoning, recreational angling and boating in the North Umpqua River (Oregon, USA) was provided with the zoning resulting in high levels of satisfaction by both groups as well as low levels of recreational conflict and crowding. Additionally, a wilderness management regime that was introduced to control angler pressure and preserve the low encounter rate had been trialled in Otago River in New Zealand. This allows anglers to “book” a part of the river online and is a particularly restrictive management approach.

The social norms approach was discussed as an alternative way to increase compliance in the recreational sector, as opposed to increases in levels of enforcement and penalties. Research in a shore-based coastal town in South Africa showed that generally, anglers significantly over-estimated the non-compliance of other anglers and that anglers who estimated low compliance in others, were less likely to comply themselves. An innovative approach to increase compliance was then suggested, with the use of a targeted management campaign, like those that have been successful in achieving the required behaviour (drinking behaviour, smoking, seat belt use) on increasing awareness within the recreational sector of the compliance.

Technological innovation can improve communication and development of innovative management with the recreational sector. In the United States, the National Oceanic and Atmospheric Administration (NOAA) has developed the Recreational Fisheries Engagement Initiative that will allow for the development of the first ever national policy, that will guide the agencies decisions in the future, for saltwater recreational fisheries. In development of this

policy, the NOAA held a conference. Innovative technologies were used to allow participants to define the themes of the conference, with emailing of a pre-summit survey and within the conference instant messaging was used to set the prioritise of the future meeting and affect the national policy.

e) Fisheries Management Sustainability

The two facets of management sustainability that were notable areas of focus at the conference were;

- Environmental Sustainability in relation to fish harvest, both recreationally and commercially, and;
- Financial sustainability in relation to declining participation in a user pays model.

These areas were highlighted by many of the presenters including, economists, fisheries managers and scientists.

David Lester from Ontario, Canada's Ministry of Natural Resources stated in his keynote presentation, that the management goal of his organisation is "to keep recreational fishing harvest less than natural mortality." In this instance, he was referring to achieving an environment where all fisheries were managed in a way that the recreational take would not exceed the level of mortality occurring naturally.

To achieve this Lester's team revised the provinces' fishing regulations, taking into account the enormous area to be managed, financial constraints and participation rates in different areas. Because license sales fund fisheries management practices, there is 'user pays' system in place. This means there is a finite budget and funds are apportioned based upon the usage of a fishery. The goal of this process was to achieve environmentally and financially sustainable fisheries.

Andrew Wilson of the Freshwater Fisheries Society British Columbia (FFSBC), explained that BC had experienced a 21% decline in the numbers of recreational anglers over a 10 year period. In response to declining licence sales, FFSBC undertook a number of programs to boost participation and engage children in fishing activities. FFSBC are responsible for the stocking of over 1000 lakes and operate five salmonid hatcheries in the province.

Bailey and Clarke, also from British Columbia (BC), described the difficulties in managing a user pays system in a declining participation environment. Significantly, they noted that the highest percentage of license holders are due to enter the 65+ years age cohort, making them exempt from paying for a fishing license.The key issue facing BC freshwater fisheries over the coming years will be maintaining financial sustainability. The organisation had several proposed models on how to combat this issue and maintain thriving inland fisheries.

f) Social License to Operate

Put simply, Social Licence to Operate (SLO) is the implicit and explicit permission from communities and stakeholders for an activity to take place. The granting of this permission typically relies upon the ability of the activity to satisfy social values. Anglers worldwide are subject to many and varied social values. These are not static and are constantly evolving. In his keynote speech, Dr Robert Arlinghaus delivered the findings of his research in this area. His study suggested that as a society evolves to becomes more prosperous, its members often place a higher importance on the environment as a system, as well as the individual the creatures within it. Further to this, community attitudes to recreational fishing is largely based upon these broader values, rather than specific knowledge, for example, about fishery sustainability or whether fish feel pain or not.

An example of the changes in social expectations on anglers was demonstrated when an activist group used the 7WRFC conference as a platform to protest against recreational fishing. Their material consisted of an image of a cartoon fish and the slogan “I don't want to be mutilated” which was used to imply that angled fish were unnecessarily harmed by fishers. The Australian Future Leaders made sure to interact and ask as many questions as possible to try and understand their arguments and to consider the relevance to the debate in Australia.

Anglers must meet the challenges that arise from views relating to animal welfare, animal liberation, animal rights and people-animal mutualism, if they wish to gain and/or maintain their SLO. Demonstrating concern for fish welfare and implementing policies to effect custodianship of the fishery, shows that anglers are engaged with relevant values, important issues and behave responsibly.

Proactive and responsible policies can help to generate community confidence in recreational fishing activities. This can contribute to achieving angler goals including, enabling greater access, better resourcing and sustainability for the sector. In order to maintain SLO, anglers have recognised that the welfare of the fish they catch is of the highest importance. This is demonstrated by the significant research into fish welfare and release procedures. These have been adopted as best practice by the sector and are constantly updated as informed by the relevant science.

Issues of fish welfare are currently being addressed with scientific research on the most effective ways to humanely dispatch individual fish species and processes that allow fish to be released in the best condition possible. An example of this was presented by Dr Ben Diggles. His Ikijime project and associated smartphone app, provides anglers with easy to access information about the humane processing of fish for consumption.

Overall, the maintenance of a SLO for recreational fishing was demonstrated to rely on the ability to understand and be responsive to evolving social values. Communicating and advancing best practices to address community concerns and aligning with social values where possible, is necessary. Innovative techniques and theoretical applications offer mechanisms to facilitate this objective.

The information presented and discussed relating to social licence was beneficial for the development of understanding and necessary roles Future Leaders will play in Australia's recreational fishing sector.

g) Southern Hemisphere Recreational Salmonid Fisheries

There was a significant amount of information available through presentations and conversations with delegates, about the management of salmonid fisheries. Some of these concepts have the potential to provide direction for future management and enhancement of Australian salmonid fisheries.

Helen Keeling, of New Zealand discussed the introduction of a back-country fishing license, on top of a regular license, as a way to manage angler traffic on popular wilderness waters. This ballot system is an innovative way to manage high value catch and release trout fisheries such as the Greenstone-Caples river. This particular waters are difficult and expensive to manage due to their accessibility being by helicopter of overland trek, therefore this form of licensing allows fisheries managers to recoup the cost or management from that particular water. Furthermore, the ballot system improves overall angler satisfaction by reducing the fishing pressure and allowing a true wilderness fishing experience.

Michel Dudual presented the findings of his insightful research into the inequalities of angler success in the New Zealand Taupo fishery. This unique study found increasing inequality in angler catches, as fish abundance declined. The data behind this positive relationship between inequality and low abundance, revealed that where abundance decreased, unsucessful anglers catching even less fish was a major contributor to rising inequality. Successful anglers, however, were less affected by fish abundance.

There were presentations with adaptable or transferrable knowledge to southern hemisphere salmonid fisheries. Robert Arlinghaus, discussed his studies into fish stocking practices in naturally sustaining populations of fish. He argued that anglers have an overly simplistic outlook on improving fisheries, being; 'More fish stocked equals better fishing.' In Germany, over 70 million fish are stocked into wild - self sustaining populations each year.

Through various studies, Arlinghaus found that in self sustaining populations, there is no improvement in overall fish numbers, nor the measured quality of the fishing experience to the angler as a result of stocking. However, due to continual overstocking, there were genetic adaptations occurring, causing a loss of the local resilience that had developed through natural selection. With Trout being one of the highest stocked fish in south-east Australia

waters, this information is relevant to fisheries managers in coordinating recovery of trout populations in Victoria and New South Wales.

Discussions between eastern Australian future leaders and West Australian fisheries managers, covered the presence of a warm water tolerant strain of Brown Trout. These fish populate the trout waters south of Perth. The resident fish have developed a genetic advantage over time and exposure to marginally higher water temperatures than those in the South-east. This presents an interesting opportunity for comparison with eastern Australian brown trout strains.

h) Technological Innovations in Recreational Fishing

The rate of technological advancement throughout the world is sometimes difficult to comprehend. Devices that fit in the palm of our hands are more powerful than any personal computer that existed only ten years ago. This has provided many benefits to society, especially in the areas of information distribution, communications and sharing of knowledge. Recreational fishers have also benefited from technological advances, and can now outfit themselves with high quality marine electronics that can show the ocean in more detail than ever before and fishing gear capable of fishing in a far more efficient way. Technology is even opening up access to new recreational fisheries. Perhaps a notable example of this is the affordability of electric fishing reels capable of fishing hundreds of meters deep targeting species that few recreational fishers had heard of a decade ago.

When applying technological advances in recreational fishing purely in the context of effort creep, it is easy to obtain a negative view on the effect of technology in managing fisheries. This however, is not necessarily the case. Technology has provided innovative and novel ideas that address age old problems for fisheries managers and researchers. The internet provides unprecedented ability for mass communication, and data collection is no longer limited to trained professionals.

The WRFC provided a platform for the promotion of efficient data collection methods in recreational fisheries. One notable example is the use of a smartphone application by The International Game Fishing Association to gather catch and effort data from fishers in the everglades region of Florida. IGFA Catchlog is a user friendly, interactive smartphone application which allows fishers to record trip information including time/date and catches which can be shared with scientists and fisheries managers. The trial project will investigate the feasibility of using catch data voluntarily reported by anglers.

Initial trials have been met with very positive responses by users. IGFA conservation director Jason Schratwieser suggested that key to engaging with fishers was the applications ability to act as a trip diary. Fishers can easily use the application to search through past fishing trips to check catches in similar fishing conditions. Fishers planning trips from home can also utilise the Catchlog website to view their personal catch history.

Scientists in the United Kingdom have also been utilising new and innovative technologies for engaging recreational fishers in Science. Kieren Hyder, senior scientist with the Centre for Environment, Fisheries and Aquaculture Science suggests in his presentation that "experience and knowledge of all parties enhances data quality and increases utility for both scientists and the angling community"

Hyder leads a project which is utilising web and smartphone application based logbook for freshwater fishers. The scientific benefits from this project include building an accurate spatial distribution of freshwater species in the UK, acting as a passive disease surveillance system and informing disease control strategies.

This project is ongoing and will likely provide an interesting case study on engaging recreational fishers in science by utilising modern technologies.

Extension and Adoption

In Australia the economic importance of recreational fishing is already a well recognised topic. Recreational fishers and fisheries managers, should continue to gather and assess data in order to better understand the value of recreational fishing and to make well informed decisions when allocating scarce resources, to competing interests. In areas where recreational angling provides a greater economic impact than other types of fishing, it may be possible to consider the establishment of recreational-only fishing zones, or allowing well managed recreational fishing in marine parks, where appropriate.

There does appear to be scope to better incorporate recreational fishers in State and Commonwealth managed marine park networks. Any such developments or changes, should follow due process and include an assessment of threats and risks posed by recreational angling, to the stated conservation objectives. The value and benefits of including recreational fishers as active custodians and providers of citizen science, should also be considered and incorporated into the assessment process.

Local managers should continue to support co-management initiatives and citizen science with regard to conservation management and stock assessment. There is scope to strengthen and broaden the links between anglers, fisheries and conservation managers, as well as research organisations/institutes. In order to be a successful pathway, and for the community sector to function as an effective partner, this avenue may require targeted investment in organisational and people capacity.

While co-management and angler-driven programs have been introduced in some jurisdictions in Australia there are opportunities to expand and further refine this type of management. Angler-driven projects, like the Certified Angling Tidal Guide program , would allow for enhancement of knowledge within the recreational sector, as well as provide a more

accessible way to communicate and increase the access of managers/researchers to receive valuable data from the the recreational sector.

The future leaders group would like to acknowledge the high number of Australian presentations on innovative governance and management of recreational fisheries. This demonstrates Australia's current commitment in this area. It is particularly important for Australia to further promote this knowledge, experience and commitment, in order to remain a leader within the field.

It should also be noted that while the success of innovative governance and co-management projects in some Australian states puts them in the position of being world leaders, other states are significantly less developed in this area. There appears to be a notable difference in the innovative approaches, fishery enhancement, co-management projects and data availability for recreational fisheries in Australia, in favour of states with a licensing system over those without. Given the domestic examples of worlds best-practice, addressing this need for innovation and adoption of co-management and community engagement, should be a top priority in underdeveloped jurisdictions.

Along with greater community involvement in fisheries management, the Australian recreational fishing sector must be sure to accept the notion that social values are not static, but are constantly evolving. With this, the expectations regarding the treatment and use of the environment, its individual animals and resources, place a responsibility on anglers to maintain their access to these resources. It is important that anglers and managers recognise this and continually evolve best practice methods for catching, releasing and harvesting fish in a sustainable way.

With growth in the popularity of catch and release fishing for a variety of reasons, clear communication about the assessment of fish prior to release and correct handling procedures is needed. In some areas/fisheries, this already exists and should be applauded. Undoubtedly, however, there is scope to expand these projects. Priority species and practices should be identified, with programs for intervention/education devised. States should liaise with each other to share information about the broader applicability of local projects and community NGOs/ Peak Bodies should partner with fisheries managers and scientist to deliver these projects as necessary

Recently, there has been significant investment from the Victorian and New South Wales governments for the investigation, ongoing monitoring and recovery of naturally recruiting salmonid fisheries. The findings of Arlinghaus in studying stocking into naturally recruiting fisheries, is mostly transferrable, in this instance and could be considered by fisheries managers in their plans. There is also opportunity to explore the translocation of warm-water tolerant Brown Trout from Western Australia, to Victorian hatcheries for trials within wild populations.

Due to the state based management of recreational fisheries in Australia, some of the above recommendations may already be operating in certain jurisdictions, although not in others. This highlights the need to expand cross-jurisdictional communication at the peak body and fisheries management level where possible. One of the resounding conclusions from the future leaders group was the irony of travelling across continents to learn significantly from our interstate counterparts. While the networks created during this conference will be one of the enduring benefits of this undertaking, the need for more focus and investment on sharing at the domestic level should not be underestimated.

Further Development

The Future Leaders are committed to assisting with the preparation of the 2015 Australian National Recreational Fishing Conference. The group will be seeking feedback from state and territory representatives and their organisations about priority issues and discussion topics. This feedback will help shape the themes and agenda for the conference. We will also be seeking expressions of interest from potential presenters.

The budget and location for the event still needs to be finalised. This will have some bearing on possible keynote speakers to be invited. The group has formed connections and networks with leading academics and fisheries managers from around the world and is well placed to assist with these recommendations and contacts.

In addition to the 2015 National conference, individuals from this group have made commitments to share their experiences and knowledge gained in a number of ways, not limited to, but including; Reporting to their host organisations, authoring articles in state and national publications and hosting workshops/events to communicate all or part(s) of key concepts and knowledge gained at the WRFC 7.