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# **Defining a resource sharing option in a multi-sectoral fishery: using the Queensland Coral Reef Fin Fish Fishery as a test case**

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**The over-arching principle is that with the right allocation policy, complemented by strong fisheries management, fish don't need to be fought over.**

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## **Defining a resource allocation option in a multi-sectoral fishery: using the Queensland Coral Reef Fin Fish Fishery as a test case.**

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

**Report of workshop to consider “defining a resource sharing option in a multi-sectoral fishery: using the Queensland Coral Reef Finfish Fishery as a test case”**

**Convened by James Cook University (JCU)**

**30<sup>th</sup> April – 1<sup>st</sup> May 2015**

**FRDC (2013/230)**

**The over-arching principle is that with the right allocation policy, complemented by strong fisheries management, fish don’t need to be fought over.**



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# Abbreviations

<b>ALP</b>	Australian Labor Party
<b>CRFFF</b>	Coral Reef Fin Fish Fishery
<b>CSTFA</b>	Centre for Sustainable Fisheries and Aquaculture
<b>DoE</b>	Department of the Environment
<b>EPBC</b>	Environmental Protection and Biodiversity Conservation Act 1999
<b>GBR</b>	Great Barrier Reef
<b>GBRMP</b>	Great Barrier Reef Marine Park
<b>GBRMPA</b>	Great Barrier Reef Marine Park Authority
<b>GBRWHA</b>	Great Barrier Reef World Heritage Area
<b>JCU</b>	James Cook University
<b>MP</b>	Marine Park
<b>QDAF</b>	Queensland Department of Agriculture and Fisheries
<b>QSIA</b>	Queensland Seafood Industry Association
<b>Sectors</b>	Fishing groups who strive for a share of catch or allocation
<b>Stakeholders</b>	Parties with an interest in how fishing is managed,

# Executive Summary

Fish stocks are finite resources, with access to exploit sought by multiple competing sectors. The allocation of these resources is a challenging task. Without a clear overarching resource allocation policy that incorporates a set of objectives agreed to by all stakeholder groups, allocation defers to political considerations. Until the recent Queensland state election, the Queensland Government and the Queensland Department of Agriculture and Fisheries (QDAF) have not had a functional resource allocation policy.

The recent elected Queensland government's pre-election policies incorporated a "Sustainable Fishing Policy" with a goal of improving the economic value of Queensland's fisheries resource by "adopting a fisheries resource allocation policy based on maximising economic value" (Chisholm 2015). However history has demonstrated that equitable allocation of a fisheries resources best incorporates many more aspects than a simple index of maximising economic value.

Further, in the absence of an agreed and formal allocation process, passionate debate about access and rights destabilises commercial and charter fishing businesses and frustrates recreational and traditional owner fishing interests and aspirations. This project, providing a neutral forum for constructive discussion, brought together stakeholders from all sectors of the Coral Reef Fin Fish Fishery (CRFFF) to a workshop, where resource allocation options for the fishery was developed. The allocation option recommendations were defined by a group of agreed guiding principles and fishery attributes, rather than an explicit prescription of fishery shares, rights and access arrangements. Sectors contributing to the workshop were the commercial, recreational, and charter fishing sectors, Traditional Owners, plus Conservation and Management agencies, supported by technical and scientific advice from James Cook University and the Great Barrier Reef Marine Park Authority.

## Background

In recent years, the CRFFF has been impacted by a number of natural events that have negatively impacted the catch rates of coral trout (*Plectropomus leopardus*), and thus the economic stability of the commercial sector where profit is strongly linked to the live export of coral trout. Over the last decade the asset value of commercial quota has been reduced to less than 10% of peak value. QDAF introduced a harvest strategy in 2014 to allow the coral trout stock to recover, reducing the value of the commercial quota unit and the annual commercial catch.



Concomitantly, there is widespread concern that the catch taken by the recreational sector is increasing. While recreational catch data are sparse, vessel registrations of “reef capable” vessels have increased significantly over the last decade. It has been suggested the reduction in commercial catch created by the harvest strategy is being utilised by the recreational fishery rather than contributing to re-building stocks.

The absence of a global TAC for the coral trout fishery and the lack of an agreed resource allocation policy are generating concern for some stakeholders. There have also been expressions of interest from traditional owners towards entering into commercial fishing. Existing charter operators are also concerned about the security of their businesses. In the background, threats to the health of the Great Barrier Reef continue and conservation interests are as always enthusiastically championing sustainable extractive use.

### **Objective**

The project had the primary objective of:

*“Identifying a mutually preferred resource sharing option for the CRFFF. A resource sharing option was defined as an agreed group of guiding principles (or objectives).”*

### **Methodology**

The project used a multi-stakeholder workshop to bring together representatives from each of the designated stakeholder groups to discuss what guiding principles (objectives) should form the basis of, and be incorporated in a resource allocation option (policy). To focus discussions, stakeholders were asked to consider resource allocation options that may apply to the Queensland CRFFF.

The stakeholder workshop was also supported by a meeting of Great Barrier Reef Marine Park Authority (GBRMPA) Reef Guardian Program fishers. A group of Reef Guardian Fishers met and discussed resource allocation the day prior to the project workshop. The outputs of the Reef Guardian workshop were extended to the project workshop.

### **Results/key findings**

The workshop participants agreed on and propose that five relevant sectors should be considered in resource allocation: the commercial, recreational, and charter fishing, traditional fishing and conservation sectors. While some other Australian states manage and allocate fish to the charter fishing sector via the recreational allocation, workshop participants agreed that the business security of a growing charter fishing sector would be enhanced if this sector was considered explicit and independent

from the recreational sector. Furthermore, the charter sector would be able to trade fishing units (rights) with the commercial sector, potentially bringing greater stability to the value of fishing rights. A list of primary objectives of a resource allocation option and thus policy were also agreed on and include:

1. Consider foremost ecologically sustainable fishing;
2. Use evidence based management (based on robust data and science);
3. Integrate biological, ecological, economic, social and cultural inputs;
4. Be consultative and transparent.

Workshop participants further explored and defined a list of “Future Fishery Attributes” that the application of the primary objectives should seek to deliver. The “Future Fishery Attributes” included:

1. Ecological Sustainability;
2. Global and dynamic consumptive TAC ;
3. Equitable initial allocation;
4. Commercial viability;
5. Social performance;
6. Social licence;
7. Cultural values;
8. Community values & expectations;
9. Discretionary allocation;
10. Co-management;
11. Government recognition;
12. Data collection;
13. Futureproofing;
14. Monitoring, evaluation and review (MER);
15. Sector specific management.

The workshop also acknowledged consideration of alignment with international target reference points for areas of international conservation significant world heritage areas (WHA) such as the Great Barrier Reef (e.g. such as managing fishing within 40% biomass, or MEY rather than MSY).

The workshop finally considered and discussed the challenge(s) associated with an allocation policy based on “maximising economic value”. The key messages from this discussion were:

- The incompatibility of the usual “revenue” indicators: i.e. commercial GVP compared with recreational experience expenditure;
- Allocation is about providing the most benefit to the community, and neither GVP or expenditure indicators provide a valid estimate of value in this context;
- Multiple publications repeat that the misuse of revenues and expenditure data will give misleading indications regarding allocation;
- The danger of this is management decisions by those who can come with arbitrary, incompatible and non-validated indices of the highest ‘value’, claiming economic benefit based on simplistic and

## **Implications for relevant stakeholders**

The workshop considered the implications for each of the designated sectors and relevant wider stakeholder groups from application of the mutually agreed attributes, recognising the following general stakeholder groups:

- Industry;
- Communities;
- Managers and/or policy makers;
- others where relevant.

The implications of this research are significant, particularly in light of the movement in some state jurisdictions in recent years that have made allocation decisions based on competing sector political considerations rather than by knowledge based informed open and transparent processes (such as a resource allocation policy) accepted and endorsed by all stakeholders. Often these considerations ignore the sustainability objectives and credentials of fisheries as well as the social and economic consequences to all sectors, individuals and businesses. Although significant benefits are often claimed to accrue as a result of such a re-allocation of resources among competing fishing sectors, there is no validated documented demonstration of such benefits.

The act of allocation in the absence of a guiding allocation policy and an agreed group of allocation objectives is a difficult task for managers. This project has addressed this providing an agreed list of allocation objectives to guide and inform future fishery allocations within Queensland's fisheries. This gives greater rights and access security and certainty for all fishing sectors. The importance of certainty of access in a fishery accessed by historically competitive sectors cannot be understated. Social, economic and sustainability values and general confidence to invest in the fishery are healthier in an operational environment of certainty, compared with an operational environment of uncertainty. The implications for managers and policy makers would also be significant as an agreed allocation policy leads to a more efficient and harmonious negotiation, decision making, management and allocation processes. Removing allocation discussions from what are largely ill-informed public fora should avoid wasted time and resources of management agencies while also minimising the uncertainties and tensions often experienced by industry partners.

## **Recommendations**

This report demonstrates that in the absence of political influence, in a fishery such as the CRFFF (not characterised by competing sectors with a long history of malice), competing fishery sectors (and more

broadly all fishery stakeholders) can agree on a range of objectives and fishery attributes from which a resource allocation policy can be constructed.

The most important recommendation from this report is to develop and adopt a resource allocation policy and processes before political intervention (government response to demands and competing sector agitation for favourable treatment outside the informed collegiate/collaborative approach) becomes the norm for allocating fish in Queensland. Political intervention in this context includes both government response to demands and competing sector agitation for favourable treatment outside the informed collegiate/collaborative approach highlighted in this report. An agreed and effective allocation policy, provides a higher likelihood that an agreed principle will be negotiated and supported by all fishery stakeholders and better outcomes will be achieved for the community at large.

The collegiate, constructive and respectful contributions of all attendees at the workshop are highlighted and greatly appreciated.

**Keywords**

Resource allocation, fishery attributes, fisheries management, common coral trout, Coral Reef Fin Fish Fishery.

# Introduction

The allocation of finite fisheries resources among competing sectors is a challenging task (McPhee & Hundloe 2004; Pomeroy et al, 2007). In the absence of a resource allocation policy or an agreed allocation process, sectors compete with each other to maximise their individual returns/share, often with little consideration for sustainability or conservation issues. Uncertainty in access or rights can erode stewardship and responsible use, as well as foster among and within sectoral fighting and distrust. In the absence of an agreed and legislated allocation policy, politics may step-in as a crude but potent tool to address perceived imbalances. Unfortunately, political decisions are not always compatible with long-term sustainability (eg O’Leary et al 2011).

In Queensland, many fisheries are multi-species, multi-sector, multi-gear and multi-market in nature and often include commercial, recreational, charter and traditional fishers. The needs and aspirations of these sectors can and do vary markedly. The commercial sector requires security of access for ongoing business and investment certainty; the recreational sector need suitable access opportunities that provide and meet reasonable expectations of catch and quality experience; the charter sector should have explicit recognition as distinct from recreational fishers in order to maintain business security and particular market profile; and traditional owners’ need recognition of opportunity for access and use, whether for cultural or commercial purposes. While the four sectors’ needs and aspirations vary, clear recognition of these different traits is needed before a resource allocation policy can be built.

In addition to extractive sectors of fisheries resources, there are also a number of non-extractive interest groups (stakeholders) including conservation, ecotourism and the general community who may not wish to actively participate in fishing *per se* but have an expectation to be able to buy quality local fish from retail outlets for family consumption. The general community has an expectation that our fish resources and the habitats they rely on are sustainably managed and shared equitably.

Conservation of marine habitats and ecosystems generally occurs via a network of areas closed to extractive activities. These same closed areas along with, though to a lesser extent, open-use areas then support ecotourism ventures and businesses. In Queensland a number of different marine park networks exist – the Great Barrier Reef Marine Park (GBRMP), the Great Barrier Reef Coastal Marine Park (GBRCMP); the Great Sandy Marine Park (GSMP); and the Moreton Bay Marine Park (MBMP). Each incorporates numerous area closures to all extractive activities. Marine Park (MP) declarations often include an allocation of fisheries resources to conservation, represented by those fisheries resources present within the closed area boundaries. Although MPs conserve a portion of the stocks of fished species, there is

additional interest for fished areas of some marine parks to be managed more conservatively than traditional management goals, e.g. to align/comply with international target reference points for areas of international conservation significant world heritage areas (WHA) such as the Great Barrier Reef (such as managing fishing within 40% biomass, or MEY rather than MSY) (Farmery et al 2014). Such conservation goals are yet to be defined, though need to be for inclusion in allocation processes.

In the absence of an allocation policy and explicit sectoral allocations, extractive users of Queensland fisheries are often questioning their right and security to access and extract. In recent years, the Coral Reef Fin Fish Fishery (CRFFF) has recorded an apparent shift in access or fishery shares. Anecdotal and some secondary data sources such as vessel registrations (GBRMPA 2014) suggest that the recreational sector's effort and thus catch in the CRFFF has been steadily increasing over the last decade.

During that same time period commercial catch, catch rates and thus profitability have been negatively impacted by the combined effects of tropical cyclones, labour shortages (due to competition with employment in mining) and rising costs of operation (Tobin et al 2010). Somewhat unsurprisingly, asset (quota) values have decreased to less than 10% of historic highs. The introduction of a harvest strategy has also reduced quota unit values (and thus TACC) over the last two consecutive fishing years.

A harvest strategy was introduced for coral trout at the beginning of the 2013-14 quota season in an effort to rebuild the coral trout resource and profitability in the commercial sector. The harvest strategy identified a target commercial catch rate that if not achieved would trigger a management response that reduced the value (weight) of the quota unit (initially, 1 unit = 1 kilogram of fish) thereby re-setting the TACC at a lower level for the on-coming season. Theoretically, the lowered TACC would provide rebuilding opportunities for the coral trout resource and allow future re-establishment of the full quota unit value (1 unit = 1 kilogram) once the resource had rebounded. The likely influence of the harvest strategy in achieving the resource rebuilding goal is being increasingly questioned by stakeholders as no global TAC for the fishery exists, and co-occurring fishery sectors (recreational, charter and indigenous) are not impacted by the harvest strategy. The concern is that the trout the commercial sector are "leaving behind" are potentially being removed by fishing activities of other sectors, limiting the impact of the harvest strategy. While there are no data to support the commercial sector's concerns, clearly a harvest strategy that targets the catch of only one fishing sector in a multi-sector fishery is less likely to be effective in achieving the stated objectives of the harvest strategies. It also undermines the likelihood of achieving a mutually agreed whole of fishery allocation policy.

This project had a single objective of defining a resource sharing option for the CRFFF. For clarity, rather than being a prescriptive allocation of catch among valid sectors, the resource sharing option is defined as a suite of core objectives supported by a comprehensive list of fishery attributes underpinning the policy. The goal is to begin a process by which a formal allocation policy is constructed by QDAF that allows for the different and often competing values of fishery sectors to be identified, valued and accommodated.

# Method

The project convened a workshop that was attended by representatives from each of the recognised stakeholder groups with interests in the Coral Reef Fin Fish Fishery (CRFFF) and the Great Barrier Reef Marine Park (GBRMP). Representatives from fishing, management and conservation groups attended (Appendix 1 for list of attendees).

Prior to the workshop attendees were briefed verbally (via telephone) and by a written briefing document (Appendix 2). The purpose of the pre-workshop briefing document was to clarify the project's purpose and objective with stakeholders, and also to initiate some preparatory thinking. Specifically, the briefing document included a "homework" task that asked attendees to consider what objective(s) or guiding principle(s) of resource allocation would be most important to them. To help with that task, the briefing document included a list of example objectives and guiding principles summarised from existing fisheries resource allocation policies from other jurisdictions including South Australia (SA), Western Australia (WA) and the Northern Territory (NT).

The workshop agenda (Appendix 3) was set by project staff consulting with staff from the QDAF, the GBRMPA and extractive fishery sectors. Initial discussions suggested that while the term "resource allocation" was known and identifiable to most, the concept and possible mechanics of a resource allocation process were not. This was likely reflective of the absence of a functional resource allocation policy for Queensland Fisheries. Thus efforts were made to pre-brief participants about how resource allocation operates in other jurisdictions and how allocation may be guided and applied in the Queensland context.



The workshop addressed three key tasks:

1. Define and agree on which fishing sectors should be considered in an allocation policy;
2. Define and agree on a list of objectives (or guiding principles) that would give context to and guide resource allocation; and
3. Compile a list of agreed fishery attributes that more explicitly describe some of the stakeholder desired outcomes of a resource allocation option.

Task 1 was facilitated by an initial introduction and discussion informed by the resource allocation policies currently being applied in Western and South Australia and the developing policy of the NT. The workshop also noted the current Queensland Government Sustainable Fishing Policy (see Appendix 4) that included:

*“Labor will recognise tourism related fishing for the first time as a distinct activity and develop the economic value of tourism-related fishing. Labor will develop a charter fishing Action Plan.”*

Task 2 was similarly facilitated by an initial introduction and discussion about the objectives (guiding principles) in the existing policies of WA and SA, and the developing policy of the NT. The workshop also noted the current Queensland Government Sustainable Fishing Policy that included:

*“Labor will adopt a fisheries resource allocation policy based on maximising economic value.”*

The outputs of the workshop completed by Robins & Smith (2012) were also re-visited.

Once an extensive list of potential objectives was developed via open discussion, participants were tasked to individually rank the objectives: Each person was allocated 20 points, which they were to distribute among the list of potential objectives at their discretion to reflect what objectives they perceived as the most important. A participant could choose to give all 20 points to one objective, or spread the points evenly among multiple objectives. The rankings were then combined (via a cumulative sum of scores) and discussed. Further discussion led to the selection of priority attributes of a fisheries resource allocation policy for the CRFFF.

Task 3 evolved *in situ* during the workshop discussion around task 2. Many attendees argued strongly that some of the objectives of existing policies were more aptly described as fishery characteristics or attributes. The discussed and agreed preference was to move forward with objectives that were more broadly aspirational, and these objectives would be complemented by more specific fishery attributes that could be quite prescriptive.

Finally, again recognising the January 2015 policy pledge by the Queensland Australian Labor Party “To improve the economic value of Queensland’s fisheries resource, a future Labor government will adopt a Centre of Sustainable Tropical Fisheries & Aquaculture

fisheries resource allocation policy based on **maximising economic value**", a presentation and discussion about typical economic valuation techniques of fisheries informed the workshop.

# Results

## Workshop notes and outcomes

### *Opening Remarks and Workshop Context*

The meeting commenced with Facilitator (Professor Rob Lewis) welcoming attendees and providing an overview of the purpose of the 2 day workshop, highlighting the biological renewable nature of fish resources, the need for evidence based management, the need for a global TAC and clear rights of access and allocation of catch between sectors. It was highlighted this needs to be consistent with jurisdictional legislation and policies, as well as take into consideration the particular regional requirement to accommodate World Heritage Area (WHA) values, EPBC objects, FAO guidelines and Native Title Act. The workshop also acknowledged the recently declared Sustainable Fisheries Policy that seeks to allocate fisheries resources based on maximising economic value.

### *Background*

A number of speakers made short introductory presentations to inform the workshop on resource allocation, fishery management, catch and stock assessment history and overview of the government's current policy regime:

- |                                   |  |
|-----------------------------------|--|
| 1. Professor Rob Lewis            | What is resource allocation?                                       |
| 2. Dr Andrew Tobin                | Background to the project  |
| 3. Andrew Thwaites/Darren Cameron | Management history   |
| 4. Dr John Kung                   | Historical catches   |
| 5. Dr John Kung/Andrew Thwaites   | Stock assessment, harvest control rules                            |
| 6. Andrew Thwaites                | Overview of the Queensland government's sustainable fishing policy |

## **Task 1 - Sector confirmation: who are the players in resource allocation?**

The initial task of the meeting was to define which sectors should be explicitly considered in the allocation of fisheries resources in the CRFFF. Discussion and deliberation by the group was encouraged by an initial reflection on what sectors are explicitly considered in the resource allocation policies of other jurisdictions (Table 1). Workshop participants were also asked to note the current Labor Policy commitment to recognise tourism-related fishing for the first time as a distinct activity.

The major consumptive users being commercial and recreational sectors were unanimously proposed. Some discussion occurred on the status of the charter fishing, traditional fishing and the GBRMPA (Table 1). This discussion resulted in formal agreement in recognition of the designated sectors to be accommodated in any allocation policy as Commercial, Recreational, and Charter fishers, Traditional Owners and Conservation.

The inclusion of the charter fishing sector as a designated sector reflects the Labor Policy statement as well as previous management deliberations (particularly about the management of snapper in the Rocky Reef Fin Fish Fishery) where the charter fishing sector have been considered as an individual group. Previous research conducted by the project team has also explicitly considered charter fishing as a separate sector, being well received by the industry (Tobin 2010).

Table 1 Workshop participants agreed on and defined five sector groups that should be explicitly considered in a resource allocation policy for Queensland’s fisheries resources. The discussion and deliberation was facilitated by recognition of what sectors are considered in the resource allocation policies of other jurisdictions.

<b>South Australia</b>	<b>Western Australia</b>	<b>Northern Territory</b>	<b>Queensland</b>
Commercial	Commercial	Commercial	Commercial
Recreational	Recreational	Recreational	Recreational
Traditional	Traditional	Traditional	Charter
Charter	Aquaculture		Traditional
			Conservation
			(GBRMPA)

To further clarify the five sectors, a definition of each was workshopped and mutually agreed:

1. Commercial fishing: operating for commercial gain and profitability under licence with conditions including individual transferable rights;
2. Recreational fishing: operating for fishers to participate in a quality personal fishing experience including take for immediate personal/family needs, and including social amenity;
3. Charter fishing: operating for commercial gain providing platforms for recreational fishers (usually in groups), frequently multiple day trips though recognising a diversity of charter businesses exist;
4. Traditional fishing: operating to maintain culture and source (artisanal) of traditional, cost effective and cultural food;
5. Conservation: in particular the Great Barrier Reef Marine Park Authority (GBRMPA) recognising the fishery occurs in a World Heritage Area (WHA), the management of the fishery (including resource allocation) should be precautionary to align with and maintain world heritage accreditation criteria.

## Task 2 - Resource Allocation Objectives (Guiding Principles)

As an introduction to the workshoping of the Objectives (or Guiding Principles) of resource allocation, participants re-visited the outputs of the 2012 “Defining a way forward for the Queensland Reef Line Fishery through evaluating resource sharing research and development options with stakeholders” (Robins & Smith, 2012) workshop. This workshop reaffirmed the shared vision from the 2012 workshop, namely that each stakeholder group supported the common objective of:

“An ecologically sustainable fishery:

1. That is managed to provide security of access within a whole-of-fishery global TAC based on recognised rights;
2. With real time data allowing real time management (including co-management) responses;
3. That is shared amongst all users to create a profitable fishery and quality recreational fishing experiences”.

The government’s emphasis of “maximising economic value” was also noted.

To further encourage the discussion and debate of allocation objectives, the workshop considered those objectives and guiding principles used in SA, WA and the NT. A table of cumulative objectives was constructed to highlight those objectives common across jurisdictions as well as those objectives that were unique to a jurisdiction (Table 2). The table of cumulative objectives also allowed participants to consider the range of objectives that other jurisdictions have used.

The resulting discussion between the sectors provided opportunity for clarification of each objective to ensure common group recognition of what each objective meant and represented. Once all participants were comfortable with the meanings and representations of each objective in the cumulative list, participants scored their preferred objectives using their 20 discretionary points. After each participant had scored the objectives, a cumulative total score for each objective was calculated for the group as well as each sector. The objectives were then ranked based on the group total, though sector specific scoring was also presented and discussed (Table 3).

Table 2 The objectives (guiding principles) of the resource allocation policies from South Australia, Western Australia and the Northern Territory were tabulated to identify both common and unique objectives.

South Australia	Western Australia	Northern Territory
<p><b>Fishing is to be fostered:</b> all sectors contribute social and economic benefit, and are to be fostered to benefit to whole community.</p>	<p><b>Common property resource</b> managed for benefit of present and future generations</p>	<p><b>Stewardship:</b> fisheries resources are a common property resource, and must be managed for the benefit of current and future Territorians.</p>
	<p><b>Sustainability</b> is paramount</p>	<p><b>Sustainability</b> is paramount</p>
<p><b>Best data &amp; science:</b> allocation and management uses best information</p>	<p><b>Knowledge and data:</b> best available</p>	<p><b>Information:</b> decisions based on best available data – <i>ecological</i>, cultural, economic and social.</p>
	<p><b>Global TAC:</b> allocation to sectors</p>	
	<p><b>TAC respected:</b> total catches do not exceed</p>	
	<p><b>Sector specific management:</b> to control harvest</p>	
<p><b>Optimum utilization:</b> best use of resource for community at-large.</p>	<p><b>Allocation for optimum benefit:</b> including economic, social, cultural and environmental factors</p>	<p><b>Strategic development:</b> allocation decisions should be justifiable - balancing economic, social and cultural benefit to the NT providing for optimal utilisation of the resource.</p>
	<p><b>Be adaptive:</b> to allow for changes in allocation as required</p>	
<hr/> <p><b>Continued over .....</b></p> <hr/>		

South Australia	Western Australia	Northern Territory
<p><b>Equitable distribution:</b> <u>allocation distributes the benefit of use fairly among users.</u></p>	<p><b>Management tools:</b> must allow access to allocation, not stifle it.</p>	<p><b>Structural adjustments:</b> should be payable when there is clear and demonstrable financial loss</p>
<p><b>Compensation:</b> payable if acquisition of commercial rights occurs</p>	<p><b>Certainty for users:</b> respect for users, particularly those with livelihood dependence</p>	<p><b>Certainty:</b> allocation shall provide stability and certainty. <u>Each sector will be allocated a proportional share.</u></p>
<p><b>Opportunity to be heard:</b> transparency and participation</p>	<p><b>Rights of users recognised:</b> initial allocation respects and considers recent history</p>	<p><b>Transparency:</b> consultation and involvement of sector and public interests.</p>
<p><b>Rights of users recognised:</b> initial allocation respects and considers recent history</p>	<p><b>Customary use:</b> allocation will ensure rights of traditional owners are respected and maintained.</p>	<p><b>Goal orientated:</b> seek to meet the objectives of the Fisheries Act.</p>
<p><b>Opportunity to be heard:</b> transparency and participation</p>	<p><b>Practicality:</b> Decisions must be easy to understand and enforceable by law.</p>	<p><b>Social performance:</b> decisions must strive to maximise long-term social benefits.</p>

The scoring emphasised that all attendees, across all sectors, considered “sustainability/conservation” the most important objective of a resource allocation policy. The “sustainability/conservation” objective was scored almost three times as high as any other objective receiving, 28% of scores (Table 3).

Table 3 The final ranked cumulative scores for each objective by each stakeholder group ordered by decreasing importance. The top three objectives for each sector and the overall group are highlighted in green, orange and yellow in decreasing importance. The total numbers of participants for each sector are included at the bottom of the table. A box highlights the scores of the charter and traditional owner sectors as only a single participant represented each and as such these scores need to be considered cautiously.

	Recreational	Commercial	Research	QDAF	Conservation	Charter	T.Owner	TOTAL
Sustainability/conservation	19	29	23	9	27	6	3	116
Best data & science	7	9	3	7	12	6	2	46
Allocation for optimum benefit	6	11	6	2	10	0	2	37
Transparent and consultative	7	7	4	2	12	0	3	35
Global TAC	2	10	6	2	9	0	0	29
Adaptive management	4	5	8	2	8	0	0	27.5
Certainty & stability	5	5	0	3	4	5	0	22
Common property recognition	2	3	3	5	3	0	3	19
Practicality & simplicity	11	2	1	2	0	0	0	16
Strong compliance	0	7	3	1	1	0	0	12
Equitable distribution	3	0	1	1	4	0	2	11.5
Manage for profitability	2	5	1	1	2	0	0	11
Sector specific management	4	0	1	1	1	3	0	10
Fund compensation as needed	2	6	0	1	1	0	0	10
Respect customary use	0	0	0	1	5	0	3	9
Maximise social benefit	6	1	0	0	0	0	2	9
Number of participants	4	5	5	2	3	1	1	



By comparison to the prominence of the “sustainability/conservation” objective to the workshop, the following ranked objectives were less clearly individually important. The next three ranked objectives were “best data & science”, “allocation for optimum benefit” and “transparent and consultative” and received the collective scores of 11%, 9% and 8% of scores respectively (individual scores of each stakeholder can be viewed in Appendix 5).

However there were some sector specific variations in ranking. For example, the second most important objective by sector was:

- Commercial - “practicality & simplicity”;
- Recreational - “allocation for optimum benefit”;
- Research - “adaptive management”;
- Management - “best data & science”;
- Conservation - “best data & science” and “transparent & consultative”

The sector variation in ranking was discussed and the group resolved to develop a list of four primary objectives to form the basis of and guide a resource allocation policy. The agreed objectives were:

1. Ecological sustainability: the sustainability of the species fished and the ecosystem that supports that species and stocks is paramount;
2. Evidence based best data and science: allocation decisions will be based on the best available science and information. In data limited situations, allocation decisions will use a risk management approach where the ecological sustainability of the resource is paramount;
3. Integration of biological, ecological, economic, social and cultural inputs: any allocation needs to explicitly consider a quintuple bottom line of biological, ecological, economic, social and cultural factors;
4. Consultative and transparent: the outcomes of an allocation should be made with full transparency, and all stakeholders should be consulted and have opportunity for input.

The workshop noted that the four objectives are a short list compared with the more extensive objective lists of South Australia (8), Western Australia (9) and the Northern Territory (11). However participants discussed and agreed that some of the objectives included in other jurisdictions policies were quite prescriptive and were more appropriately considered fishery attributes (or specific aspirations) rather than overarching allocation objectives. The participants then considered and formed a list of fishery attributes that a resource allocation policy should strive to deliver.

## Task 3 – Fishery Attributes of a Resource Allocation Option

The list of fishery attributes was developed recognising that any agreed resource allocation objectives need to be accompanied by more specific aspirations the resource users have regarding the outcomes of the policy. The list is not exhaustive. It is important to note some of the attributes were not universally supported. Some repetition and overlap is present between some of the attributes and objectives and among the attributes themselves. Further discussion is required to better define the fishery attributes and what the outcomes for each sector of a particular fishery attribute may look like.

1. **Ecological Sustainability:** In well-managed fisheries, the health of the stock and the broader ecosystem is paramount. In addition, recognising the CRFFF occurs in a WHA, a more conservative biomass benchmark for assessing the status of fished species may be appropriate. NOTE: Although agreed in principle, this attribute generated debate about what level of extra conservation of fished biomass is appropriate given the existence of MPs (no fishing areas) is viewed by some stakeholders as precautionary enough.
2. **Global and dynamic consumptive TAC:** A global dynamic consumptive TAC is set by stock assessment and regularly reviewed. A dynamic TAC will be variable and sustainable for the current stock status and will be informed by timely stock assessments, influenced by factors that include variations in recruitment strength, increases in collective effective fishing power and fishing mortality (F), and in the case of GBR fisheries impacts of cyclones and other environmental and anthropogenic influences.
3. **Harvest Strategies:** The global TAC can be dynamic and harvest strategies would be needed to proportionally alter each consumptive sector's catch shares (based on % or units of the TAC, not tonnage). NOTE: Some passionate views were expressed by the commercial sector that although a harvest strategy has been applied to the commercial TAC and reduced the value of quota and thus volume of catch, a commensurate reduction in catch by co-occurring sectors has not occurred and needs to be addressed as a matter of urgency.
4. **Equitable initial allocation:** The initial allocation of the global TAC, via Individual Transferable Quota (ITQ), must reflect contemporary and existing access and shares as well as Traditional Owner commercial opportunity. The initial allocation needs to explicitly consider the benefits of:
  - a. Cross-sector tradable units;
  - b. Temporary leasing/trading, compensation, with a consideration for monitoring and possibly limiting drift between sectors (to ensure overall community benefit is maintained);
  - c. The identification and removal before allocation of any long term latent effort/licences.
5. **Commercial viability:** Once allocation (ITQ) has occurred, the input controls on the commercial sector should be reviewed to ensure there are no redundant management tools that limit access via market transactions and maximising economic returns. The development and maintenance of commercial viability will require:
  - a. Economic data to track profitability trends (costs, revenue);
  - b. Monitoring of quota price, lease price, business numbers;

- c. Review of input controls;
- d. Compensation when required.

NOTE: Some management changes have occurred including the ability to trade dories between vessels so that individual businesses can increase catching capacity. It is noted that this management option is not applied evenly across all vessels that access the fishery.

6. **Social performance:** While commercial access and profitability should not be limited by redundant management tools, again once allocation has been set the input management controls relevant to the recreational and charter sectors should be reviewed. To facilitate quality recreational/charter fishing experiences there is a need to understand what the important metrics of a quality fishing experience for this sector and social performance are. They may include (but are not limited to):
  - a. Persistent catches of trophy fish (large trout, > 2 kg);
  - b. Maintenance of reasonable catch rates;
  - c. Repeat customers (charter);
  - d. Monitoring of recreational fisher satisfaction (in partnership with expectations, via surveys);
  - e. Enhanced infrastructure (ramps, reefs, services).

NOTE: Some management changes have occurred in this area and include an extended bag limit applied to multi-day charter businesses, and an exclusion for some vessels from the spawning closures recognising these management tools may impede social performance and thus business performance.
7. **Social licence, community acceptance and market support:** More broadly across the fishery and all stakeholders is a recognised aspiration for community acceptance and “social licence” to operate. For example, third party accreditation such as Marine Stewardship Council (MSC) and political support are desired. Third party accreditation has both social licence and market attraction benefits.
8. **Cultural:** The maintenance of indigenous peoples’ access to CRFFF resources for cultural or nutritional needs, and opportunity to access resources for economic development
9. **Community values & expectations:** There is a need for the seafood experience from the CRFFF to be balanced against conservation needs, and recognition that fishers can be strong stewards of the resource:
  - a. Monitoring of community values and expectations (e.g. via consumer surveys; satisfaction surveys).
10. **Discretionary allocation:** Allocation for discrete tasks such as collecting limited numbers of CRFFF species for research and aquaculture brood stock.
11. **Co-management:** Arrangements between sectors to incorporate a joint responsibility for allocating and managing allocations on a cooperative basis. Co-management may range from a consultative model where sectors advise the process, to an informative model where co-managing sectors have joint decision making powers.
12. **Government recognition:** Stronger relationships between management (both the QDAF and the GBRMPA) and stakeholders are required and desired. Recognition needs to occur in a number of areas and includes recognising:
  - a. The contribution that stakeholders make to management of the fishery;

- b. That sustainable and effectively managed fishing is a legitimate activity within designated areas of a marine park;
- c. The value that the fishery provides to the community (e.g. tourism, agriculture, forestry, mining) have good data sets about jobs, revenue – similar data are required for fisheries).

13. **Data collection:** More robust and extensive data is required to better manage the CRFFF and inform allocation. This extends to the improved modelling of the stock status and the ecological systems they operate in.

- a. RECREATIONAL
  - i. Improve the sampling frame to provide more accurate catch estimates;
    - 1. Currently there is no recreational licence to provide a sampling frame;
    - 2. Need data that enables regional assessment;
    - 3. Consider those stakeholders that are not captured in current sampling frames e.g. grey nomads;
  - ii. Effort estimates through boat ramp surveys / catch data
  - iii. Embrace technology (e.g. web based portals), but be careful of biases/limitations – likely the best program will be supported by a range of tools to cater for diverse sector needs;
  - iv. Data needs to include a measure of satisfaction and “willingness to pay” to provide data for social and economic measures.
- b. COMMERCIAL
  - i. Embrace technology (see above)
  - ii. Bio-economic modelling used to review under-utilised species with a view to maximising economic return;
  - iii. More strategic enforcement of the quota system (known loopholes are being exploited).
- c. TRADITIONAL FISHING (see Schnierer 2011)
  - i. Design a sampling frame to allow estimation of traditional fishing catch
  - ii. Explore the cultural significance of coral reef fishes
  - iii. Understand traditional fishing knowledge needs
- d. An adaptive management framework needs to consider alternative data sources to allow management to respond in a timely manner e.g. stock and fishery recruitment indices may be used to predict recruitment pulses of commercially valuable fish.

#### 14. **Monitoring, Evaluation, Response (MER)**

- a. Need to be innovative in designing data collection programs in recognition of difficulties in allocating resources to data programs;
- b. Seek opportunities for sector driven data collection programs / citizen science;
- c. Need independent data sources to support adaptive management (see above).

#### 15. **Sector specific management**

- a. Initial allocations to sectors need to be a proportion of the TAC (%) in common units (e.g. kg coral trout), recognising that this may be converted to a more operational unit (which may be different for different sectors) e.g. number of fish; charter days (with difficulties identified in monitoring against allocation);
- b. Consideration could be given to trading units between sectors;
- c. Regional management options to be considered (previous discussions have included regional quotas, quota penalties for fishing outside home region, differential size limits in different regions).

## Economic considerations – economic value

The workshop specifically addressed the requirement for allocation based on “maximising economic value”. This requires appreciation of the economic data and modelling needs most suitable to addressing the issue and the recognised incompatibility of many of the economic indices commonly prosecuted by different sectors to validate their respective claims of significance to the economy, making it impossible for inter-sector comparisons therefore comparable evidence based allocations. The workshop was informed by a presentation on this topic (Renae Tobin and James Innes: “Allocation based on economic value”). The key messages were:

- The incompatibility of the usual “revenue” indicators: i.e. commercial GVP (financial benefit from selling fish) compared with recreational experience expenditure (amount spent to catch fish)
- Allocation is about providing the most benefit to the community, neither of the above indicators provide a valid estimate of this value;
- Multiple publications repeat the misuse of revenues and expenditure data will give misleading indications regarding allocation;
- The danger of this is management decisions by who shouts the loudest.

Tobin and Innes advised on “what is value?” clarifying the economic definition for the key terms:

- Value - benefit enjoyed in excess of what was sacrificed (McLeod and Nicholls, 2004);
- Economic value - what consumers/recreational fishers are willing to pay for fish (rather than spend the same amount on other goods/services) or what commercial fishers are willing to accept as compensation;
- Willingness to pay generally decreases with each additional fish, willingness to accept compensation generally increases with each additional fish;
- The “net economic value” – the consumer surpluses and producer surpluses minus the resource costs.

Consumer surplus: net worth of the fish to the seafood consumer or recreational fisher after expenditure is subtracted from the total economic value.

Producer surplus: net economic value attributed to production

Resource costs: opportunity costs such as value of labor, boats, petrol, etc in the next best alternate use.

Tobin and Innes advised “to maximize total net economic value an allocation must equate marginal net economic values from each conflicting use of the fish stocks (i.e. resources should only be reallocated up to the point where the net marginal benefits in one sector are equal to the net marginal benefits in the competing sector)”. Typically this occurs via some variant of benefit-cost analyses. Only then can econometric indices provide sector value estimates that allow consistent and effective comparisons.

In addition, values can be social (Sutton 2014) as well as economic; non-market and market. The workshop recognised that historically the research, modelling and assessments have been heavily weighted to biological inputs to fisheries management and allocation issues. The workshop further agreed that this imbalance should be addressed, particularly with regard to appropriate benefit cost models. It recognised that this would require the provision or redistribution of adequate funds and long term adjustments to programs, capabilities and resources, as well as management and industry practices. Further consideration needs to be given to this issue to adequately and equitably advise the government on a “fisheries resource allocation policy based on maximising economic value”.

# Discussion

Until January 2015 there was no resource allocation policy to guide the allocation of fisheries stocks among competing sectors. The Government embraced a Sustainable Fishing Policy that seeks to “improve the economic value of Queensland’s fisheries resource” using a multi-pronged approach including the commitment to “adopt a fisheries resource allocation policy based on maximising economic value”. This project is timely, providing input from a full complement of Queensland fisheries stakeholders who considered what other objectives (beyond maximising economic value) may be needed and considered when the QDAF build a more complete and functional allocation policy.

The absence of a strategic, transparent and structured allocation policy significantly diminishes the economic value of Queensland fisheries. Where there is uncertainty concerning rights and access to fisheries resources, investment in fisheries is unlikely or at the very least precautionary. Lack of clear rights of access may also cause significant angst and uncertainty. Thus a complete and robust allocation policy is likely to improve economic value even without stating an explicit objective that is to “maximise economic value”.

## **Legitimate sectors in resource allocation**

Five sectors were identified and nominated as mandatory sectors to be included and considered in resource allocation. The sectors included four consumptive sectors – recreational, commercial, and charter fishers, and traditional owner – as well as the conservation sector (particularly the GBRMPA). The inclusion of charter fishing as a sector is contrary to resource allocation policies in other jurisdictions where the charter businesses are considered a vehicle for facilitating recreational fishing access, and are thus managed as such.

In Queensland, the charter fishing sector has expressed interest in being autonomous and in relation to the CRFFF, seeking potential benefits such as entering a quota pool with tangible access rights (quota units) that are tradable with the commercial sector. Notably, there is some support from within the commercial sector for this approach that would extend the quota pool and the number of trading partners, thus bolstering the economic status of the fishery. Finally charter fishing specific management already exists in the CRFFF with extended bag limits for multi-day trips, and permits allowing fishing during the annual spawning closures. The explicit recognition of the charter sector also fits with the current government’s desire to recognise tourism-related fishing as a distinct activity.

The fifth sector identified and nominated as having legitimate place in resource allocation was the conservation sector, represented in the CRFFF most notably by the GBRMPA. All workshop participants recognised the role the GBRMPA play in managing the GBRWHA and the activities that occur within. What the explicit recognition of the GBRMPA as a legitimate sector representing conservation means in terms of specific goals of resource allocation was discussed only briefly. While some of the extractive sectors

believe that the conservation goals of the GBR should be adequately covered by the existing MPA network, there was some discussion about the need to proactively manage the CRFFF within the WHA using more conservative fisheries abundance and stock assessment metrics and goals than are traditionally applied. For example, an over fished status is often a bench mark used to manage fisheries, and is declared when biomass drops below 40% of virgin stock values. There needs to be continuing discussion about what target or limit reference points are used to manage the consumptive take of fish by the CRFFF within the GBRWHA. This was endorsed by the workshop.

### **Guiding principles of resource allocation**

The workshop participants identified four core objectives that should form the basis of a resource allocation policy and discussion. Those core objectives were formed after considering and deliberating each sector's aspiration(s) for the CRFFF, while considering existing examples of resource allocation guiding principles used in other Australian fisheries jurisdictions (namely South Australia, Western Australia and the Northern Territory (Appendix 2)). The workshop discussion noted a number of objectives duplicated across a number of different jurisdictions. The workshop also noted that in some jurisdictions some guiding principles were more appropriately considered fishery goals or "fishery attributes", and the group considered the best approach was to consider a first and second tier of guiding principles.

The first tier objectives are designated the guiding principles, the second tier fishery attributes. The deliberation of guiding principle importance was helped by the use of a scoring system that clearly highlighted the universal importance of ecological sustainability of the fished resource and the habitat that supports it, to all stakeholders. While the group as a whole and all sectors supported this primary objective, important differences in key subsequent guiding principles were present between sectors. For example the recreational sector emphasised "simplicity & practicality", while the commercial sector considered "optimum benefit" and management & conservation nominated "best data & science".

The outcomes of the workshop highlight that co-occurring and sometimes directly competing sectors can mutually agree and move towards sharing a limited fishery resource provided an agreed list of guiding principles is developed. The common importance of "ecological sustainability" as the primary guiding principle for all sectors significantly aids this process. It is also undeniable that the allocation discussions are far more likely to be productive in the absence of sectoral confrontation and political influence.

It is important to note that some resource sharing tools are already in place in the CRFFF. The shares are not explicit and there is not yet a global TAC for, and shared amongst, the consumptive sectors.



# Conclusions

In conclusion, the workshop outcomes demonstrate that a resource allocation policy guided by a set of objectives agreed to by all stakeholder groups is clearly supported and in some instances desperately desired. The benefits are clear, removing the uncertainty and opacity that currently surrounds allocation. The recently commended Review of Queensland Fisheries Management (Hurry et al, 2014) that was not available at the time of the workshop, included the following:

*“In the absence of clear structure and “rules of the game”, passionate debates over resource allocation continue unabated without any clear sense of resolution, commercial fishers have difficulty in planning the future of their businesses, recreational fisheries are frustrated that angling isn’t given the recognition it deserves and Government officials lack a clear sense of direction and purpose in the management of fisheries.”*

The outcomes of this workshop together with the more theory-based and structured recommendations from the Fisheries Review (see Hurry et al 2014) equip QDAF with a welcomed mutually agreed sectors’ support base to further develop and implement an effective fisheries allocation policy for the CRFFF. The benefits are many, providing greater certainty to all sectors and the broader stakeholder community by the way of a defined purpose, structure and process that removes the conflict surrounding allocation of available stocks between the sectors whilst providing the fishers with certainty of allocation and security to invest.

# Implications

This outcomes of the workshop is the first step on the pathway of resource allocation for Queensland fisheries. The recent review of Queensland Fisheries Management structure and framework clearly identified a need to tackle resource allocation as a major issue (Hurry et al 2014). None of the stakeholder groups with an interest and investment in Queensland's fisheries dispute the need. The implications of this project should be significant provided government and management are committed to the Fisheries Review (see Hurry et al 2012) and the clear wishes of stakeholders as reported by that review, further supported by the workshop outcomes and participants of this project.

Without this, resource allocation decisions are influenced by populist vote in an opaque rather than transparent environment. The continuing competition for fish in the absence of explicit rights or shares will continue to foster conflict. The absence of a robust resource allocation policy leaves allocation decisions open to ill-informed and accepted outcomes rather than via a structured and mutually agreed approach, principles and evidence based decision making to which all stakeholders have committed and embrace.

The implications of adopting and acting on a resource allocation policy could be significant for the consumptive sectors of the CRFFF. For example, and as has been recommended in the Fisheries Review (see Hurry et al 2012), once clear rights of access and shares of the fishery have been allocated, the input controls that govern how fish can be accessed should be reviewed. For the commercial sector this should involve the review of all input controls that limit economic efficiencies; for the recreational sector a review should focus on providing a quality fishing experience through a sustainable and adequate allocation based on improved data and metrics on the sector's activities and contribution to regional and state economies. Similarly improved data and metrics associated with the charter fishing and traditional fishing sectors are required. Given the unique World Heritage Area status of the GBR any CRFFF review needs to address allocation requirements for additional trigger point criteria.

# Recommendations

1. The Workshop recommends the Queensland Government implement an evidence based Coral Reef Finfish Fishery Resource Allocation system to accommodate the equitable access of each of the designated sectors (commercial, charter, recreational, traditional and conservation).
2. Allocations primarily be based on the current stock assessments, and sustainability (Total Allowable Catch (TAC)) estimates of the relevant species and sub-stocks.
3. Allocations to each sector via designated proportionate share (Units not tonnage) of the TAC and where appropriate Individual Transferable Quota (ITQ) to individual operators.
4. Initial allocations to each sector and operator consider historic activity (suggest last 5 years) to maintain post-allocation relativity between sectors and operators. Transferability of units between and within relevant sectors (eg commercial, charter) provides ongoing sector(s) adjustment mechanisms.
5. Any “oversubscription” of demand on the TAC at any time is addressed through equitable proportionate reduction on the units allocated to each sector and/or operator.
6. The Queensland government establish Coral Reef Finfish Fishery Stock Allocation Advisory Committee, comprising representation from each of the designated groups, the fisheries research (stock assessment) and management community and to develop an allocation system consistent with this report and the recommendations above.
7. The Queensland government develop the legislative (Enabling and Sub-ordinate) framework and authority to implement the outcomes of this report and the subsequent Advisory Committee.
8. The Queensland government develop an extensive Community Engagement and Communication Program to consult with affected sectors and operators, key stakeholder groups including conservation and the community in general (local seeking affordable access to local fish species and processors/exporters maintaining valuable export markets).
9. Mechanisms for improved consultation with Indigenous communities
10. The Queensland government review information gaps required to inform the recommended approach (eg enhanced stock variability and sustainability, sector participation (particularly recreational), regional and export market economic value) and initiate programs to collect the data sets. The parameters and models derived from this initiative need to be compatible (“Economic considerations- economic value” section above) to allow comparable decision making and if necessary trade-offs (eg economic value estimates and when asked to take into consideration intangible factors such as “the quality of the fishing experience and individual well-being benefits”).

# Extension and Adoption

The outputs of the project have been extended to the end users through a number of face-to-face meetings, a Queensland Seafood article as well as numerous emails among interested parties (see Appendix 4). Resource allocation has become particularly topical in Queensland fisheries following the January 2015 election and accompanying Labor Party Sustainable Fishing Policy (Chisholm, 2015). The Sustainable Fishing Policy included the declaration of 3 commercial net free fishing zones on the Queensland east coast (<http://statements.qld.gov.au/Statement/2015/8/21/netfree-fishing-zones-for-central-and-north-queensland>). This declaration, in the absence of a resource allocation policy, has stimulated some fierce debate and media-based battles among the recreational and commercial fishing sectors as well as additional fisheries stakeholders World Wildlife Fund, Tourism Queensland and Association of Marine Park Tourism Operators. Project background and preliminary outputs have on numerous occasions been shared with all stakeholder groups, to encourage more informed discussion, yet as far as the declaration of 3 commercial net free zones are concerned, the “horse has bolted” and there has been no opportunity for the project outputs to be considered or adopted in this apparent politically expedient allocation.

# Project materials developed

If the project creates any products such as books, scientific papers, factsheets, images these should be outlined in this section outline and attach them where possible.

Not applicable to this project.

# References

Chisholm A (2015) Sustainable fishing. Labor's plan for fishing in Queensland.

Farmery A, Gardner C, Green BS, Jennings S. (2014). Managing fisheries for environmental performance: the effects of marine resource decision-making on the footprint of seafood. *Journal of Cleaner Production* **64**, 368-376.

Great Barrier Reef Marine Park Authority 2014, *Great Barrier Reef Outlook Report 2014*, GBRMPA, Townsville.

Hurry G, McClurg T, Souter D, Sissenwine M (2014). Taking stock: modernising fisheries management in Queensland. Report to Fisheries Queensland, Queensland Department of Agriculture and Fisheries, 132 pp.

McPhee, D and Hundloe, T (2004). The role of expenditure studies in the (mis)allocation of access to fisheries resources in Australia. *Australasian Journal of Environmental Management*. **11**: 34-41.

O'Leary BC, Smart JRC, Neale FC, Hawkins JP, Newman S, Milman AC, Roberts CM (2011). Fisheries mismanagement. *Marine Pollution Bulletin* **62**(12): 2642-2648.

Pomeroy, R, Parks, J, Pollnac, R, Campson, T, Genio, E, Marlessy, C, Holle, E, Pido, M, Nissapa, A, Boromthanasarat, S and Thu Hue, N (2007). Fish wars: Conflict and collaboration in fisheries management in Southeast Asia. *Marine Policy*. **31**(6): 645-656

Robin C, and Smith G (2012) Tactical Research Fund: Defining a way forward for the Queensland Reef Line Fishery through evaluating resource sharing research and development options with stakeholders. Fisheries Research and Development Corporation Final Report 2011/252, Canberra, Australia.

Schnierer, S. (2011). Aboriginal fisheries in New South Wales: determining catch, cultural significance of species and traditional fishing knowledge needs. Report to the Fisheries Research and Development Corporation, Canberra.

Sutton S., (2014) An assessment of the Social Characteristics of Queensland's Recreational Fishers, CRC Reef Research Centre, James Cook University.

Thebaud O, Innes J, Norman-Lopez A, Slade S, Cameron D, Cannard T, Tickell S, Kung J, Kerrigan B, Williams L, Little R (2014) Micro-economic drivers of profitability in an ITQ-managed fishery: an analysis of the Queensland Coral Reef Fin-fish Fishery. *Marine Policy* **43**:200-207.

Tobin, A., Schlaff, A., Tobin, R., Penny, A., Ayling, T., Ayling, A., Krause, B., Welch, D., Sutton, S., Sawynok, B., Marshall, N., Marshall, P. and Maynard, J. (2010) *Adapting to change: minimising uncertainty about the effects of rapidly changing environmental conditions on the Queensland Coral Reef Fin Fish Fishery*. Final Report FRDC 2008/103, Canberra.

Tobin, RC, Beggs, K, Sutton, SG, Penny, A, Maroske, J and Williams, L (2010). *Baseline Socio-Economic Data for Queensland East Coast Inshore and Rocky Reef Fishery Stakeholders Part B: Charter Fishers*. Technical Report No. 6. FRDC Project No. 2007/048, Fishing and Fisheries Research Centre, Townsville, Australia.

# Appendix 1 Workshop attendees and apologies

Facilitator	Rob Lewis	Science Without Bounds
Project staff	Andrew Tobin Renaë Tobin Leanne Currey Stephanie Slade	James Cook University James Cook University James Cook University James Cook University
Research	James Innes Richard Saunders	CSIRO QDAF
Management	Andrew Thwaites John Kung Darren Cameron Randall Owens	QDAF QDAF GBRMPA GBRMPA
Conservation	Jim Higgs	WWF
Traditional Owner	Wayne Butcher	Mayor, Lockhart River
Recreational fishing	David Bateman Bill Sawynok Robert Kennedy Michael Kaminski	SUNFISH InfoFish Services Burdekin Sustainable Fishing Alliance
Commercial fishing	Gareth Andrews Terry Must Greg Smith Dan Learoyd Neil Green Bill Gilliland	
Charter fishing	Bruce Stobo	
Apologies	Paul Aubin Lance Murray Jason Stanfield Cliff McCullough Eddie Riddle Adam Smith Martin Brennan Chris Calogeras	CAREFISH (Recreational fisher) Qld Recreational Fishers Network ANSA, President Northern Conquest Charters Fish City Charters Recreational spearfishing Recreational fishing Traditional fishing



# Appendix 2 Workshop briefing notes

## Defining a resource sharing option in a multi-sectoral fishery: using the Queensland Coral Reef Finfish Fishery as a test case.

Workshop – Thursday April 30<sup>th</sup> and Friday 1<sup>st</sup> May, 2015

### A synopsis for workshop participants

The purpose of this document is to give participants some lead-in information for the workshop: resource allocation background, what to expect from the workshop, and what will be expected of you.

Globally there is an increasing expectation that fisheries are managed in ways that are able to keep up with rapid change and evolving circumstances. The challenge has been for fisheries management to keep up with the demands of population growth, technological advances and the ensuing demand for resources. In addition, community expectations change through time so fisheries management needs to incorporate processes to allow for adjustments in fisheries allocations to occur.

In many countries the legislative structure used by agencies to manage fisheries has been in place for many years and is built around the ideas and thinking of the last century. They are focused on powers and mechanisms needed to manage commercial fisheries with little regard given to the management of other resource users.

The Queensland *Fisheries Act 1994* is one such legislative instrument. With regard to resource allocation, while the Act can be used to achieve certain outcomes, it does not explicitly require any particular allocation to be made. Instead those matters are guided by Queensland Government policy, terms of reference established for particular fisheries review or operational policies established by Fisheries Queensland.

Currently the Queensland Government has a specific fisheries policy that states it is based “...on the principle that fisheries resources should be allocated to those who would provide the greatest economic value from their access”.

Under the *Fisheries Act 1994* fisheries management in Queensland has focused mostly on sustaining fish stocks and while the Government has made some allocation decisions this has been to reduce conflict between users groups rather than manage a demonstrable excessive exploitation. Growth in fishing effort and/or catch in some fisheries and some sectors have been proactively managed by introducing a range of input and/or output controls. However, these actions have never explicitly considered allocation of catch among competing sectors.

Access to a fisheries resource has been managed, though not with any explicit consideration of allocation but rather right to access. Within a shared area, commercial fishers have a right to harvest that cannot be impeded by another sector. The creation of sector-specific fishing areas has mostly moved to balance this by the creation of recreational only fishing areas (ROFAs). There is no such thing as commercial only fishing

areas (COFAs). In some fisheries, the use of different fishing gears between the sectors creates angst as the capacity of commercial fishers to harvest, is compared to the capacity of recreational fishers to fish. These scenarios could be better managed with an explicit allocation policy. If competing sectors can agree on an allocation, then traditional input and/or output controls can be used to manage catch within those allocations. Fisheries allocations also need to vary through time and in response to changes in fishing efficiency or community expectations. Growth in some sectors may be prioritized over others. In this case, an allocation policy can be used to facilitate that shift.

Other challenges in Queensland fisheries include a charter fishing sector catch that is not explicitly recorded across all fisheries although the current Government fisheries policy does raise this as an issue than needs to be addressed. In addition, traditional owner participation in Queensland fisheries is not well addressed or catered for.

The new Government has introduced a Sustainable Fishing Policy that nominates 5 key areas for future attention.

The Policy states the following actions will occur:

- **Adopt a resource allocation policy based on maximizing economic value**
- Develop a charter fishing action plan
- Establish three net-free fishing zones in north and central Queensland
- Review the regulatory structure of commercial fishing to ensure the sustainability of Queensland's fisheries
- Extend the marine infrastructure fund and prioritise key regional boat ramp upgrades.

## A framework for allocation – how does allocation fit into fisheries management?

Fisheries are common property renewable resources. Modern Fisheries legislation addresses the challenges of managing the sustainable exploitation of these resources by multiple sectors seeking access to them (commercial, charter vessel, recreational and spearfishing, passive such as observational diving and tourism and conservation), targeting multiple species and using a wide diversity of gears types. The finite nature of fish stocks and the consequential need for constraints on the collective take results in legislation that, although reflecting some variation in approach between jurisdictions, fundamentally have primary objectives of:

1. Ensuring through proper conservation, preservation and fisheries management measures the resources are not endangered or over exploited; and
2. Provide an optimum utilization and equitable distribution of the available resources.

These objectives are pursued with both an inter-sectorial and intergenerational perspective.

The Objectives of the Queensland Fisheries Act 1994 (Division 2, Clause 3) are:

1. Provide for the use, conservation and enhancement of the community's fisheries resources and fish habitats in a way that seeks to –
2. Apply and balance the principles of ecologically sustainable development; and promote ecologically suitable development.

In balancing these principles, each is to be given the relative emphasis appropriate in the circumstance. It is suggested these can accommodate the current government's fisheries policy (subordinate to the Act) principle of "based on fisheries resources should be allocated to those who would provide the greatest economic value from their access". In doing so we need to be conscious of the requirement not to recommend arrangements that would be *ultra vires* of the Act.

It is acknowledged that, although highly fecund, fish stocks are vulnerable to overexploitation and ultimately collapse; either economically and/or biologically. A primary role of fisheries research is to underpin and inform (evidence based) management in addressing this through:

- identifying the key biological, life history (growth, natural mortality, fecundity, larval dispersal and productivity) and habitat/environment (eg substrate type, regional oceanography; and
- impacts such pollution and longer term climate change) characteristics of the stocks/species,
- the various sources and extent of fishing effort and fishing mortality;

to provide the inputs required to determine the key parameter of the Total Allowable Catch (TAC) from all sectors. This is complemented by integration with bio-economic fishery models, particularly with regard to the commercial sectors.

To enable the balance sought under the Act requires life history and stock assessment, stock utilisation and effort, economic value and return and social impact data by sector that are comparable to enable evidence based policy option and consequential allocation decisions.

The TAC determined by the researchers relates to all sectors. Management of the fisheries requires allocations of this TAC between the various sectors. In the commercial sectors this generally occurs

through Total Quota (TQ at sector/fishery/species level) and Individual Total Quota (ITQ at individual fisher/licence level). At the other end of the spectrum allocation to the passive/tourist sector can occur through the management tool of Marine Protected Area (MPA).

Any allocation requires agreed resource sharing principles, policies and processes. This two day workshop seeks to reach consensus on these, focusing on the multi-sectorial Queensland Coral Reef Finfish Fishery.

A resource allocation policy sets out a list of rules (as sometimes called **objectives** or **guiding principles**) that should be considered when allocation occurs. In addition to the key biological and stock assessment considerations outlined above, past experience across jurisdictions have identified a number of other factors that, when considered, may assist:

- Ensure understanding that in the case of the commercial sector an ITQ is not an absolute tonnage, but proportion (%) of the TAC at any time;
- Minimise secondary impacts: When undertaking an initial allocation seek to maintain the relativities (ie sector and individual proportion of catch the same after the allocation as before);
- Agree on a model that best delivers this (ie suggest based on historic catch over an agreed qualifying period rather than licence and entitlements held);
- If the initial allocation is “oversubscribed “ with regard to the available TAC it is preferable that all sectors and quota holders allocations be decreased proportionately to arrive at the TAC allocation;
- The implementation of an allocation regime must ensure comprehensive and adequate on-going catch monitoring, evaluation and reporting (MER) systems for all sectors are implemented to inform inevitable future management decision making (this may involve the need for either reductions or increases in the TAC depending on the success of the management measures, compliance and other impacts such as environmental both short and long term);
- The most effective modern fisheries management regimes involve the sectors, industries and individuals in the ongoing MER (preferably within the context of a real time management regime) and co-management of the stocks and habitats.

The over-arching principle is that with the right allocation policy, complemented by strong fisheries management, fish don't need to be fought over.



**This project will** focus on initially compiling a list of **OBJECTIVES** that should be considered in defining a resource allocation policy.

What objectives do we want to be considered when allocating coral trout between sectors?

Once we have compiled a list of objectives, the workshop will move towards identifying those data needs and tools required to facilitate allocation guided by those objectives.

To help thinking about useful objectives, it is worth asking: **How do other states handle resource allocation?**

South Australia, Western Australia and recently the Northern Territory have moved towards and/or adopted an explicit resource allocation process. In each of these cases, the objectives behind resource allocation are more numerous than maximizing economic value.

## **How other states “do” resource allocation: what are the OBJECTIVES considered important?**

In **South Australia**, the **objectives** for determining and adjusting allocation include:

**Optimum utilization:** best use of the resource for community at large

**Equitable distribution:** allocation distributes the benefits of use fairly among users

**Fishing to be fostered:** all sectors contribute social and economic benefit to the State, and are to be fostered for the benefit of the whole community

**Certainty for users:** respect for users, particularly for those who rely on it for their livelihood.

**Opportunity to be heard:** open public processes must occur (transparency and participation)

**Rights of existing users recognized:** initial allocation respects and considers current activities

**Compensation:** must be paid to the commercial sector if acquisition of licences/quota occurs

**Use best data and science:** management and allocation to occur using best available information

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In **Western Australia**, the **objectives** for determining and adjusting allocation include:

**Common property resource:** to be managed for the benefit of present and future generations.

**Sustainability** is paramount.

**Best available knowledge and data:** in an absence of this a precautionary approach should be heeded.

**Harvest level set at total mortality** of all sectors, and **allocation explicit** to commercial, recreational, customary and aquaculture.

**Total harvest should not exceed allowable harvest.**

**Management structures** are needed to manage take within each sector

**Allocation for optimum benefit** of the WA community including economic, social, cultural and environmental factors. Realistically, this will take time and is likely to be incremental over time.

**Remain open to government policy** to determine priority of use of fish resources where there is a clear case to do so.

**Management arrangements must provide sectors with opportunity** to access their allocation and not stifle it.

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In **the Northern Territory**, the following **objectives** will be applied in sharing the Territory fisheries resources

**Sustainability:** The on-going sustainability of the resource and the ecosystem on which it depends is paramount.

The biological condition, vulnerability and resilience of the fishery must be considered and managed in a precautionary way. The current condition of stocks will be used as the basis for future management.

**Customary Use:** Resource allocations will ensure the right of Aboriginals to use aquatic resources in a traditional manner is maintained.

**Stewardship:** Fisheries resources are a common property resource managed by the Government for the benefit of present and future generations. Every Territorian may access the NT aquatic resources in accordance with the applicable management rules. Territorians have a shared interest to ensure that aquatic resources are used in an ecologically sustainable manner.

**Information:** Decisions should be based on the best available ecological, cultural, economic and social information. Where information is limited, resource sharing decisions should be made on a risk management basis with the ecological sustainability of the resource as the primary objective.

**Transparency:** Relevant stakeholders shall be consulted and have adequate opportunity for involvement in the resource sharing process. This will include targeted consultation in regional communities. Outcomes should be made with full transparency and be subject to public consideration.

**Goal Orientation:** Outcomes must be focused on meeting the objectives set out in the Act.

**Strategic Development:** Resource sharing decisions should be justifiable, balance overall economic, social and cultural benefit to the Territory and provide for optimum utilisation of the resource.

**Social Performance:** Resource sharing decisions must seek to maximise the long term social benefits that are derivable from the resource, and in doing so give consideration to the full diversity of uses.

**Practicality:** Resource sharing decisions must be easy to understand and comply with and enforceable by law.

**Certainty:** Resource sharing decisions shall provide for stability and certainty in management arrangements for all sectors. Each sector will be allocated a proportional share of the resource.

**Structural Adjustment and cost contributions:** Where there is clear and demonstrable financial loss to a licensee as a result of a resource sharing decision, structural adjustment options for those licensees will be considered. Where possible, autonomous market based mechanisms are to be considered in the reallocation of the resource between or within sectors. The cost of reallocating a fishery resource as a result of a resource sharing decision should be shared.

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## Participants Homework:

Please discuss where you can and with whom you can what you believe should be the key **objectives** of resource sharing. Talk with other representatives from within your sector.

Think about your aspirations and expectations around fishing and coral trout.

Keep in mind that other sectors may have similar or different **objectives**. Indeed, individuals within the same sector may have different ideas about key guiding principles.

You can use the above examples for guidance, but do not need to be limited by these.

On the first morning of the workshop, each participant will be tasked with nominating their key objective(s) and describing why those objective(s) are important for them.





# Appendix 3 Workshop Agenda

Fisheries Research & Development Corporation Project 2013/230

Defining a resource sharing option in a multi-sectoral fishery: using the Queensland Coral Reef Finfish Fishery as a test case

## Workshop

Rydges Southbank Townsville,  
23 Palmer Street, South Townsville  
Thursday April 30<sup>th</sup> and  
Friday May 1<sup>st</sup> 2015.

### Day 1 – Thursday 30<sup>th</sup> April

Time	Activity	Who?
0900	Welcome tea, coffee, settle in	
0915	Formal welcome & housekeeping	Andrew Tobin and Rob Lewis
	Participant introductions (1 min each)	Participants
0940	Introducing the project (10 min each)	
	1. What is resource allocation	Rob Lewis
	2. Background to this project (previous workshop)	Andrew Tobin
	3. Management history	Andrew Thwaites / Darren Cameron
	4. Historical catches	John Kung / Jim Higgs
	5. Stock assessment, harvest control rules	John Kung / Andrew Thwaites
	6. Back to allocation (revisit project objective)	Re-visit where we are going
	7. Overview of the Governments Sustainable Fishing Policy	Andrew Thwaites
1045	Coffee break	Coffee break

1100	The process of (framework for) resource allocation	Rob Lewis
1110	Who are the sectors that want a slice of the pie?	Andrew Tobin
1110	What are the <u>objectives</u> of resource allocation	Rob Lewis / Andrew Tobin
	Individual by individual and sector by sector	
	Explore <u>objectives</u> of allocation	
1230	Lunch	Lunch
1330	Re-visit the objectives	Rob Lewis / Andrew Tobin
	Individual discussion about what objectives are most important	
	Short list to 10 – 12 objectives and evaluate against sector	
1430	Review objectives discussion – what do we do with these? Are some non-negotiable?	Rob Lewis
1440	Afternoon tea	Afternoon tea
1500	Building an allocation option	Rob Lewis / Andrew Tobin
	Define the objectives	
	Identify data + tools to meet those objectives	
1645	Wrap the day	Rob Lewis
	Summary of where we are, where we need to go, what to ponder o/night.	

## Day 2 – Friday 1<sup>st</sup> May

Time	Activity	Who?
0845	Welcome tea, coffee, settle in	

0900	Let's get on with it ..... review day 1	Rob Lewis
	Review our option Review our objectives Have discussions, thoughts o/night changed your perspectives?	
0915	Hypothetical testing of our option	Rob Lewis
	Stakeholders invited to challenge the option with scenarios	
1015	Coffee break	Coffee break
1030	Review input and output controls	Rob Lewis
1230	Lunch	Lunch
1330	Re-visit and review	Rob Lewis /Andrew Tobin
1400	Where to from here – reporting to the Minister	Rob Lewis /Andrew Tobin
1430	Wrap it up	Rob Lewis

# Appendix 4 The Australian Labour Parties Election Policy

The Australian Labour Party released this policy less than 48 hours before the January 2015 election.



**SUSTAINABLE**

**FISHING**

Labor's plan for fishing in Queensland

## Appendix 5 Individual scoring of cumulative list of objectives

	Rec 1	Rec 2	Rec 3	Rec 4	Com 1	Com 2	Com 3	Com 4	Com 5	Charter	T Owner	QDAF	QDAF	Cons 1	Cons 2	Cons 3	Research	Research	Research	Research	Research
Sustainability/conservation	2	5	10	2	10	4	5	10		6	3	4	5	10	3	10	1	3	10	10	3
Best data & science	2	5				5			4	6	2	3	4		3		3	3	3		3
Allocation for optimum benefit		5	1		5	2	2		2		2	1	1	3	1	2	3	5			2
Transparent and consultative	2	5			1	1	2	3			3	1	1	2	2			3	2	5	2
Global TAC			2				2		8			1	1		2	4	3		3		3
Adaptive management	2		2			3			2			1	1	5	1	2	2	3		2.	1
Certainty & stability	1			4	1	1	3			5		3					1	3			
Common property recognition	2						3				3		5		3						3
Practicality & simplicity	1			10				2				1	1		1						
Strong compliance					2			5				1			1	2	1				
Equitable distribution	3										2		1		1					2.	2
Manage for profitability				2		2	3					1			1		2				
Sector specific management	4									3		1			1		1				
Fund compensation as needed				2		2			4			1									1
Respect customary use											3	1					3		2		
Maximise social benefit	1		5		1						2										