

Sustainable Fisheries Strategy

2017–2027

Discussion paper

Reform of the Queensland crab (mud and blue swimmer) fishery

Why is reform needed?

The Queensland Government released the *Sustainable Fisheries Strategy 2017 - 2027* (the strategy) in June 2017, paving the way for Queensland to have a world-class fisheries management system. The strategy recognises Queensland's current fisheries management system is cumbersome, costly to administer, inflexible and increasingly ineffective at ensuring sustainability of our fisheries. It is not keeping up with community expectations, supporting viability of Queensland's commercial fisheries or modern fisheries management practices.

A key action is to implement harvest strategies for all fisheries by 2020, with a priority on the east coast inshore, trawl and crab fisheries. A harvest strategy is a framework that specifies pre-determined management actions for a defined species necessary to achieve the agreed ecological, economic and/or social objectives (e.g. how much commercial quota and recreational bag limits should go up or down depending on the biomass of the fish stock).

For more information on Queensland's approach to harvest strategies, see daf.qld.gov.au/business-priorities/fisheries/sustainable-fisheries-strategy/harvest-strategy

Queensland's crab fishery is an iconic fishery for commercial, recreational and traditional fishers. There are a number of crab species caught in Queensland which are highly sought after by Queenslanders, tourists and international markets. A sustainable crab fishery is important to maintaining a healthy and resilient Great Barrier Reef.

This discussion paper will focus on mud crab and blue swimmer crabs only. The spanner crab and red spot crab fisheries will develop harvest strategies through separate processes.

There is clear evidence that the current management arrangements, which have been in place and remained largely unchanged for the last 30 years, are no longer effective. Stakeholders regularly identify concerns around localised depletion and excess effort in the mud crab and blue swimmer crab fisheries.



Positives for the fishery

- protection of female crabs and size limits protect sustainability of stock
- high value fishery - iconic Queensland species.



Issues

- overcapacity and high competition
- significant pressure on adult male crabs
- take of 'C grade' crabs - not maximising economic returns
- black marketing (particularly mud crab)
- no recreational limit on blue swimmer crab
- protected species impacts from gear (active and abandoned pots).

Low catch rates are impacting the profitability of the commercial sector, and the satisfaction of the recreational sector throughout Queensland.

The mud crab fishery is one of the most valuable commercial fisheries in Queensland with the product attracting up to \$87/kg at peak periods of the year and a total gross value of product of \$15.9 million. The high price of mud crab has led to widespread black marketing (illegal sales) by all sectors which undermines the sustainability of mud crab stocks and economic viability of the commercial fishery.

Broader social concerns from the recreational sector mirror those facing the commercial sector. Fishers are concerned over competition for access, particularly around larger population centres. The high competition between and within fishing sectors for the resource has resulted in social conflicts including; verbal and physical altercations, interference with crab pots, a high rate of crab pot theft and pot raiding. Competition for the resource has also led to an increase in the number of commercial operators landing lower value 'C grade' mud crabs.

There is concern over the interactions of the crab fishery with non-target species, including threatened, endangered and protected (TEP) species that can get entangled in crab pot gear, particularly from abandoned or lost equipment.

The fishery is currently managed through a combination of input and output controls, however, this system is difficult to enforce and provides no effective mechanism that is capable of constraining the catch or effort of any sector. As a result, the fishery does not have the fundamental management structure in place to allow for a harvest strategy that responds to changes in stock abundance or other circumstances. The protection of female crabs and minimum size limits are the primary tools preventing overfishing, but there is extreme pressure on the remainder of the available stock.

Community support and confidence in the management of this fishery is required to ensure ongoing access to fisheries resources by all sectors. More accurate data is needed to build confidence and understand the impact of current harvesting levels. It is also important to set a clear vision for the future of this fishery to more effectively and sustainably manage the catch of all fishers and reduce conflict between stakeholders.

About the Queensland crab fishery

The Queensland crab fishery includes commercial, recreational, traditional and charter fishing, and targets mud crabs and blue swimmer crabs. Queensland's crab fisheries operate throughout the state's coastal waters, including the Gulf of Carpentaria. The main apparatus used by all fishers to catch mud crabs and blue swimmer crabs are wire-mesh crab pots, trawl-mesh (nylon) crab pots and collapsible traps. Because of the ease of access to this fishery there is a high level of use by all sectors.

Mud crab

Queensland's mud crab fishery is characterised by both intense effort and high catches, with the harvest of mud crabs totalling more than other Australian mud crab fisheries combined (Northern Territory, Western Australian, and New South Wales).

However, the commercial catch has declined in recent years with catches falling from around 1419 tonnes in 2011 to around 987 tonnes in 2016, while effort has remained high (43,000 fishing days per year). Importantly, from 2011 to 2016 the commercial catch-per-unit-effort (CPUE) has reduced from 33 kg/day to a low of 23 kg/day. Many commercial fishers state these catch rates are no longer economically viable.

Despite declining catch and high effort, the Status of Australian fish stocks (SAFS) classifies both east coast and Gulf of Carpentaria mud crab stocks as sustainable.

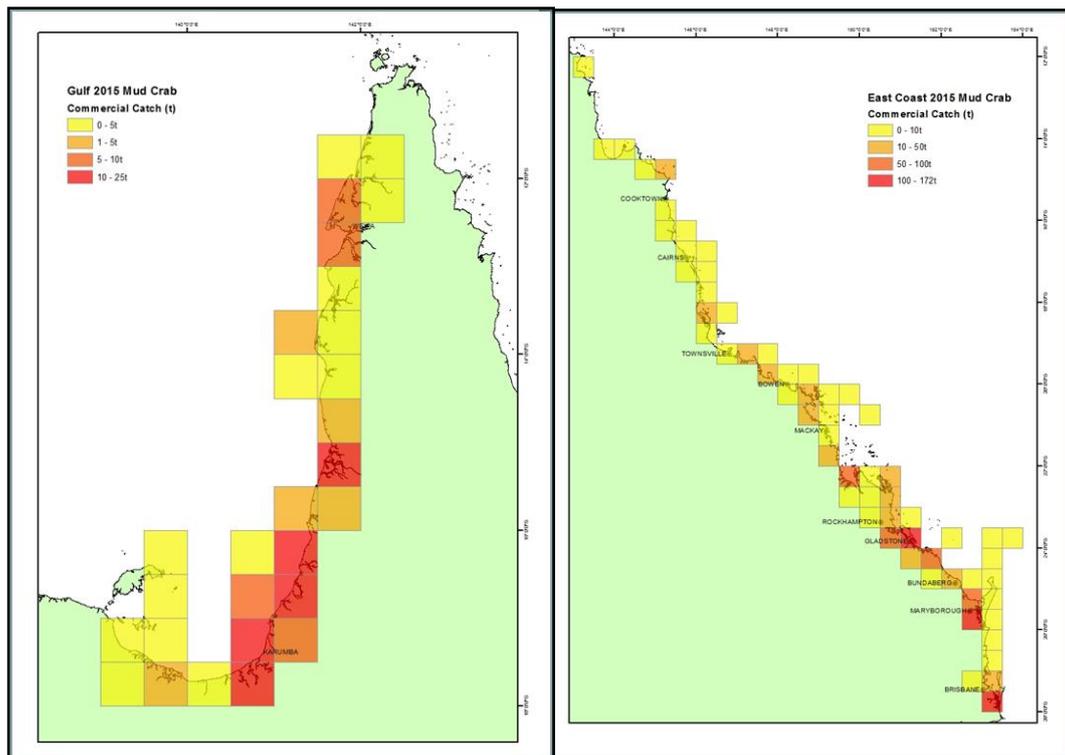


Figure 1: Distribution of commercial mud crab catch east coast of Queensland and Gulf of Carpentaria in 2016. Note the different map scales – 25 tonnes maximum catch in Gulf and 172 tonnes maximum catch on the east coast.

The reported mud crab catch from the Gulf of Carpentaria has nearly halved between 2011 (184 tonnes) and 2016 (100 tonnes). During this period, the reported CPUE has also declined from 32 kg/day (2011) to 24 kg/day (2016). The reduced catch of mud crab in the Gulf of Carpentaria has been linked to low recruitment from environmental factors, such as a lack of significant rainfall during recent wet seasons.

The recreational sector has been experiencing a similar magnitude of declines to the commercial sector. In 2013, more than 642 000 people fished recreationally in Queensland. Of the 11.56 million fish taken, around 1.7 million were mud crabs, with 80% of the catch released back into the water. Estimates of recreational crab harvest has halved from 661 tonnes to 339 tonnes between 2000 and 2013. Based on the most recent recreational harvest estimate for mud crabs in Queensland the vast majority of catch was attributed to the east coast (332 tonnes). As part of Queensland’s boat ramp survey program, 5492 people were interviewed in 2017, with 95% of recreational fishers not catching the current possession limit of 10 crabs. This raises the question whether the current recreational limits are relevant or effective, or whether satisfaction could be improved through increasing recreational catch rates.

The take of mud crabs in Queensland by Indigenous fishers is largely unknown, but previous estimates suggest it to be less than 20 tonnes per year.

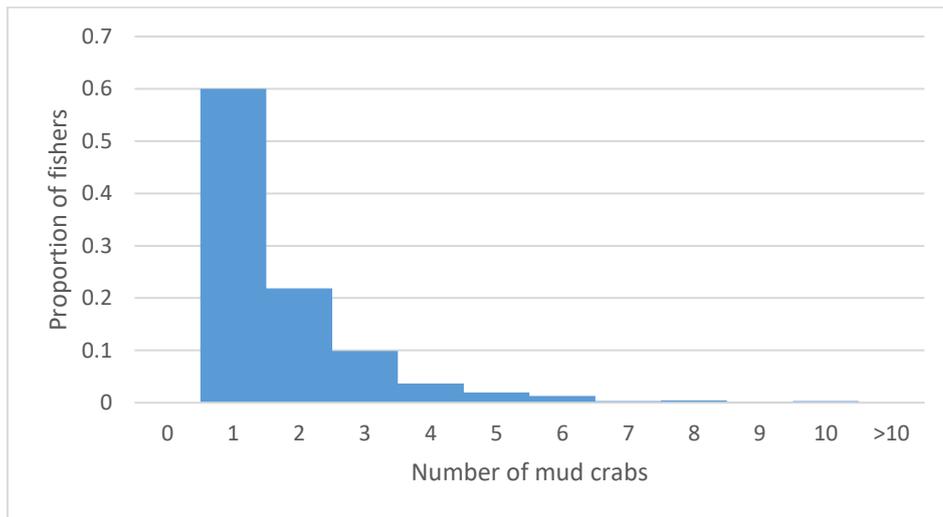


Figure 2: The proportion of mud crabs kept per person from the recreational boat ramp survey during interviews conducted during 2017. The graph indicates that over 90% of fishers interviewed kept 3 crabs or less.

Blue Swimmer Crab

Since 2011, commercial blue swimmer crab harvest has been variable. The most recent stock assessment noted that significant reductions in fishing effort are required to ensure sustainable stocks and promote an optimum economic yield.

The total commercial catch of blue swimmer crabs in recent years has been around a quarter of that which was harvested in the past. Harvest has been 350 - 400 tonnes in recent years, down from historical harvest levels of around 1300 tonnes in 2003 and 2004.

Blue swimmer crabs are harvested in Queensland's east coast trawl fishery as a permitted by-product species. The take by trawl is variable, averaging around 50 tonnes per year over the last decade. This was considerably higher prior to 2004, when catches exceeded 100 tonnes in most years.

There is high localised pressure on blue swimmer crabs in Moreton Bay, Sunshine Coast and Hervey Bay from commercial and recreational fishers. These regions account for around 95% of the reported commercial pot harvest. These areas have high population densities and are hot spots for recreational crabbing. The take of blue swimmer crabs by the recreational sector has been estimated to be around 33 tonnes per year, although this is likely to be well below actual recreational harvest levels, as there is no possession limit and effort is unrestricted. As part of the boat ramp survey program, 988 people who kept blue swimmer crab were interviewed in 2017, with 90% of recreational fishers catching six crabs or less.

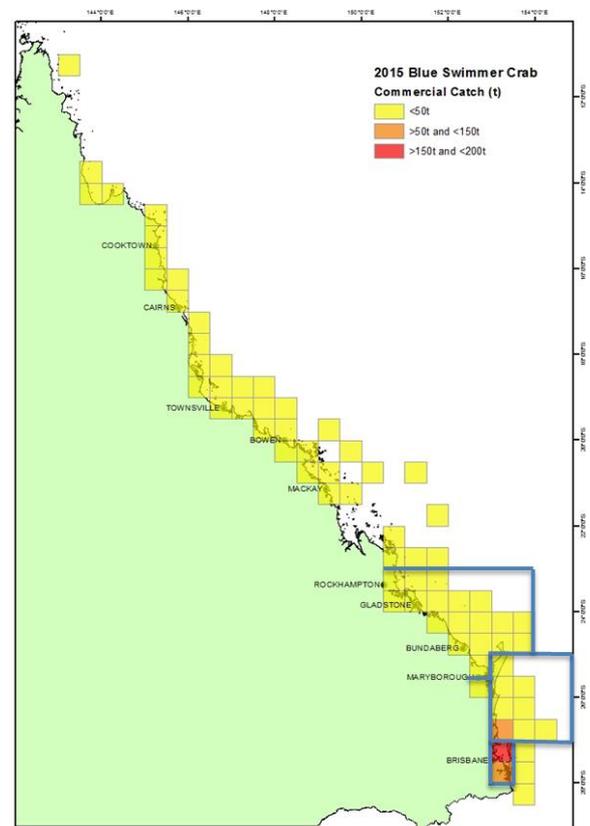


Figure 3: Distribution of commercial catch distribution throughout Queensland 1999 - 2016

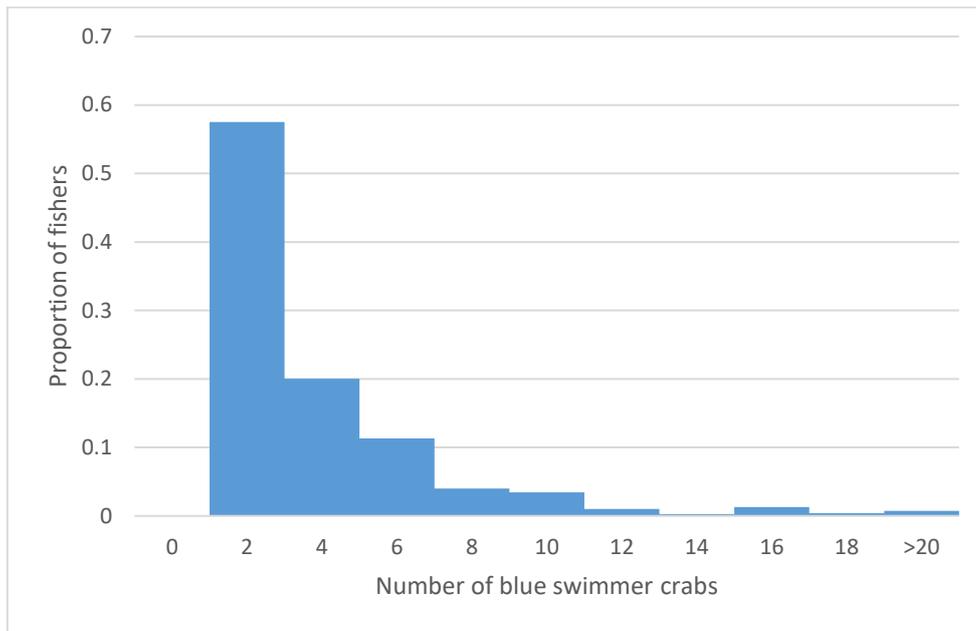


Figure 4: demonstrates the proportion of blue swimmer crabs kept per person from the recreational Boat Ramp Survey program during interviews conducted between 1 January 2017 and 31 December 2017.

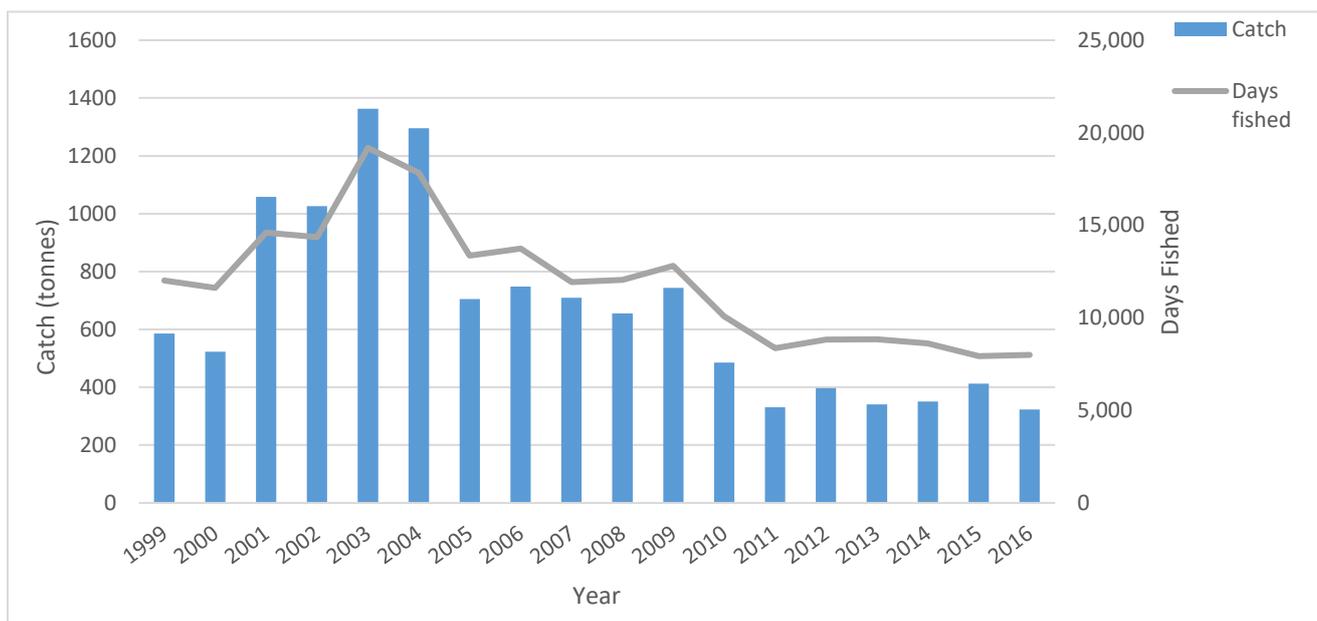


Figure 5: commercial catch and effort (pot) for blue swimmer crab in all Queensland waters from 1999 - 2016

Draft fishery objectives – where we want the fishery to be

Fishery objectives are designed to set out the direction and aspirations for a fishery. Effective harvest strategies rely on ecological, social and economic objectives that have been set in consultation with stakeholders to determine what the harvest strategy is trying to achieve. While each fishery is different, the strategy and the *Fisheries Act 1994* specify certain policy objectives and targets that must be achieved. Ecological objectives will have priority over socio-economic objectives. The draft fishery objectives have been developed with advice from the crab working group.

Ecological objectives	Social and economic objectives	Management objectives
<ul style="list-style-type: none"> • Achieve Sustainable Fisheries Strategy biomass objectives for crab stocks • Understand fishery interactions and impacts on bycatch, threatened, endangered and protected (TEP) species • Demonstrate there is no unacceptable risk to bycatch, TEP species and the ecosystem. 	<ul style="list-style-type: none"> • Maximise commercial economic benefits for all sectors • Maximise value of the commercial product (i.e. mud and blue swimmer crab) • Increase recreational fishing satisfaction • Improve social benefits of the fishery to the community • Reduce competition and conflict within and between sectors • Maintain Aboriginal peoples and Torres Strait Islanders access for traditional fishing. 	<ul style="list-style-type: none"> • Ensure fisheries management is meeting the expectation of the sectors and community • Improve data and undertake more regular stock assessments to inform management decisions • Manage excess capacity to improve socio-economic benefits and minimise the risk of overfishing.

Ecological objectives

Achieve Sustainable Fisheries Strategy biomass objectives for crab stocks

This objective is identified in the strategy to achieve specific biomass targets for stocks. The aim is to achieve at least 40-50% of the original unfished biomass by 2020 and 60% by 2027. The specific targets for each key species will be outlined in the operational components of the harvest strategy. While biomass estimates can be obtained for many species, direct estimates of biomass may be more difficult for many other species and proxies, such as catch rates may need to be used. It is recognised that crabs are linked to environmental drivers like river flow and this needs to be taken into account.

Understand fishery interactions and impacts on bycatch, threatened, endangered and protected (TEP) species

This objective recognises that continuous improvement is required to better understand fishing interactions with bycatch and TEP species like turtles. A key information source will be environmental risk assessments, a commitment under the strategy, which will identify fishing risks that require further management. This objective is necessary to provide community confidence that fishing is a low risk. It also addresses the *Environment Protection and Biodiversity Conservation Act 1999* and current Wildlife Trade Operation conditions for improved reporting and data validation.

A key component is the need for validating relevant data and information (catch logbooks, species of conservation interest logbooks) to demonstrate there are no unacceptable risks to bycatch, TEP species and the ecosystem from fishing. The implementation of vessel tracking, a data validation plan and investigation of novel technologies (e.g. cameras / digital observers / citizen science / apps) under the strategy will be critical to achieving this objective.

Demonstrate there is no unacceptable risk to bycatch, TEP species and the ecosystem

The fishery interacts with bycatch and TEP species which must be actively managed within community expectations to ensure fishing doesn't threaten population viability. It will be important to demonstrate there is no unacceptable risks associated with the harvest of mud crabs.

Socio-economic objectives

Maximise commercial economic benefits for all sectors

Commercial, recreational and charter fisheries are economically important, particularly in regional communities where other employment opportunities may be limited. Maximising fishing economic benefits is linked to the target to build fish stocks to around 60% of the original unfished biomass by 2027. A higher biomass not only supports resilience, it also supports optimal fishing efficiency. The intent being that all fishers will get a better rate of return for their effort that is only possible when a larger biomass of fish is available.

There should also be sufficient return on investment to encourage commercial fishers to improve their operations and innovate. Ensuring flexibility so fishers can respond to the availability of fish at different times, environmental conditions and market issues is important in supporting the return on investment and viability of the fishery and support businesses (e.g. seafood wholesalers and retailers, fishing equipment, freight and ice suppliers).

The recreational sector also supports regional economies and onshore businesses such as tackle, boating shops and hire services. Where fishers travel to locations to fish there are also benefits to accommodation and food supply businesses. Fishers (and non-fishers accompanying them) are also likely to support other tourism businesses.

The commercial benefits from charter fishing businesses are similar to those of the recreational sector. Charter fishing also creates additional small businesses which themselves use a diverse range of local services (e.g. accounting, banking, and repair).

Consideration should also be given to providing indigenous communities economic development opportunities from fishing, which in some communities is one of the few options available to them.

Maximise value of the commercial product (i.e. mud and blue swimmer crab)

This objective is intended to encourage and support the landing of catch when it is most valuable, by ensuring it is caught at the best size for market preferences and in the best condition. A clean, green, sustainable image of the fishery will also promote higher value. It is also acknowledged that the market needs a continuity of supply and critical mass of fishers to sustain output and increase value. For the mud crab fishery, this could also help address the prevalence of operators taking and selling 'C grade' crab.

Increase certainty and security of access for commercial fishers

Many commercial fishers find it difficult to invest in their fishery for the long term because of uncertainty in management. Having clear operating conditions and security of access will allow fishers to increase their stewardship of the resource.

Increase recreational fishing satisfaction

The Strategy has a clear target to increase the satisfaction of recreational fishers, including those who fish recreationally with charter operators. Satisfaction may range from just being on the water, to being able to catch a quality fish, to being able to feed their family.

Charter fishing operators also benefit commercially from satisfied customers who are more likely to provide a return business and recommend the experience to others.

Improve social benefits of the fishery to the community

This objective aims to recognise the flow-on effects and benefits for regional communities from fishing. These include direct employment as well as a range of support services that might otherwise cease to exist

if fishing were not present. This is particularly important in regional areas where many diversified small businesses rely on income generated by fishers during quieter times of the year.

Reduce competition and conflict within and between sectors

Reducing competition and conflict within sectors allows for more efficient fishing practices, which would be further enhanced with management options preventing a race to fish and localised depletion. There is often conflict between sectors (e.g. recreational and commercial) over how the resource is shared and accessed. Mechanisms to reduce this conflict and recognise the importance of each of the sectors will be needed.

Maintain Aboriginal peoples and Torres Strait Islanders' access for traditional fishing

Access to traditional fishing is important to many Indigenous fishers as a way of remaining connected to culture and providing a source of food. The purpose of this objective is to ensure that Aboriginal peoples and Torres Strait Islanders' access to fisheries resources is recognised in Queensland and Indigenous communities are involved in the sustainable management of fisheries.

Management objectives

Ensure fisheries management is meeting the expectation of the sectors and community

The community want to have confidence in the management of the fishery. This includes appropriate monitoring, stakeholder engagement, compliance and responsive management. The community also expects that government agencies will work together on shared issues like ecosystem health, which is critical to productive fisheries.

Improve data to inform management decisions and undertake assessments

This objective is identified in the strategy and is intended to improve the accuracy, reliability and timeliness of data and stock assessments to support sustainable fisheries management. The Monitoring and research plan will be critical to achieving this objective.

Manage excess capacity to improve socio-economic benefits and minimise the risk of overfishing

This objective recognises that from time to time excess capacity within a fishery will have adverse impacts on sustainability as well as achieving the socio-economic objectives for the fishery. To achieve this objective the catch of all sectors must be set based on sustainable limits.

Matters to consider

Do you agree with the proposed fishery objectives?

Would you recommend any changes? If yes, what and why?

Splitting the fishery up – proposed management units

The Strategy requires fisheries be divided into management units that allow for management arrangements to be applied at the appropriate scale. A management unit may be the target species, biological stock boundaries, a geographical boundary related to the fishery, gear or combination of these. The strategy states the preference is to manage to the stock level. Setting the management units to the appropriate scale is important to ensure future management actions are responsive (e.g. being able to adjust quota or effort units in one region up or down rather than the entire state). The management unit will become the scale at which harvest strategies are set up and the fishery is structured (e.g. if the fishery moves to quota or effort units, these would be allocated to each of the regions and adjusted up and down with the stock). This avoids blunt management changes like closing the entire fishery if there is concerns about a particular species in a particular area.

The draft management units for this fishery are based on input from crab working group (Table 1). They were arrived at by looking at the genetic stock boundaries and available science for crabs. Consideration was also given to further dividing the mud crab management unit on the east coast, however, given there is very little catch of mud crab north of Cooktown a separate management unit for that genetic stock was not considered necessary.

Some fishers have suggested there should be finer scale management units on the east coast for mud crab to more effectively manage concerns around localised depletion and conflict within and between sectors. This is a complex issue as finer scale management may overly restrict flexibility and consequently the economic viability for commercial fishers. Consideration could be given down the track to splitting off Moreton Bay as a separate management unit, depending on the recommendations from the trial of regional management which is being piloted in Moreton Bay.

A map is at **Attachment 1** displaying the possible boundaries.

Table 1: Proposed management units for the Queensland crab fishery.

Proposed management unit	Map No.	Possible boundary	Species covered
Mud crab Gulf of Carpentaria "GC1"	1	Gulf of Carpentaria tidal waters of waterways that flow to the sea west of longitude 142°31'49" east to the Northern Territory border and south of latitude 10°41' south.	Mud crab
Mud crab east coast "EC1"	2	East coast, tidal waters of waterways that flow to the sea east of longitude 142°31'49" east, to the New South Wales border and south of latitude 10°48' south.	Mud crab
Blue swimmer crab "BC1"	3	All Queensland waters.	Blue swimmer crab

The catch and effort data for each of the proposed management units is presented in **Table 2**. There is a high number of commercial fishers actively fishing the east coast mud crab fishery with a number of these commercial fishers also accessing the blue swimmer fishery.

Table 2: Indicative catch and effort in the proposed Queensland crab fishery management units (some fishers may be currently fishing in more than one fishery management unit)

Proposed management unit		Effort (number of licences reporting catch)	Effort (total days where catch reported)	Total reported commercial catch
Blue swimmer crab	Pot	110	8222	360 tonnes
	Trawl (T1)*	209	8116	50 tonnes
Mud crab east coast		242	38 245	1040 tonnes
Mud crab Gulf of Carpentaria		44	4676	125 tonnes

* Estimated catch of blue swimmer crabs from the trawl sector (T1)

Currently, a C1 symbol allows a commercial fisher to fish anywhere in Queensland for either blue swimmer or mud crabs. In order to operationalise the draft management units, all existing C1 symbol would need to be converted or allocated into one of the new three management units. Holders of multiple C1 endorsements may choose multiple management units, or keep them both in the same management unit.

Based on a review of logbook catch and effort data for the last three years (2014-2016) a possible outcome, if fishers elected to remain in the part of the fishery they have been active in, is as follows:

Table 3: Estimate of the number of commercial C1's symbols currently active in each draft management unit. Numbers do not reflect individual fishers or licence numbers, as some fishers have more than one C1 symbol (indicative purposes only).

C1 = 411		
Blue swimmer crab	Mud crab	
All Queensland "BS" symbol	East coast "ME" symbol	Gulf of Carpentaria "MG" symbol
60	291	60

Matters to consider

Do you agree with the draft management units?

Do you think there is a better way to split the fishery up? If yes, how?

What requirements should be in place to nominate a management unit? Voluntary nomination or fishing history in the region?

Draft management options

Many of our fisheries do not have the right management structure in place to allow for a harvest strategy that responds to changes in stock abundance or other circumstances. Collectively, the fishery objectives, management units and management options will set up the fishery for a harvest strategy. The strategy clearly states the preference is to move to output controls, like quota, wherever possible.

Splitting the fishery into the proposed management units goes some way towards achieving these goals, however further management reform is required. It is possible for each of the management units to have different management options applied, for example blue swimmer crab can be managed differently to east coast mud crab. The following options have been developed with input from the crab working group. The working group considered a competitive total allowable commercial catch option, however they considered it was not suitable in the crab fishery as it would encourage a 'race to fish' scenario. Options that would not achieve the objectives of the strategy, for example do nothing, have not been included.

Option 1: Individual transferable quotas (ITQs)

Total allowable commercial catches (TACCs) would be set in each management unit. TACCs could be established using existing catch levels. Individual transferable quota units (ITQs) would then be allocated to individual commercial fishers. This could be done using catch history or other mechanisms (see next section).

Pros	Cons	Matters to consider
<ul style="list-style-type: none"> - greater certainty for commercial fishers - less risk of race to fish - promote better resource stewardship and may reduce the amount of 'C grade' crab being landed - can adjust the total allowable catch up and down by adjusting the value of a quota unit - fishers would be able to increase or decrease their quota holdings to suit their business needs - fishers would be able to utilise their ITQ holdings at times when market conditions are most profitable - no issues with latent effort - commercial fishing app could be used in future to transfer quota and report catches. 	<ul style="list-style-type: none"> - difficulty in quota allocation process - potential for consolidation of quota - costs of management are potentially higher - determining the TAC where there is no formal biomass or stock assessment can be difficult. 	<p>Do you support this option?</p> <p>Is this suitable for all three management units?</p> <p>How would you address flexibility concerns?</p> <p>How would you allocate quota, especially where there are concerns about the accuracy of logbook data?</p> <p>How should this option be funded?</p>

Option 2: Individual transferable effort units (ITEs) for commercial fishers

A Total allowable effort (TAE) would be set for the whole fishery (e.g. days fished) with individual transferable effort units (ITEs) allocated to fishers based on the management units. This would be similar to how the trawl fishery is managed.

Pros	Cons	Matters to consider
<ul style="list-style-type: none"> - reduces effort and amount of time that pots are in water so could help reduce risks of interactions with protected species - use vessel tracking to deduct effort units - can adjust the Total allowable effort up and down. 	<ul style="list-style-type: none"> - requires more input controls than other options to sustainably manage the fishery - not constraining the catch itself - difficult to allocate effort units as there is no historical vessel tracking data - more complex monitoring and validation required - a 'day' effort unit is probably too coarse and may require finer scale measure in the future. 	<p>Is individual transferable effort units using fishing days as the effort unit an option worth considering?</p>

Option 3: Tagging mud crabs

Introduce authentication tagging of crabs to easily identify illegal trade and sale of crabs as well as establishing their origin and help control the catch. Tagging could be applied to all sectors or to specific sectors.

The Northern Territory (NT) Government recently introduced authentication tagging of Black Jewfish swim bladders in response to black marketing issues, a case study of the NT program is provided as **Attachment 2**.

Pros	Cons	Matters to consider
<ul style="list-style-type: none"> - tagging arrangements would help to reduce black marketing could be used as means of ensuring compliance with a quota system - economic gains to the commercial industry by improved marketing opportunities associated with establishing crab origin. 	<ul style="list-style-type: none"> - Additional costs establishing a tagging system and providing tags - recreational fishers may not have the ability to handle crabs with enough proficiency to tag a crab. 	<p>Do you support commercially caught mud crab tagging throughout the State?</p> <p>Is recreational tagging of mud crabs feasible?</p> <p>How should this option be funded?</p>

Option 4: Symbol amalgamation

Symbol amalgamation would deal with excess capacity concerns by reducing the number of commercial fishers in a management unit by combining the number of entitlements required before fishing can occur. Options may include:

- Establishing a minimum holding requirement (e.g. two entitlements could be required to fish in a management unit - this would result in a 50% reduction in excess capacity)
- Tailored unitisation (unrelated to pot numbers) is another option if a 50% reduction in the fishery is not required. This option can be implemented after the management units are in place followed by an adjustment of unit values, for example:

Based on 411 C1 symbols:

- 1 x C1 = 5 units. Require 10 units to fish (50% reduction in C1 symbols)
- 1 x C1 = 9 units to fish (44% reduction in C1 symbols)
- 1 x C1 = 8 units to fish (37.5% reduction in C1 symbols)
- 1 x C1 = 7 units to fish (29% reduction in C1 symbols)
- 1 x C1 = 6 units to fish (17% reduction in C1 symbols)
- 1 x C1 = 5 units to fish require 5 units to fish (status quo)

Pros	Cons	Matters to consider
<ul style="list-style-type: none"> - does not need to be applied to all management units, only where required to address excess capacity - reducing the number of commercial fishers would help reduce competition and minimise conflict in the fishery - profitability of remaining participants would increase 	<ul style="list-style-type: none"> - those fishers who wish to remain in the industry will have to buy those wishing to exit out - may temporarily drive up the price of crab fishery licences while the adjustment is taking place 	<p>Would it be desirable to reduce the number of fishers in the crab fishery? If so, which crab sector? (BS, ME, MG)</p> <p>What is the desirable number of licences that could be sustained in each crab sector?</p> <p>Do you support this option of amalgamating symbols?</p>

<ul style="list-style-type: none"> - there would be a market for fishers wishing to exit the industry sell their endorsements to those who wish to continue in the fishery - catch rates may improve over time with less participants in the fishery. 	<ul style="list-style-type: none"> - doesn't actually constrain the catch or effort - while there are less fishers, crab harvest still may exceed what is considered sustainable. 	
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Option 5: Pot unitisation

This option would reduce the number of pots permitted per commercial licence to reduce competition. Under this option, each C1 symbol would be allocated 5 pot units allowing them the use of 10 pots initially. This option could be implemented after the management units are in place followed by an adjustment of pot units, when to reduce pot numbers, for example:

- 1 unit equals 9 pots or 45 pots in total
- 1 unit equals 8 pots or 40 pots in total
- 1 unit equals 7 pots or 35 pots in total

Pros	Cons	Matters to consider
<ul style="list-style-type: none"> - pot unitisation may reduce the number of pots permitted to be used in the commercial fishery. 	<ul style="list-style-type: none"> - unclear whether this will effectively cap catch or effort - significant challenges with monitoring compliance with crab pot numbers 	Is pot unitisation an option worth considering?

Option 6: Review recreational possession and pot limits and adjust possession limits in line with a harvest strategy.

This option would include reviewing current possession and gear limits to deter black marketing, ensure all crab stocks have possession limits and ensure that the rules are simple. For the crab fishery consideration may be given to introducing:

- possession limit for blue swimmer crab as it currently doesn't have one
- a total boat possession limit for all crab to better manage recreational catch and reduce the potential for black marketing
- reducing the existing mud crab recreational limit
- a total boat crab pot apparatus limit.

As part of this, possession and pot limits would be compared and contrasted with adjacent jurisdictional limits.

Consideration could also be given to the setting of total allowable recreational catch for key species to meet biomass targets. Combined with commercial total allowable catch this could provide a mechanism to control the *total* catch from all sectors. Changes to possession limits for individual species would be adjusted over time (up or down) as part of harvest strategies to keep catch within the total allowable recreational catch limit, but only after any triggers and rates of adjustment are approved through the harvest strategy process. For example, if the biomass of a species declined and hit a trigger, the bag limit (and commercial effort or quota) would be reduced to a pre-determined level to help the stock recover. If

biomass increased above a target the opposite would occur (i.e. increase total allowable commercial and recreational catch and associated quota/bag limits etc).

Pros	Cons	Matters to consider
<ul style="list-style-type: none"> - recreational possession limits are the main way to control recreational catch - opportunity to ensure recreational take can be controlled within sustainable limits (particularly for blue swimmer crab where there is no possession limit) - would help address black marketing of crabs in Queensland. 	<ul style="list-style-type: none"> - recreational limits do not effectively cap the level of harvest. Boat ramp survey program interviews in 2017 indicate 95% of fishers are not catching the current possession limit for mud crab - recreational catch data gaps mean the link between possession limits and annual catch is difficult to quantify - there is a wide range of views about what represents fair possession limits. 	<p>Do you support a reduction in the recreational possession limit of mud crab? What should it be?</p> <p>Do you support the introduction of a possession limit for blue swimmer crab? If so, what should it be?</p> <p>If an overall recreational boat limit for crab was introduced, what should it be?</p> <p>Should there be any changes to the pot restrictions for recreational fishers?</p>

Option 7: Review blue swimmer crab caught by the trawl sector

This option would review how the current take of blue swimmer crab by the trawl sector would fit into the pot fishery harvest strategy.

Pros	Cons	Matters to consider
<ul style="list-style-type: none"> - a review of rules that leads to a reduction of take by the trawl sector may allow more crabs to be caught in the pot fishery. 	<ul style="list-style-type: none"> - a reduction of take could result in a high level of discarding by trawl which is counterproductive. - potential loss of economic value to the trawl fishery. 	<p>Do you think there should be a review of the catch of blue swimmer crab by the trawl sector?</p>

Allocation method options

When introducing catch or effort-based quota management to a fishery, allocation is usually one of the most contentious issues facing managers and industry. This is because it is about ‘who gets what’.

Historically, initial allocations in Queensland and other Australian jurisdictions have relied on administrative methods based on catch history. Through experience, we have learnt catch history methods are resource intensive (requiring decision makers, catch history verification), lengthy (due to opportunities for formal appeal) and problematic (as fishers have doubted the integrity of the catch history used).

In considering management options it is also important to consider all allocation methods. The following allocation methods are commonly used by fisheries managers both in Australian and internationally:

- equal allocation
- historical catch
- auctions
- nominating which regions
- mixed models

The crab working group felt that if quota or effort units are established then

- catch history should be used to allocate
- investment warnings needed to be taken into consideration
- lessons should be learned from past processes.

In this circumstance, information other than just logbook information would be needed to validate data (e.g. tax records, receipts etc.). This could be blended with nominating which management units fishers want quota or effort units in, or nominating which years catch history they would prefer to use (e.g. choose three preferred years from last 10).

Matters to consider

Which allocation option do you prefer?

Are there other allocation options that could be considered?

Allocation requires confidence in the data being used. What options for data validation do you recommend? For example, if we are going to use catch history, how should we validate that information – receipts, tax records?

Some people are concerned about consolidation of quota. If we move to quota or effort units should holdings by individuals or companies be restricted in some way (e.g. to people with a symbol or maximum holdings)? If yes, why.

Next steps

While there have been initial discussions on management and allocation method options for the priority fisheries, no decisions have been made. This discussion paper is the basis for the initial round of engagement on the management of the Queensland crab fishery.

The feedback from this discussion paper will be provided to the working group to provide advice on a preferred management option and develop a draft implementation plan, including allocation, for review by the Sustainable fisheries expert panel in July 2018. The Expert panel communicate is made available online to all stakeholders and will outline the result of their review.

If the preferred management option and draft implementation plan is endorsed by the expert panel, the working group will commence work on the harvest strategy.

There will be plenty of opportunity for you to provide further input over the next 12 months, including:

In mid 2018: Discussion paper on proposed changes to modernise the *Fisheries Act 1994*, to provide an increase in responsive decision making and address issues like black marketing.

In late 2018: Consultation on draft harvest strategies which will set out the pre-determined management actions for a defined species necessary to achieve the agreed ecological, economic and/or social objectives. This will include an implementation plan on how harvest strategies can be operationalised, and for commercial fishers it will outline any allocation processes.

In early 2019: Consultation on proposed changes to the fisheries regulation to implement the proposed management changes that have been developed in consultation with stakeholders and reflect the new approach using harvest strategies.

How to provide feedback

This discussion paper is designed to provide all stakeholders with the opportunity to have a say about the future management of the east coast inshore fishery.

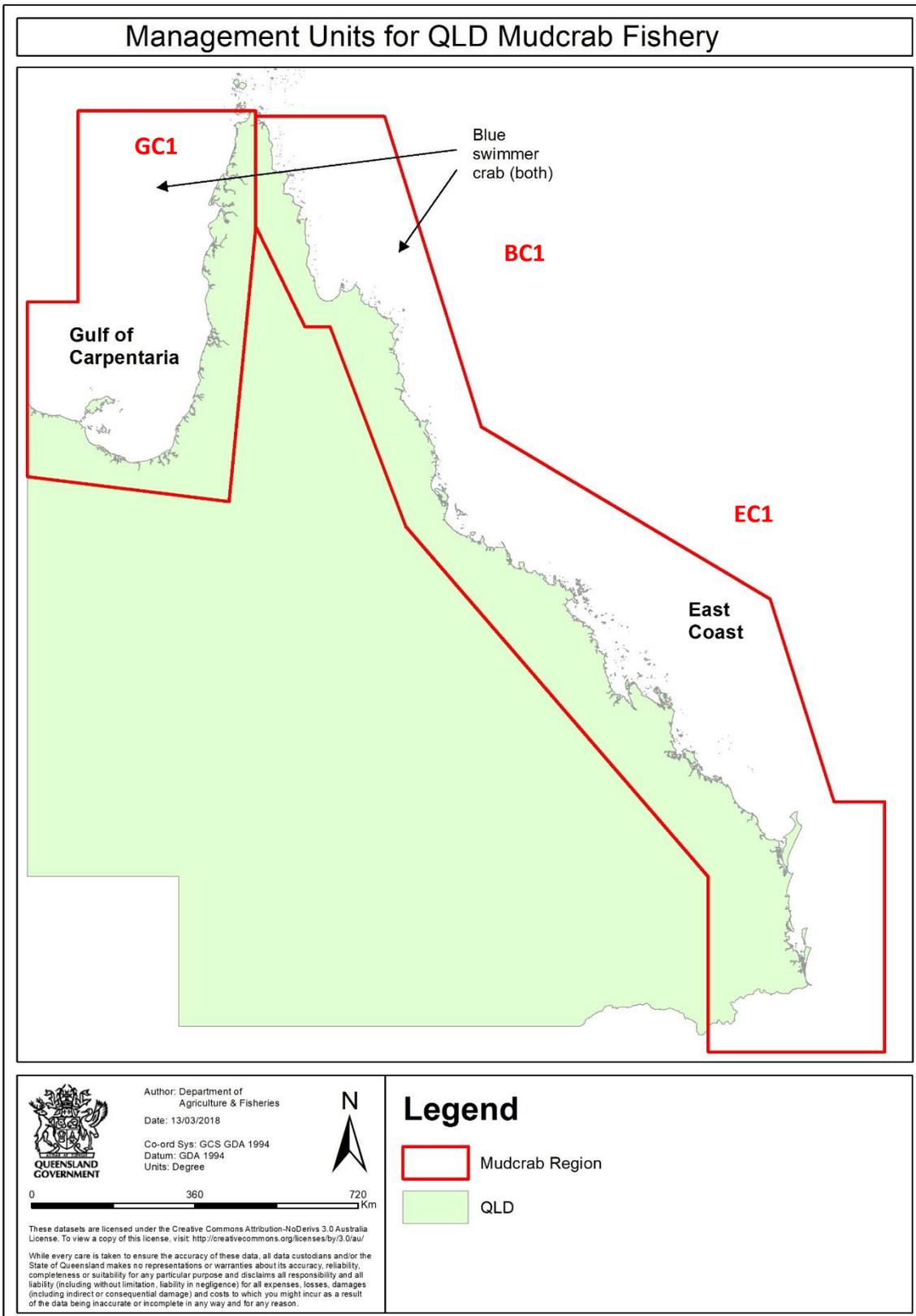
You can provide feedback by completing the online survey at daf.qld.gov.au/sustainablefisheriesstrategy.

Submission of feedback closes **Sunday 20 May 2018**.

Stakeholders can also give feedback when Fisheries Queensland staff visit regional centres in April and May 2018.

For more information, visit daf.qld.gov.au/fisheries or call 13 25 23.

Attachment 1 – Draft management units for the Queensland crab (mud and blue swimmer) fishery



Attachment 2: Northern Territory swim bladders tagging case study

Northern Territory swim bladders tagging case study

- In response to black marketing of Black jewfish swim bladders, the Northern Territory Government in consultation with industry, introduced authentication tags to reduce illegal sales and protect the sustainability of Black Jewfish stocks from illegal fishing activity.

Black marketing issue:

- Black Jewfish are being increasingly targeted for their swim bladders due to their high market value. This value was fuelling a black market in illegal trade of swim bladders.

Black Marketing Solution:

- The Northern Territory Government in consultation with industry introduced the requirement for all commercial fishers to use authentication tags on Black Jewfish swim bladders.
- All Black jewfish swim bladders need to be individually tagged by commercial fishers before they can be sold.
- Fish retailers and processors are no longer able to be in possession of a Black jewfish swim bladder that does not have a tag attached.
- The authentication tags contain unique numbering and lettering that enables individual identification of swim bladders and can be used to trace the fishery and operation from which the fish was harvested.
- Commercial fishers are required to purchase the tags from Fisheries Licensing at direct prices to avoid illegal duplication of the tags. Purchase can be achieved via phone or in person at the Fisheries Licensing.
- Approximately 18,000 tags have been purchased since the requirement to tag swim bladders was introduced in commercial operations in 2017.
- Commercial fishers are encouraged to report tag use which can become part of regular logbook reporting if required. There is also an incentive for commercial fishers to report tag use with the ability to roll over unused tags to the next year.



A tagged Black Jewfish swim bladder. Photo courtesy of the Northern Territory Department of Primary Industry and Resources

Tag costs in the Northern Territory:

- Tags cost 42 cents each and an additional one off charge of \$8 for the tag applicator (crimping tool).



Tagged Black Jewfish swim bladders. Photo courtesy of the Northern Territory Department of Primary Industry and Resources

Benefits to the Northern Territory fishing industry:

- reduced illegal fishing and black marketing
- improved monitoring and traceability of commercial catches
- increased enforcement ability to distinguish between legal and illegal product
- protection for commercial fisheries that sell Black jewfish swim bladders
- predicted increases in market value as the tags identify the fish product has been sourced legally from a sustainable fishery
- improved community expectations that compliance and monitoring is being achieved.



An example of tagged Queensland mud crabs