



Queensland mud crab fishery harvest strategy: 2021–2026

Business area owner Management & Reform

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What the harvest strategy is trying to achieve

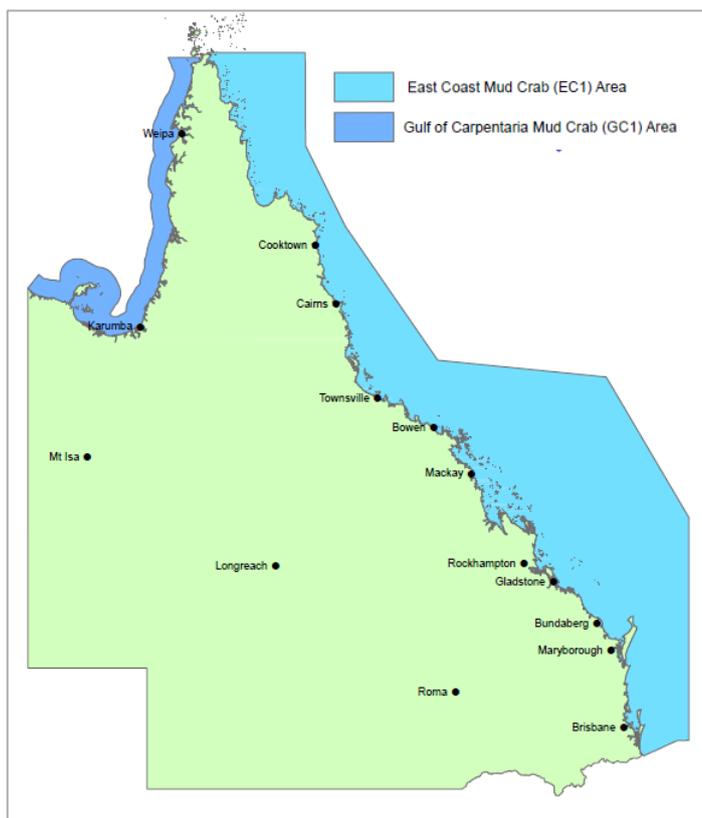
This harvest strategy has been developed in line with the *Queensland harvest strategy policy* to manage the harvest of Queensland's mud crab resource. The sustainability risk to mud crab stocks in Queensland is considered low due to management controls in place, including single sex harvest and a minimum legal size limit. The Queensland mud crab fishery is currently undergoing a period of transition, from a being a fishery with high effort and no effective catch limits, to being a quota-managed fishery.

The aim of this harvest strategy is to manage the fishing mortality of mud crabs through setting a total allowable catch (TAC) at a level that allows the stock to achieve specified biomass targets. Through the transition to quota management, improved catch and effort data from all sectors will build confidence in a biomass-based management approach in the future. The harvest strategy's decision rules are designed to set catch at levels appropriate for achieving the 60% exploitable biomass target for mud crabs, as well as to maintain catch shares amongst commercial, recreational and traditional fishing sectors. Exploitable biomass is the portion of a stock's biomass that is available to be harvested. In the case of mud crabs, exploitable biomass refers to legal size male mud crabs. Other management tools (e.g. size limits, spawning closures etc.) may also be used to support the sustainable management of stocks under this harvest strategy.

Fishery overview

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

It 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). The commercial catch has declined in recent years, with catches falling from around 1419 tonnes in 2011 to around 863 tonnes in 2017, while effort has remained high (37 000 fishing days per year). Importantly, from 2011 to 2017 the commercial catch per unit effort has reduced from 33 kg per day to a low of 23 kg per day. Many commercial fishers state these catch rates are no longer economically viable.



The reported mud crab catch from the Gulf of Carpentaria has dropped between 2011 (184 tonnes) and 2017 (130 tonnes). The reduced catch of mud crab in the Gulf of Carpentaria has been linked to low recruitment caused by 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).

While catch and effort in the Indigenous fishing sector is the least understood, it is assumed that this sector has comparatively low levels of effort in comparison to other sectors. Previous estimates suggest traditional harvest to be less than 20 tonnes per year.

Stocks covered by the harvest strategy

Two species of mud crabs are found in Australian waters – mud crab (*Scylla serrata*) and orange mud crab (*S. olivacea*). The former constitutes more than 99% of the commercial catch of mud crabs in the Northern Territory and Queensland, and the entire commercial catch in New South Wales. Genetic evidence suggests that there are at least two biological stocks of mud crabs in Australian waters – one to the west and another to the south-east of the Torres Strait.

Table 1: Summary of fish stocks covered by this harvest strategy

Feature	Details
Target species	Mud crab (<i>Scylla serrata</i>)
Other species	Orange mud crab (<i>S. olivacea</i>)
Biology	<p>Mud crabs are a fast-growing and highly fecund species. Growth rate appears to be accelerated in warmer northern and Gulf of Carpentaria waters. Growth is seasonal, with moulting activity mainly from September to January.</p> <p>Mud crabs are thought to spawn offshore. Egg numbers vary depending on the size of the female. Females generally hold between 2 and 10 million eggs for around 2 weeks. The age at first maturity is estimated to be between 12 and 18 months and longevity is between 3 and 4 years.</p>

Management units for the harvest strategy

The management units for this harvest strategy are:

- 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
- 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.

The fishery area is defined by the Fisheries (Commercial Fisheries) Regulation 2019.

Summary of management information

A summary of the management arrangements for the mud crab fishery is set out in Table 2. Fishers may access copies of fisheries legislation at legislation.qld.gov.au or visit fisheries.qld.gov.au for the latest information on fishing rules.

Table 2: Summary of management arrangements for the mud crab fishery

Feature	Details
Commercial access	Primary commercial fishing licence with a C1 fishery symbol
Relevant fisheries legislation	<p><i>Fisheries Act 1994</i></p> <p>Fisheries (General) Regulation 2019</p> <p>Fisheries (Commercial Fisheries) Regulation 2019</p> <p>Fisheries Declaration 2019</p> <p>Fisheries Quota Declaration 2019</p>
Other relevant legislation	<p><i>Great Barrier Reef Marine Park Act 1975</i> and Great Barrier Reef Marine Park Regulations 2019 (Cwlth)</p> <p><i>Marine Parks Act 2004</i></p> <p><i>Environment Protection and Biodiversity Conservation Act 1999</i> and Environment Protection and Biodiversity Conservation Regulations 2000 (Cwlth)</p>
Working group	<p>Crab fishery working group</p> <p>Terms of reference and communiques are available at fisheries.qld.gov.au</p>
Gear	<p>The following apparatus are currently permitted for use:</p> <p>Commercial</p> <ul style="list-style-type: none"> • Wire-mesh traps, trawl-mesh crab pots, and hoop/dilly • Pots can be arranged along a trotline (excluding some areas) • Escape vents must be installed in pots for mud crab fishery • Commercial fishers are limited to a maximum 50 pots, traps or dillies per C1 symbol • 100 pots can be used where a commercial fishing licence has two C1 symbols attached <p>Recreational</p> <ul style="list-style-type: none"> • Wire-mesh traps, trawl-mesh crab pots, and hoop/dilly (with restrictions) • Recreational fishers are limited to a maximum of 4 pots/dillies per person <p>Refer to the fisheries legislation for specific gear requirements and rules</p>

Feature	Details
Main management methods	<p>Commercial</p> <ul style="list-style-type: none"> The primary management method under the harvest strategy is individual transferable quota and associated total allowable commercial catch (TACC) for east coast and Gulf of Carpentaria mud crab A minimum quota entitlement of 1.2 tonnes is required for the intended management area (e.g. east coast mud crab) prior to the commencement of a fishing trip in that management area <p>Recreational</p> <ul style="list-style-type: none"> The primary management method under the harvest strategy is a total allowable recreational catch for east coast and Gulf of Carpentaria mud crab The management of the recreational harvest of mud crab is also managed by recreational in-possession limits Combined boat limit of two times the in-possession limit <p>Other management methods</p> <ul style="list-style-type: none"> Limited access through primary commercial fishing licences Vessel size (up to 25 m)
Fishing year	1 July – 30 June
Stock status	<p>Stock status is assessed using the nationally agreed Status of Australian Fish Stocks (SAFS) classification framework — east coast and Gulf of Carpentaria mud crab are listed as ‘sustainable’ (SAFS 2018)</p> <p>*Note: The classification system used as part of the SAFS reporting is assessed against a 20% biomass sustainability criteria. Therefore, although a species may be classified as ‘sustainable’ in SAFS, this does not mean that the biomass is meeting the targets set out in the <i>Queensland Sustainable Fisheries Strategy: 2017–2027</i>. For more specific species biomass estimates, consult the relevant stock assessment for that species.</p>
Accreditation under the Environment Protection and Biodiversity Conservation Act 1999	<p>Part 13: Accredited (expires 2022)</p> <p>Part 13A: Accredited (expires 2022)</p> <p>Visit environment.gov.au</p>

Fishery objectives

The objective of the harvest strategy is to manage the fishery in accordance with the objectives of the *Fisheries Act 1994* and the *Queensland Sustainable Fisheries Strategy: 2017–2027*.

Fishery objectives set out the direction and aspirations to be achieved in the long term. The primary objective for this fishery is to:

- maintain the mud crab resource at, or return it to, a target exploitable biomass level that aims to maximise economic yield (MEY) for the fishery.

In pursuing the primary objective, the harvest strategy aims to:

- minimise and mitigate any unacceptable ecological risks arising from fishing-related activities
- maintain appropriate sectoral allocations for the mud crab fishery resource
- maximise economic performance of the commercial sector
- manage excess capacity to improve social and economic benefits
- monitor the broader social and economic benefits of the fishery to the community.

Catch shares

This harvest strategy aims to maintain the existing catch shares between sectors. The resource allocation arrangements set out in Table 3 ensure that catch shares among sectors can be maintained in response to changes in the TAC.

Future reviews of the TAC will take into account the results from the latest statewide recreational fishing survey, any other available information relating to recreational harvest, and validated commercial catch over corresponding years. Table 3 outlines **indicative** catch shares (rounded to nearest 5%) for all sectors for mud crab, based on available data up to 2018.

The traditional fishing rights of Aboriginal peoples and Torres Strait Islanders are protected under native title legislation and relate to harvest for domestic, communal and non-commercial purposes. Accordingly, traditional and customary fishing is recognised in Queensland and is not a defined allocation.

Aboriginal peoples and Torres Strait Islanders and their communities continue to express a desire for more economic opportunities through fishing, particularly in their own sea country. The *Aboriginal and Torres Strait Islander commercial fishing development policy* provides for an Indigenous fishing permit to be issued, on a case-by-case basis and in accordance with section 54 of the Fisheries (General) Regulation 2019, to provide opportunities to take part in fishing-related business.

Table 3: Resource allocation arrangements for the mud crab fishery

Management unit	Commercial fishing ¹	Recreational fishing ²	Indigenous commercial fishing development
East coast mud crab	70%	30%	10 tonnes
Gulf of Carpentaria mud crab	90%	10%	6 tonnes

¹ Commercial catch share is informed by the 2013–17 catch average.

² Recreational catch share is informed by average harvest from 2010 and 2013 statewide recreational fishing surveys, and reported charter harvest.

Managing the performance of the fishery

Key indicators measure how the fishery is performing. The indicators relate to the objectives and use reference points to establish acceptable performance (Table 4). The indicators measure the relative amount of fish biomass of key stock(s) against target and other reference points.

The default biomass reference points identified in this harvest strategy are:

- a target reference point (*B_{targ}*) of 60% of the exploitable biomass being the relative biomass level the harvest strategy aims to achieve – this is also considered a proxy for achieving maximum economic yield (*B_{mey}*).
- a limit reference point of 20% of the exploitable biomass (*B_{lim}*) being the biomass level that the harvest strategy aims to avoid. If the stock is assessed to be below *B_{lim}*, the risk to the stock is unacceptably high and the stock is defined as ‘overfished’.

For key stocks, performance indicators and sustainable harvests for all sectors will be estimated from a stock assessment. The aim is to measure the capability for the stock to attain the target biomass level (*B_{targ}* 60%), and at which point the harvest strategy will be considered as meeting its objectives.

Table 4: Performance indicators and reference points for the mud crab fishery

Performance indicator	Type of reference point	Reference level
Mud crab biomass	Target (<i>B_{targ}</i>)	60% exploitable biomass
Mud crab biomass	Limit reference point (<i>B_{lim}</i>)	20% exploitable biomass
Estimated recreational harvest	Target harvest	2013 recreational survey + or - 12% standard error
Recreational limit change	Maximum change buffer	two crabs

The decision rules for setting a sustainable harvest in the mud crab harvest strategy are based on a ‘hockey stick’ approach. This is where the TAC is set based on a linear relationship between *B_{lim}*, where the level of fishing mortality (F) is equal to zero, and *B_{targ}*, where the exploitation rate and TAC are set at the level to achieve MEY (Figure 1 overleaf).

The decision rule takes into account the current biomass level of the stock for determining the TAC to achieve the *B_{targ}*. The recommended TAC is calculated by applying the rate of fishing mortality to achieve *B_{targ}* to the current exploitable biomass level. As a result, the recommended TAC represents the total catch from all sectors that can be harvested in the following years, to move the current biomass level towards the target level. A discount factor may also be included to account for uncertainty and to reduce the risk of a fishery not achieving its objectives.

If the exploitable biomass falls below *B_{lim}*, targeted fishing of the stock must cease until a rebuilding strategy is developed with an objective to rebuild the exploitable biomass above *B_{lim}* within a biologically reasonable timeframe (e.g. based on mean generation time¹) and as informed by the *Queensland Harvest Strategy Policy*.

¹ a generation is defined as the average age of full maturity for the fish species.

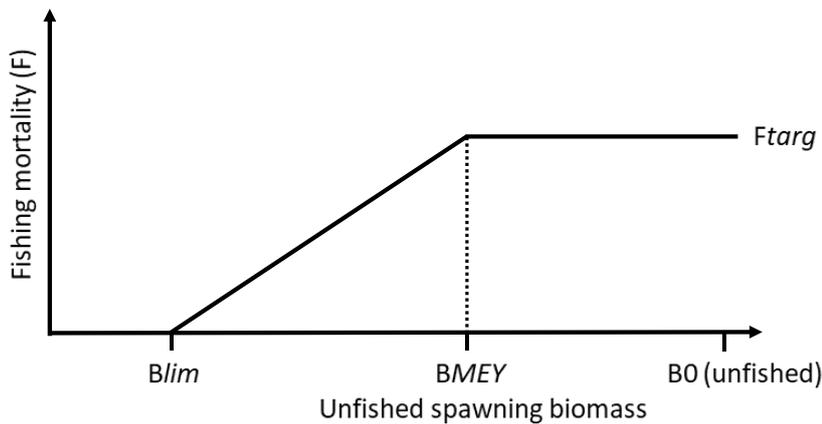


Figure 1: Showing the ‘hockey stick’ rule – *Blim* is limit reference point, *Bmey* is the biomass at MEY, *B0* is the unfished biomass at 100%, *F* is fishing mortality and *Ftarg* is the level of fishing mortality for *Bmey*

The decision rules in this harvest strategy are designed to maintain the TACC at a level that allows the fishery to meet a biomass exploitable target of 60% (as a proxy for MEY). The initial TACC for all sectors and the TACC for year 1 for the east coast and Gulf of Carpentaria mud crab fisheries will be informed by the Fisheries Queensland report, *Towards an Initial Quota for the Queensland Mud Crab Fishery*², as proposed in Table 5.

The decision rules will also aim to achieve rationalisation of the commercial fleet in order to further promote economic viability of the fishery. This rationalisation will be undertaken through a breakout rule (that requires a review of the target if prevailing fishery conditions move outside a particular range), which is aimed at maintaining the TACC at levels that effectively manage total commercial harvest (i.e. keeping the TACC within 30% of commercial harvest).

Table 5: Proposed catch limits for the mud crab fishery

Fishery area	TACC year 1	Indicative recreational harvest range*	Overall fishery TAC
East coast mud crab (EC1)	770 t	331 t (252 t – 410 t)	1101 t
Gulf of Carpentaria mud crab (GC1)	108 t	15 t (11 t – 19 t)	123 t

*The indicative recreational harvest range is based on the 2013 recreational harvest estimate plus or minus 2 x 12% reported standard error²

To meet the objectives of the fishery, the harvest strategy will also act to constrain all sectors within their allocated catch share. Should a new estimate of recreational harvest or catch from charter fishing logbooks indicate that a sector has increased their catch share outside of their allocated proportion for any TAC species, then adjustment will be made to constrain harvest within this share. Adjustments to the recreational fishing limits may be undertaken if large changes are made to the TAC for a species.

1. Northrop, A, O’Neill, MF & Robins, J 2019, *Towards an initial quota for the Queensland mud crab fishery*, Department of Agriculture and Fisheries, Queensland.
 2. Webley, J, McInnes, K, Teixeira, D, Lawson, A & Quinn, R 2015, *Statewide Recreational Fishing Survey 2013 -14*, technical report, Department of Agriculture and Fisheries, Queensland.

Management of target species

1.0 Decision rules for the commercial harvest of east coast mud crab (EC1) and Gulf of Carpentaria mud crab (GC1)

The decision rules below provide guidance to set the TACC based on estimate of biomass being available. The decision rules use the outputs of a stock assessment and aim to achieve a target biomass (*B_{targ}*) of 60% as a proxy for MEY. The decision rules also include breakout rules that are in place to ensure the TACC aligns with the commercial harvest level. See Appendix A.

-
- 1.1 If the biomass is at or above *B_{targ}*, set the TACC at a level that maintains biomass at *B_{targ}*.
 - 1.2 If biomass is below *B_{targ}* and above *B_{lim}*, the TACC should be set at a level where fishing mortality is reduced to the rate that allows the biomass to increase effectively back to *B_{targ}*.
 - 1.3 If biomass is at or below *B_{lim}*, there will be no targeted fishing permitted for that species, and a rebuilding strategy will be developed to increase the stock biomass to above *B_{lim}* within a biologically reasonable timeframe and as informed by the *Queensland Harvest Strategy Policy*.
 - 1.4 If any new information becomes available indicating that the assessment and TACC-setting arrangements are not consistent with the sustainable management of the fishery, decision rules must be reviewed and, if appropriate, the reference points or timeframes should be adjusted.

Notwithstanding that:

- 1.5 The rate of fishing mortality should not exceed that required to achieve *B_{targ}*.
AND
- 1.6 The TAC should not exceed the level of fishing mortality required to maintain a stock at maximum sustainable yield (MSY) at equilibrium.

Breakout rule

- 1.7 If the annual commercial harvest is 30% or more below the TACC, then the TACC will be reduced to 10% above the most recent annual commercial harvest.

2.0 Decision rules for the recreational and charter sector harvest of mud crab

The below decision rules have been designed to maintain catch shares between sectors. If a new estimate of recreational or charter harvest indicate that either sector have increased their catch outside of their allocated catch share, then management action will be taken to constrain them within this share.

-
- 2.1 If a recreational harvest estimate is no more than 12% above the allocated recreational catch proportion, then no management action is required.
 - 2.2 If an estimate of recreational harvest exceeds the catch share by greater than 12%, the recreational in-possession limit will be decreased.
 - 2.3 If a stock assessment recommends an increase in the TACC to a level that would result in an increase or decrease to the commercial catch share by 25% or more, then the recreational in-possession limit will be adjusted to ensure catch shares match allocated proportions.

Notwithstanding that:

- 2.4 If a stock is below *B_{lim}* and a stock assessment recommends a TAC of zero, no targeted fishing for the species will be permitted for all sectors.
 - 2.5 The new recreational limit must not be increased or decreased by more than two crabs in any given year.
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Management of ecological risks from fishing

A foundation of sustainable fisheries management is managing the impact of fishing activities on non-target species and the broader marine ecosystem. Ecological risk assessments (ERA) identify and measure the ecological risks of fishing activity and identify issues that must be further managed under harvest strategies. The decision rules below are in place to minimise and mitigate high ecological risks arising from fishing-related activities.

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- 3.1 If an ERA identifies fishing impacts that are considered to generate an undesirable level of risk to any ecological component, a review is triggered to investigate the reason for the increased risk. Appropriate management action should be taken to reduce the risk to an acceptable level.
-

The most recent ERA for the mud crab fishery was completed in 2019. It identified two ecological components at higher risk, target and by-product species and marine turtles, that are being progressed to a species-specific level 2 ERA.

Fisheries Queensland developed the [Ecological risk assessment guideline](#) to assess ecosystem impacts of fishing activities. Future risk assessments will be undertaken in line with the guideline to reassess any current or new ecological risks that may arise in the fishery. ERAs can be undertaken more frequently if there are significant changes identified in fishery operations, management activities or controls that are likely to result in a change to previously assessed risk levels.

Monitoring social and economic performance

The *Queensland Sustainable Fisheries Strategy: 2017–2027* outlines the target to set sustainable catch limits based on achieving maximum economic benefits of the resource, taken initially to correspond to around 60% of unfished biomass. This is to support the most economically efficient use of the resource, improve the fishing experience for all sectors and promote a resilient system that can bounce back from other adverse environmental conditions (e.g. floods). The harvest strategy rules have been set up to maintain the stock to this target biomass level.

The objectives listed in Table 6 will be used to monitor the social and economic performance of this fishery. The management options outlined are intended to provide some guidance on the options that could reasonably be considered alongside the decision rules, if fishery trends are of concern.

Table 6: Social and economic indicators for the mud crab fishery

Objective	Performance indicators	Management options
Maximise economic performance of the commercial sector	Potential indicators to monitor include: <ul style="list-style-type: none"> • capacity utilisation • catch per unit effort (average per day) • costs, earnings and net financial and economic profit • net economic returns, gross state product, gross value of production • quota sale and lease price • profit decomposition (using profit or lease price) to determine impacts of prices, costs and stock/catch rates on changes in profits 	Consider regulatory and non-regulatory options Adjust management as needed Options include minimum quota holding, latent effort review
Monitor the broader social and economic benefits of the fishery to the community	Potential indicators to monitor include: <ul style="list-style-type: none"> • fisher satisfaction (with their fishing experience – commercial and recreational) • Recreational fisher participation and economic information • percentage of quota/licences that are owned (rather than leased) • Gini coefficient of quota owner (measure of concentration) • percentage of total costs/inputs purchased from local businesses/residents • income generated (crew plus profit – gross value added) • proportion of catch sold locally • fish prices • number of platforms / number of active licences/ total capacity • community satisfaction (with their fisheries and the way in which they are managed) 	Consider regulatory and non-regulatory options Adjust management as needed

Data collection, validation and assessment

Fishery-dependent information (self-reported)

Catch and effort data is obtained through commercial logbook returns and real-time landing reports. The catch and effort data required to determine the standardised commercial catch rate for key species are obtained from catch and effort logbook returns and vessel tracking data. The mud crab fishery logbook is available at business.qld.gov.au. Charter operators also record catch information in logbooks, which is included as recreational harvest.

Fishers are also required to report any interactions with protected species in a mandatory threatened, endangered and protected animal logbook.

Fishery-dependent data (independent validation)

All commercial fishing vessels are required to have vessel tracking systems installed and active on their vessels. Vessel tracking data is used to verify effort information reported in commercial fishing logbooks. As a quota-managed fishery, compulsory quota unload reports provide an accurate record of the catch. Queensland Boating and Fisheries Patrol undertakes routine and intelligence-based at-sea and landing (unload) inspections to check compliance and validate reported information.

Surveys of recreational fishers at boat ramps and data from the statewide recreational fishing surveys and Keen Angler Program help provide important information on recreational harvest.

Scientific assessment of stock

No modelled stock assessment is currently available for the mud crab fishery. A Fisheries Research and Development Corporation-funded research project is underway to provide information on spatial stock structure of mud crabs and key biological information (see Table 7). It is anticipated that this will enable a stock assessment to inform the TAC-setting process every three years.

Information and research priorities

Key information and research priorities have been identified in Table 7 to help meet the objectives of this harvest strategy. These will be updated as required.

Table 7: Information and research priorities for the mud crab fishery

Project description	Explanation of need	Priority
Spatial stock structure of mud crabs	Currently information on the stock structure of mud crab uses older genetic methods (mitochondrial DNA). The assessment and management of mud crabs would benefit from the use of additional work to investigate stock structure at a finer spatial scale (i.e. using new genetic methods, parasites or tagging).	High
Establish a pre-recruit abundance for TAC adjustment	Developing a pre-recruit index through a pot sampling program may allow a harvest strategy to be developed that can account for environmentally driven inter-annual fluctuations in mud crab availability	High
Improve key biological information	Male to female ratios for spawning-stock recruitment relationship, growth, mortality and movement achieved in the short-term by tagging work and in the long-term by fishery-dependent 'survey-pot' monitoring program	High

Schedule of performance monitoring, assessment and review

Annual performance monitoring and assessment

The fishery’s performance will be reviewed against this harvest strategy **annually**. This review will include convening the crab fishery working group to provide operational advice on the fishery’s performance and any matters that may need addressing.

The primary performance measure is exploitable biomass, which will be used to review the TAC in year 5 of the harvest strategy, with a review of catch and effort data in other years. If a biomass estimate becomes available prior to the scheduled timeframe that indicates the TAC should be adjusted in order to meet the objectives of the fishery, then the TAC for that year should be reviewed.

While harvest strategies provide certainty and transparency in terms of management decisions in response to certain fishery information, there must also be flexibility to allow new information or changing circumstances to be appropriately considered. There may be instances in which a stock assessment may need to be available prior to, or delayed beyond, the scheduled date. Any change to the stock assessment schedule should be considered by the harvest strategy workshop and decided on by the chief executive based on the below conditions:

- If during the period between scheduled stock assessments the chief executive is concerned that a performance indicator (e.g. stock status, standardised commercial catch rate, total harvest) suggests the stock is not performing in a way that will achieve the target biomass level, the chief executive may decide that a stock assessment will be undertaken before the scheduled timeframe.
- If the chief executive is satisfied that (1) indicators for the stock suggest it is achieving, or rebuilding to, target biomass levels, and that there is a low ecological risk to the stock under the current management arrangements, or (2) if resourcing requirements prohibit the ability for an assessment to be delivered in the scheduled timeframe, the chief executive may decide that a scheduled stock assessment will be delayed.

Table 8: Schedule of performance monitoring, assessment and review

	Year 1 2021–22	Year 2 2022–23	Year 3 2023–24	Year 4 2024–25	Year 5 2025–26
Monitoring and assessment activity	Catch and effort monitoring	Catch and effort monitoring	Catch and effort monitoring	Catch and effort monitoring	Modelled assessment
Management activity	Review of catch and effort data	Review of catch and effort data	Review of catch and effort data Bring forward TAC decision if needed Note breakout rule for TACC change	Review of catch and effort data Bring forward TAC decision if needed Note breakout rule for TACC change	Review of TAC and in-possession limits Declaration made if required

Harvest strategy review

This harvest strategy will remain in place for a period of five years, after which time it will need to be fully reviewed in accordance with the *Fisheries Act 1994*.

The harvest strategy may be subject to further review and amendment as appropriate within the five-year period if any of the following circumstances arise:

- there is new information that substantially changes the status of the fishery, leading to improved estimates of indicators relative to reference points
- drivers external to management of the fishery increase the risk to fish stock/s
- a new recreational harvest estimate becomes available that suggests the defined sectorial catch shares may have been set incorrectly or may be unrepresentative
- it is clear the harvest strategy is not working effectively, and the intent of the *Queensland harvest strategy policy* is not being met.

For more information on the processes for amending harvest strategies, refer to the [Queensland harvest strategy policy](#).

Acronyms and definitions

Acronym/term	Definition
Biomass	Total weight or volume of a stock or component of a stock (e.g. spawning stock biomass would refer to all adult (reproductively mature) fish in a population)
B0	Biomass at zero fishing, or unfished biomass
Biomass at maximum economic yield (B_{mey})	The average biomass that corresponds to maximum economic yield
Biomass limit reference point (B_{lim})	The point beyond which the risk to the stock is regarded as unacceptably high
Biomass target (B_{targ})	The desired biomass of the stock
Bycatch	A species that is incidentally either: <ul style="list-style-type: none"> • taken in a fishery and returned to the sea • killed or injured as a result of interacting with fishing equipment in the fishery, but not taken Bycatch can include protected species
By-product	Any part of the catch that is kept or sold, but is not the target species By-product makes some contribution to the value of the catch in a fishery but less than that of key commercial species
Catch per unit effort	The number or weight of fish caught by a unit of fishing effort Can be used as an index of relative abundance or indicator of change in the fishery
Ecological risk assessment (ERA)	An assessment process that evaluates the relative risk posed by fishing on species, habitats and communities within a fishery
F	Fishing mortality
F_{targ}	Fishing mortality target
Individual transferable quota	Amount of catch or effort allocated to an individual fisher or company
Maximum economic yield (MEY)	Sustainable level of harvest that allows net economic returns (profit) to be maximised
Maximum sustainable yield (MSY)	The maximum average sustainable annual fishing mortality that can occur on a stock over an indefinite period under prevailing environmental conditions
SAFS	Status of Australian Fish Stocks
Total allowable catch (TAC)	The harvest limit set as an output control on fishing for all fishing sectors
Total allowable commercial catch (TACC)	The harvest limit set for the commercial fishing sector usually achieved through setting TACC, but sometimes through input controls

Appendix A: Decision rules for mud crabs

