Commercial trawl fishery (fin fish) stout whiting harvest strategy: 2021–2026

Queensland Government

Business unit owner	Management & Reform
Endorsed by	Deputy Director-General (Fisheries & Forestry) in accordance with delegated powers under Part 2, Division 1 (Harvest Strategies) of the *Fisheries Act 1994*
Approved by	Minister responsible for fisheries in accordance with section 16 of the *Fisheries Act 1994*

Revision history

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0.01	September 2020	Draft harvest strategy for consultation
1.00	June 2021	Approved harvest strategy

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Contents

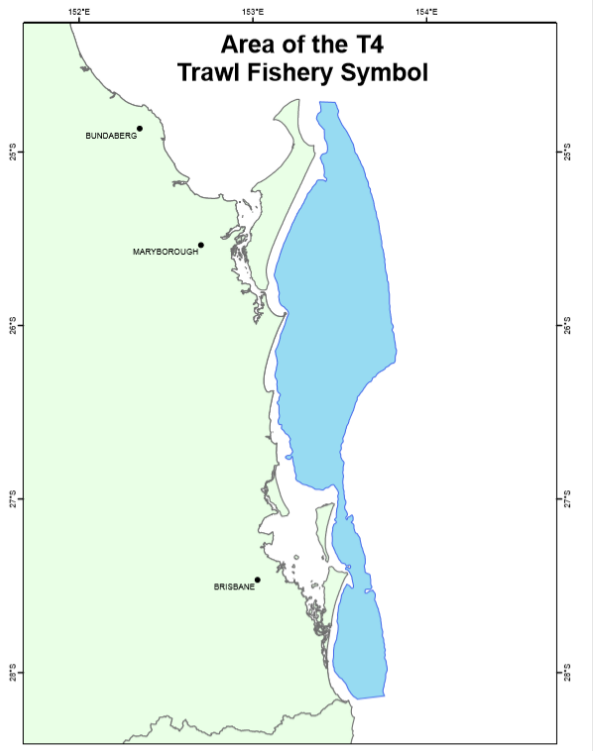
What the harvest strategy is trying to achieve

This harvest strategy has been developed in line with the *Queensland harvest strategy policy* to manage the harvest of Queensland's stout whiting resource. The stout whiting stock level is currently assessed as sustainable, with spawning biomass estimated to be above biomass associated with maximum sustainable yield. The risk of fishing to the sustainability of the stock is considered low due to the existing management framework and the low number of operators with access to the fishery. While stout whiting is the target species in the fishery and constitutes the majority of harvest, a handful of other species are permitted to be taken, with some catch limits in place.

This harvest strategy aims to manage fishing mortality by setting sustainable catch limits at a level that allows the target stock to rebuild to its biomass targets. For all other retained species, catch triggers have been designed to monitor changes in fishing behaviour or stock trends to allow for detection of any change in catch compared to historical levels. 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 commercial trawl fishery (fin fish) (CTFFF) targets stout whiting (*Sillago robusta)* in water depths of 20–50 fathoms between Sandy Cape and the Queensland-New South Wales border. Stout whiting is managed under a total allowable commercial catch (TACC) for prescribed whiting, which also allows licence holders to retain red spot whiting (*Sillago flindersi*). Licence holders are also permitted to retain other by-product species such as yellowtail scad (*Trachurus novazelandiae*) and goatfish (Mullidae family) under individual non-transferable quota units.



Trip limits are in place for squid, octopus, cuttlefish and threadfin bream. Licence holders are also permitted to retain Moreton Bay and Balmain bugs with no catch limits in place. It is a limited access fishery, with five T4 licences currently operated by two licence holders – one using Danish seine gear and the other using otter trawl nets.

There is no recreational harvest of stout whiting; however, recreational fishers do catch yellowtail scad as a bait species. Stout whiting is a bycatch species in the eastern king prawn trawl fishery, which is likely to be a large source of fishing mortality.

The fishery has been managed under a TACC since 1997. Stock assessments are scheduled to set the TACC every three years. In interim years, annual monitoring of standardised catch rates and fishery trends occur for comparison to a reference period to monitor performance and if needed adjust the TACC for the following year, based on achieving longer term target biomass levels.

Catch-at-age frequencies were also assessed against management reference points until 2016. Historical commercial catch peaked at 2400 tonnes in 1995, when five boats were active in the fishery, before dropping to a historical low of 300 tonnes in 2003. Between 2017 and 2020, the TACC was set at 1106 tonnes and catch averaged between 800 and 1106 tonnes.

Stocks covered by the harvest strategy

While stout whiting are the primary target species, this harvest strategy also manages a number of other permitted species that can be retained while operating under a T4 licence. Table 1 provides a summary of fish stocks covered under this harvest strategy.

Stout whiting (*Sillago robusta*) are a species endemic to Australian waters. The east coast stock is restricted to southern Queensland and northern New South Wales. Genetic analysis of stout whiting catches from southern Queensland locations indicates that biological sub-stocks are unlikely to exist.

There are two management units for the east coast stout whiting stock. One in Queensland that is managed by Fisheries Queensland and another in New South Wales that is managed by the New South Wales Department of Primary Industries. Currently, approximately 80% of the annual catch comes from Queensland and 20% from New South Wales. This harvest strategy only manages the Queensland part of the stock, but information from both jurisdictions informs management decisions and is included in stock assessments.

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

Feature	Details
Target species (tier 1)	The target species is stout whiting (*Sillago robusta*) The target species is managed under a TACC for prescribed whiting, which also includes red spot whiting (*Sillago flindersi*) The majority (>99%) of the harvest is stout whiting
Secondary species (tier 2)	Yellowtail scad (*Trachurus novaezelandiae*) and Goatfish (Family Mullidae) are managed under TACC through individual non-transferable quota associated with the T4 symbol
By-product species (tier 3)	Permitted trawl species: • threadfin bream/pinkies (family Nemipteridae) are managed using trip limits • octopus (*Octopus sp.*) are managed using trip limits • cuttlefish (*Metasepia sp., Sepia spp.*) are managed using trip limits • squid (*Loliolus sp., Notodarus spp., Photologio spp., Sepioteuthis spp.*) are managed using trip limits • Balmain bugs (*Ibacus spp.*) are not subject to any catch limits • Moreton Bay bugs (*Thenus spp.*) are not subject to any catch limits
Biology	Stout whiting live to a maximum of 10 years off southern Queensland, reaching a maximum size of 23 cm at around 5 years of age 50% maturity is reached at 2–3 years, corresponding 14–18 cm Peak spawning season is thought to occur between August and November each year; however, data suggests stout whiting may have several spawning periods per season.

Management units for the harvest strategy

The single management unit for this harvest strategy is waters of 20–50 fathoms between Sandy Cape and the New South Wales border. The fishery area is defined in Schedule 8 of the Fisheries (Commercial Fisheries) Regulation 2019.

Summary of management information

A summary of the management arrangements for the CTFFF are 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 CTFFF

Feature	Details
Commercial access	Primary commercial fishing licence with a T4 fishery symbol
Relevant fisheries legislation	*Fisheries Act 1994* Fisheries (General) Regulation 2019 Fisheries (Commercial Fisheries) Regulation 2019 Fisheries Declaration 2019 Fisheries Quota Declaration 2019
Other relevant legislation	*Marine Parks Act 2004* *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
Regional harvest strategy workshop	Stout whiting harvest strategy workshops are held at least annually Further advice on proposed management arrangements and fishery performance will be shared with the trawl fishery working group. Terms of reference and communiques are available at fisheries.qld.gov.au
Gear	Otter trawl or Danish seine apparatus may be used Refer to fisheries legislation for gear requirements
Main management methods	Primary management method is individual transferable quota units and a TACC for prescribed whiting Other management methods include: • individual non-transferable quota for yellowtail scad and goatfish • in-possession limits (trip limits) for cuttlefish, squid, pinkies and octopus • spatial and temporal closures • gear restrictions such as length and size
Fishing year	1 January – 31 December

Feature	Details
Stock status	Stock status is assessed using the nationally agreed Status of Australian Fish Stocks (SAFS) classification framework – stout whiting are listed as '**sustainable'** (SAFS 2018) *Note: The classification system used for SAFS reporting is assessed against a 20% biomass sustainability criteria. Therefore, although a species may be classified as 'sustainable' under SAFS, this does not mean that the biomass is meeting the targets set out in the *Queensland Sustainable Fisheries Strategy: 2017–2027*. For more specific species biomass estimates, consult the relevant stock assessment for that species.
Accreditation under the *Environment Protection and Biodiversity Conservation Act 1999*	Part 13: Accredited (expires 31 August 2023) Part 13A: Accredited (expires 31 August 2023) Visit environment.gov.au

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 aspirations and operational direction for the management of this fishery. The primary objective of the CTFFF is to:

- maintain the target species at, or return to, a target spawning biomass level that aims to maximise economic yield 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
- monitor the broader social and economic benefits of the fishery to the community
- maximise economic performance of the commercial sector.

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 are maintained in response to changes in the total allowable catch (TAC). The existing resource allocation arrangements (as at 2019) are set out in Table 3.

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 to have 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 CTFFF

Species	Commercial fishing*	Recreational fishing** (including charter)
Prescribed whiting	99%	1%

* Commercial catch data is based on the existing commercial catch level.

** Recreational catch share includes charter fishing and is based on information from statewide recreational fishing surveys.

Managing the performance of the fishery

Biomass-based performance indicators and reference points for target species

Key indicators measure the fishery's performance. The indicators relate to the objectives and use reference points to establish acceptable performance (Table 4 overleaf). 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 48% unfished spawning biomass being the relative biomass level the harvest strategy aims to achieve – this is considered a proxy for achieving maximum economic yield (B*mey)* for the purposes of this harvest strategy and is consistent with proposed management of the shared stock by New South Wales.
- a limit reference point of 20% of the unfished spawning biomass (B*lim*) being the biomass level that the harvest strategy aims to avoid – if there is evidence that a stock is more susceptible to fishery depletion due to conservative life history characteristics, a higher limit reference point (e.g. 30%) may be considered. 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'.

A target reference point (B*targ*) of 48% has been set for this fishery for consistent shared stock management with New South Wales. Management of a single stock should have agreed targets to ensure that consistent decisions are made between jurisdictions and that historical catch shares are maintained. Further, a 48% target reference point is acceptedas a proxy for B*mey* under the *Commonwealth fisheries harvest strategy policy*.

For key stocks in this fishery, performance indicators and sustainable harvests for all sectors will be estimated from a stock assessment every three years. The aim is to measure the capability for the stock to attain the target biomass level (B*targ* 48%), and at which point the harvest strategy will be considered as meeting its fishery objectives.

The decision rules for setting a sustainable harvest in the CTFFF 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 is set at the level to achieve maximum economic yield (MEY) (Figure 1).

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 spawning biomass level. As a result, the recommended TAC represents the total catch from all sectors (including discards) that can be harvested, 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 spawning biomass of a stock falls below B*lim*, targeted fishing of the stock must cease and a rebuilding strategy be developed with an objective to rebuild the B*lim* within a biologically reasonable timeframe (e.g. based on mean generation time) and as informed by the *Queensland Harvest Strategy Policy*..

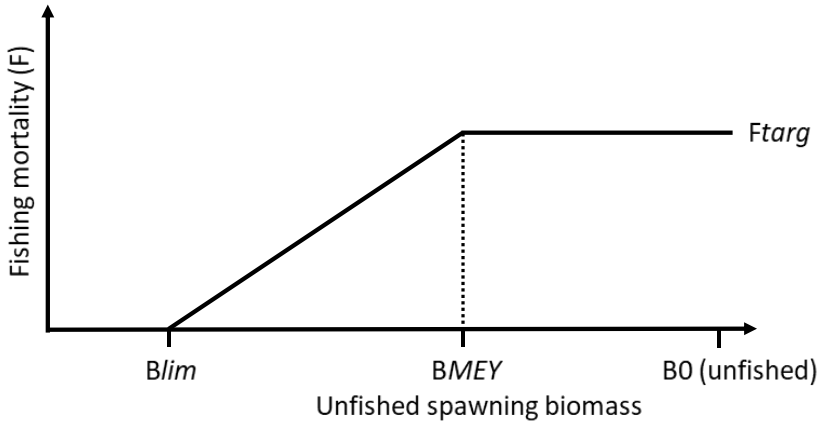


Figure 1: Showing the 'hockey stick' rule – B*lim* is limit reference point, B*mey* is the biomass at MEY, B0 is the unfished biomass at 100%, F is fishing mortality and F*targ* is the level of fishing mortality for B*mey*

Secondary performance indicators and reference points for target species

For years where updated biomass estimates are unavailable for stout whiting, the TAC will be assessed and managed using the secondary performance indicator of standardised commercial catch per unit effort (CPUE). The reference points for the standardised CPUE component of the decision rules are based on a reference period that corresponds to high catch rates and improved biomass, which indicate good levels of sustainability. By aligning the target reference points to a reference period, the harvest strategy aims to maintain biomass trends associated with this reference period to help the fishery achieve its objectives.

The target reference point for stout whiting standardised CPUE has been calculated based on the average of commercial catch rates during the reference period (Table 4 overleaf). If the stock is operating at target levels, it is deemed to be achieving the fishery objectives and operating at an acceptable level.

Management of secondary commercial and by-product species

If biomass is not available as a primary performance indicator for secondary (tier 2) and by-product (tier 3) species, commercial harvest will be monitored to assess changes in fishing mortality.

Secondary species (tier 2) are those where TACCs are available (i.e. goatfish and yellowtail scad) and harvest is monitored against the competitive TACC in consecutive years. If a TACC is reached in consecutive years, species may be subject to increased monitoring, stock assessment or management action.

By-product species (tier 3) have either trip limits or no-catch limits in place (i.e. threadfin bream, cuttlefish, octopus, squid, Moreton Bay bugs and Balmain bugs). Annual harvest of by-product species will be monitored against the historical maximum catch in a set reference period to detect changes in fishery behaviour that may represent unacceptable risk to sustainability. The reference period (Table 4) represents a period of stable catch and effort in the fishery. As the level of exploitation increases above historic levels, species may be subject to increased monitoring, stock assessment or management action.

Table 4. Performance indicators and reference points for the CTFFF

Species	Performance indicator	Reference point / buffer	Reference level
Stout whiting	Spawning biomass	Target (B*targ*)	48% spawning biomass
Stout whiting	Spawning biomass	Limit reference point (B*lim*)	20% spawning biomass
Stout whiting	Standardised commercial catch rate	Target reference point proxy for B_{targ}	2019–2020 average catch rate
Secondary and by-product species (if available) (tier 2 and tier 3)	Biomass	Target (B*targ*)	60% biomass
Secondary and by-product species (if available) (tier 2 and tier 3)	Biomass	Limit reference point (B*lim*)	20% biomass
Secondary and by-product species (tier 2 and tier 3)	Logbook catch	Catch trigger – reference period	2010–2019 maximum annual catch or TAC

Management of target species

1.0 Biomass based decision rules for target species

The decision rules provide guidance to set the TACC based on estimates of biomass being available. The decision rules use the outputs of the stock assessment and aim to achieve a target biomass (B*targ*) of 48%.

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 as inferred by the hockey stick approach, 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 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*.

1.6 The TACC should not exceed the level of fishing mortality required to maintain a stock at maximum sustainable yield at equilibrium.

2.0 Decision rules for standardised catch rate adjustments between stock assessment years

2.1 If the average standardised CPUE of the two most recent years is above the target reference point, then the TACC will be increased proportional to the difference between the average standardised CPUE and pooled index.

2.2 If the average standardised CPUE of the two most recent years is below the target reference point, then the TACC will be decreased proportional to the difference between the average standardised CPUE and pooled index.

2.3 If and when any new information becomes available indicating that the assessment and TACC-setting arrangements are not consistent with the sustainable management of the fishery, the scientific method and review rules must be reviewed and, if appropriate, the reference points must be adjusted.

Notwithstanding that:

2.4 The TACC should not exceed the level of catch required to achieve B*targ* (.

2.5 If the catch rate index is 30% or more below the reference point index, determine why the decline occurred and whether further management intervention is required to reduce the risk to the stock.

Management of secondary and by-product species

3.0 Decision rules for secondary species

The secondary species are classified as tier 2 species in this fishery and have TAC limits in place. The harvest control rules below monitor effort shift to ensure there is no unacceptable levels of fishing pressure for tier 2 (i.e. goatfish and yellowtail scad).
The harvest strategy also includes decision rules to allow management arrangements to be implemented if updated biomass estimates become available.

3.1 If the annual commercial catch is less than the TACC for that species, then no management action is required.

3.2 If the annual commercial catch reaches the TACC in two consecutive years, a review is undertaken to understand the reason for increased harvest and to assess risks. If the review identifies that a species is of increasing importance, the species may be considered for further stock assessment, monitoring or management action. If the review identifies sustainability of a species is at risk, a stock assessment for this species is required within three years.

3.3 If a stock assessment becomes available, then the stock assessment will be used to inform the management of the species, including setting of the TACC.

4.0 Decision rules for by-product species

By-product species are classified as tier 3 species in this fishery and have trip limits or no limits in place. The harvest control rules below monitor effort shift to ensure there is no unacceptable levels of fishing pressure for tier 3 species (e.g. threadfin bream, octopus, cuttlefish, squid, Balmain bugs and Moreton Bay bugs). The decision rules provide for management arrangements to be implemented if biomass estimates become available.

4.1 If the annual commercial catch of any species is less than the 2010–2019 maximum annual catch (i.e. 14 tonnes for pinkies, 2 tonnes for octopus, 2 tonnes for cuttlefish, 4 tonnes for squid, 1 tonne for Balmain bugs and 2 tonnes for Moreton Bay bugs), then no management action is required.

4.2 If the annual commercial catch of any species is greater than of the 2010–2019 maximum annual catch for two consecutive years, a review is undertaken to understand the reason for this increased harvest and assess the risks. If the review identifies that a species is of increasing importance, the species may be considered for further stock assessment, monitoring or management action. If the review identifies sustainability of a species is at risk, a stock assessment for this species is required within three years.

4.3 If a stock assessment becomes available for any by-product species, then the stock assessment will be used to inform the management of these species.

5.0 Break out rules for secondary and by-product species

5.1 If a biomass estimate is available through a stock assessment for secondary or by-product species that indicates a reduction in fishing mortality is required to achieve B*targ* or avoid B*lim*, then management action must be taken (e.g. trip limits, size limits or spatial/temporal closures) to pursue the fishery objectives.

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.

6.1 If an ERA identifies fishing impacts that are considered to generate an unacceptable level of risk to any component of the assessment, a review is triggered to investigate the reason for the increased risk. Appropriate management action will be taken to reduce the risk to an acceptable level.

In line with the *Ecological risk assessment guideline*, the most recent ERA for the CTFFF was completed in 2020. Most ecological components were assessed to be of low or negligible risk. The components that received a higher risk rating were as follows:

- Bycatch (non-species of conservation concern) was assessed with an intermediate risk rating and will be progressed as information and research priorities.
- Batoids were assessed with an intermediate risk rating and will be progressed as information and research priorities.
- Sharks were assessed with a low/intermediate risk rating and will not be progressed further.
- Marine habitats were assessed with a low/intermediate risk rating and will not be progressed further.

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 in fishing operations or management 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 B*mey* (usually around 60% of unfished biomass) to support the most economically efficient use of the resource, improve the fishing experience for all sectors and promote a resilient system that can respond to other adverse environmental conditions (e.g. floods, cyclones and bleaching).

For this fishery, a biomass target of 48% has been set (as a proxy for B*mey*) for consistent management of the shared stock with New South Wales. A biomass target of 48% is a commonly used proxy for B*mey* in commercial-only fisheries and is consistent with the *Commonwealth fisheries harvest strategy policy*. The harvest strategy decision rules have been set up to achieve this target biomass level.

The objectives and performance indicators in Table 5 (overleaf) will be used to monitor the social and economic performance of this fishery. The management options outlined are intended to provide some guidance on options that could reasonably be considered alongside the decision rules if fishery trends are of concern.

Table 5: Social and economic indicators for the CTFFF

Objective	Performance indicators	Management actions
Maximise economic performance of the commercial sector	Potential indicators to monitor include: • capacity utilisation • costs, earnings and net financial economic profit • net economic return, gross state product, gross value of production • profit decomposition to determine impacts of prices, costs and stock/catch rates on changes in profits	Consider regulatory and non-regulatory options to address relevant issues Adjust management as needed Option/s could include reviewing opening/closing times or spatial closures to maximise profitability
Monitor the broader social and economic benefits of the fishery to the community	Potential indicators to monitor include: • fisher satisfaction with their fishing experience • percentage of total costs/inputs purchased from local businesses and residents • income generated (crew plus profit – gross value added) • proportion of catch sold locally • fish prices • community satisfaction (with their fisheries and the way in which they are managed)	Consider regulatory and non-regulatory options to address relevant issues Adjust management as needed
Maintain Wildlife Trade Operation (WTO) accreditation under the *Environment Protection and Biodiversity Conservation Act 1999*	Number of conditions met as required through WTO accreditation.	Amend fisheries legislation or implement other measures as required to align with best practice and maintain accreditation

Data collection, validation and assessment

Fishery-dependent data (self-reported)

Catch and effort data is obtained through commercial logbook returns and real-time landing reports. The catch and effort data is used to determine the standardised commercial catch rate for key species and contributes to stock assessments. Commercial catch rates are standardised according to gear, season and location, along with a range of other potential influencing variables. The CTFFF logbook is available at business.qld.gov.au.

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 unload reports provide an accurate record of the catchQueensland Boating and Fisheries Patrol undertake routine and intelligence-based at-sea and landing (unload) inspections to check compliance and validate reported information.

Fishery-independent data (independent validation)

A detailed Data Collection and Validation Program for the CTFFF is at Attachment 1. It outlines improvements to ensure that data collected on bycatch and threatened, endangered and protected animal species interactions is reliable and sufficient to assess, monitor and manage the sustainability of the CTFFF and risk to non-target species.

Scientific assessment of stock

A stock assessment was completed in 2021 and estimated the stock level to be 41% unfished biomass, having rebuilt from a low in 2000. The stock assessment used a length-and-age structured population model and incorporated commercial harvest, historical commercial harvest and age-length monitoring data. The stock assessment provided recommended biological harvests and forward projections to achieve 60% biomass by 2040.

Information and research priorities

Key information and research priorities have been identified in Table 6 to help meet the objectives of this harvest strategy. These will be reviewed and updated as required through the harvest strategy workshop.

Table 6: Information and research priorities for the CTFFF

Project description	Explanation of need	Priority
Improving the level of information on catch compositions for elasmobranchs (e.g. batoids and sharks) and other non-target species	Improve information on bycatch compositions to address ecological risks	High
Trial bycatch reduction device options for T1 fishery to reduce bycatch of stout whiting	Reduce bycatch of stout whiting in the T1 fishery to reduce the level of fishing mortality on the stock and maximise fishery performance	Medium to high
Recommence age and length sampling of stout whiting	To include updated information in future stock assessments	Low to medium

Schedule of performance monitoring, assessment and review

Annual performance monitoring and assessment

The fishery's performance will be monitored against this harvest strategy **annually**. This will include an annual harvest strategy workshop to provide operational advice on the fishery's performance and any matters that may need addressing.

The primary performance measure is spawning biomass, which will be used to review the TACC every three years. In the intervening years, a review of standardised catch rate information will also inform fishery performance and if management action is required between scheduled stock assessments.

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 where 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 7: Schedule of performance monitoring, assessment and review

	Year 1	Year 2	Year 3	Year 4	Year 5
Assessment program	Modelled stock assessment	Standardised catch rate monitoring	Standardised catch rate monitoring	Modelled stock assessment	
Management program	Review TACC, reference points and fishing rules	Adjustment of TACC for standardised catch rate, if required	Adjustment of TACC for standardised catch rate, if required	Review TACC, reference points and fishing rules	Harvest strategy review

Harvest strategy review

This harvest strategy will remain in place for a period of five years, after which time it will be fully reviewed in accordance with the *Fisheries Act 1994*. The harvest strategy may also 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 a 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
- it is clear the strategy is not working effectively and the intent of the harvest strategy policy is not being met.

For more information on the processes for amending harvest strategies, refer to *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)
Biomass at maximum economic yield (B*mey*)	The average biomass which 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: • 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 (CPUE)	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
CTFFF	Commercial trawl fishery (fin fish)
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	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 sector
Total allowable commercial catch (TACC)	The harvest limit set for the commercial fishing sector usually achieved through setting TACC, but sometimes through input controls
WTO	Wildlife Trade Operation

Attachment 1: Data collection and validation plan

Purpose

This document provides a plan for the collection and validation of data from the Queensland commercial trawl fishery (fin fish) (CTFFF). The plan seeks to provide reliable, high-quality data to support stock assessments, ecological risk assessments (ERAs) and harvest strategies, and to meet the conditions of Wildlife Trade Operation accreditation provided under the *Environmental Protection and Biodiversity Conservation Act 1999*.

Accurate, reliable and timely data is one of the foundations of sustainable fisheries management. In particular, validation of collected fishing effort, catch and interactions with non-target species data is a critical element in ensuring management decisions are based on evidence and provide confidence to stakeholders.

Relationship with the harvest strategy

The CTFFF harvest strategy sets out objectives and decision rules for the sustainable management of the fishery. It establishes a framework for managing the fishery, including annual performance reviews and a process for adjusting management requirements (including improved data collection and validation) to support achieving the fishery objectives.

Ecological risk assessment recommendations

The current ERA was prepared for the CTFFF in 2019 and is available at fisheries.qld.gov.au.

The ERA found that current operation of the CTFFF does not represent a high risk to any target or non-target species groups. The ERA assigned intermediate risks to bycatch, excluding species of conservation concern, and to batoids (i.e. rays and wedgefish).

Recommendations from the ERA included:

- improving the level of information on catch compositions for elasmobranchs (e.g. batoids and sharks) and other non-target species, with particular emphasis on bycatch compositions and release fates
- a continued evaluation of the use of otter trawl and Danish seine nets in the CTFFF, the economic benefits/constraints of each method, and target species retention rates and their potential to impact on non-target species.

Environment Protection and Biodiversity Conservation Act 1999 accreditation

Part 13A

On 19 August 2020, the Queensland CTFFF was declared as an approved Wildlife Trade Operation, in accordance with subsection 303FN(2) and paragraph 303FN(10)(d) of the *Environmental Protection and Biodiversity Conservation Act 1999*, subject to conditions applied under section 303FT. Part 13A conditions provided to the Fisheries Queensland on the approved Wildlife Trade Operation declaration included Condition 4 and Condition 5 below:

Condition 4

By 30 March 2021 the Queensland Department of Agriculture and Fisheries must provide the Department of Agriculture, Water and the Environment with a Data Collection and Validation plan. The Plan must include milestones with clear deadlines for implementing an ongoing independent data collection and validation program in the Commercial Trawl (Fin Fish) Fishery as required in Condition 5.

Condition 5

By 31 December 2021 the Queensland Department of Agriculture and Fisheries must commence ongoing independent data collection and validation in the Commercial Trawl (Fin Fish) Fishery. The program must:

a) validate, with a high degree of confidence, target and non-target catch, effort and protected species interaction data collected by fishers.

b) ensure there is enough fishery dependent and fishery-independent data sources to ensure all stocks impacted by the fishery remain sustainable.

Performance of the program, including comparative analysis of fishery dependent and independent data sources must be included in annual reports provided to the Department of Agriculture, Water and the Environment (refer Condition 3).

Part 13

The management regime for the Queensland CTFFF was also accredited on 19 August 2020 under sections 208A, 222A, 245 and 265 of the *Environmental Protection and Biodiversity Conservation Act 1999,* for the purposes of Divisions 1, 2, 3 and 4 respectively of Part 13 of the Act. This accreditation was subject to conditions including Condition 1 and Condition 2 below:

Condition 1

By 30 March 2021 the Queensland Department of Agriculture and Fisheries must provide the Department of Agriculture, Water and the Environment with a Data Collection and Validation plan. The Plan must include milestones with clear deadlines for implementing an ongoing independent data collection and validation program in the Commercial Trawl (Fin Fish) Fishery as required in Part 13A Condition 5.

Condition 2

By 31 December 2021 the Queensland Department of Agriculture and Fisheries must commence ongoing independent data collection and validation in the Commercial Trawl (Fin Fish) Fishery. The program must:

a) validate, with a high degree of confidence, target and non-target catch, effort and protected species interaction data collected by fishers.

b) ensure there is enough fishery dependent and fishery-independent data sources to ensure all stocks impacted by the fishery remain sustainable.

Performance of the program, including comparative analysis of fishery dependent and independent data sources must be included in annual reports provided to the Department of Agriculture, Water and the Environment (refer Part 13A Condition 3).

Rationale for conditions

These conditions resulted from an assessment of the Queensland CTFFF conducted by the Commonwealth Department of Agriculture, Water and the Environment. The assessment is available at environment.gov.au.

The Commonwealth assessment concluded that fishers may not be accurately reporting the extent of their discarded catch and interactions with protected species. These conclusions resulted largely from the observation that there is no program to collect independent data or validate information reported in commercial logbooks, other than spatial information collected through vessel tracking.

The assessment also noted that:

- bycatch logbooks for the fishery were discontinued around 2010
- an independent fishery observer program for the fishery was discontinued in 2010
- there is limited capacity for licence holders to report discards in the fishery logbook currently in use
- the number of species reported in logbooks has fallen during the past five years
- the reported weight of discards has decreased
- no discards of stout whiting, or Syngnathids, have been reported since the fishery observer program was discontinued.

Data collection and validation program

Fisheries Queensland collects data relating to catch and effort for the CTFFF through daily fishing logbooks and real-time unload reporting in accordance with reporting requirements. Global positioning system (GPS) data is also collected for all commercial fishing vessels operating in the CTFFF through vessel tracking requirements.

Table 1: Types of data collected in the CTFFF

Data type	Data collection methods currently in place	Data collection methods in the future
Fishery-dependent data (self-reported)	• T4 logbooks • Real-time landing reports • Catch disposal records • Species of conservation interest logbooks	• Improved and standardised reporting requirements across all commercial fisheries • Revised and improved threatened, endangered and protected animal logbook for all commercial fisheries • Improved electronic methods of data collection (e.g. introduction of a commercial fishing app)
Fishery-dependent data (independent validation)	• Vessel tracking systems • Queensland Boating and Fisheries Patrol (QBFP) at-sea inspections • QBFP landing (unload) inspections	• Independent observations

Existing reporting requirements and data collection

Fisheries Queensland already collects a range of data for the CTFFF on retained catch (target species and by-product) and effort that supports sustainable management of the fishery. Historical fishery-dependent sampling has also provided age-and-length frequency data from the catch. Existing data collection and validation processes will continue.

Fishery-dependent data (self-reported)

Logbook data

Fishers are required to provide catch and effort information in daily logbooks. The logbook requires shot-by-shot information on fishing effort – start and finish times, latitude and longitude, time shot away or winched up, average fishing depth, gear type and boat activity – and catch – number of boxes of stout whiting, permitted species retained (kg), permitted species discarded (kg), other species discarded (kg). Logbook data has been collected since 1991 and is suitable for underpinning fishery management decisions.

Fishers are also required to record interactions with species of conservation interest in a separate dedicated logbook. At the time of the interaction, fishers are also required to report any interactions with marine mammals (whale, dolphin and dugong) or turtle to the Queensland Department of Environment and Science. Quarterly reports on species of conservation interest interactions across all commercial fisheries are made publicly available via QFISH.

Routine audits of all logbooks (catch, effort and species of conservation interest) are undertaken quarterly to ensure fishers are complying with reporting requirements. Non-compliance is addressed through infringement notices and suspension of primary commercial fishing licences.

Range checks are in place for the CTFFF to confirm that data is logical and acceptable for the fisheries database. This involves ensuring inaccurate data is excluded from the fisheries dataset (determined through an in-depth biological, geographical and operational knowledge) and that fishers are providing timely and accurate information through logbooks.

Real-time landing reporting

Fishers are required to report their intention to land regulated fisheries resources, including the exact number of boxes of fish on board and their intended landing location. Fishers are also required to report accurate catch weights at the point of unload. Real-time landing reports can be used by Fisheries Queensland to verify logbook reports of retained catch. This prior report function allows QBFP to intercept vessels at sea or at landing locations to undertake compliance checks and validate reported information.

Fishery-dependent data (independent validation)

Independent validation of fishing effort and catch – vessel tracking

Vessels operating in the CTFFF are required to have approved, operational vessel tracking units that poll every 15 minutes. The units provide near real-time location information to Fisheries Queensland to support compliance with fisheries regulations and provide information on fishing effort, including spatial distribution of fishing to support data validation and improved understanding of ecological risks from fishing.

Vessel tracking information is used to identify fishing days if no logbook return has been provided and allows QBFP to undertake investigations into reported or alleged non-compliance.

Independent validation of fishing catch – QBFP inspections

QBFP undertake a range of routine and intelligence-based at-sea and landing inspections to validate reported data and ensure compliance with fisheries regulations (e.g. closures, fishery areas, gear).

Improvements to data collection and validation

The purpose of these improvements is to ensure that data collected on bycatch and threatened, endangered and protected species interactions are reliable and sufficient to assess, monitor and manage the sustainability of the CTFFF and risk to non-target species.

Focus area 1: Improved reporting requirements and validation of catch

From 1 September 2021, legislative changes will ensure standard reporting requirements for commercial fisheries to improve the accuracy of catch and effort information. The main changes include requiring a pre-trip notice before a fishing operation starts, including the proposed landing place and requiring catch disposal records for all species subject to quotas.

Reporting of threatened, endangered and protected species interactions will be modernised through an improved logbook. This logbook will replace the current species of conservation interest logbook from 1 September 2021. The new logbook has been designed to align with standard terminology and practices used across fisheries management jurisdictions in Australia.

A new commercial fishing mobile application for the reporting of commercial fishing catch and effort is being developed to facilitate the implementation of new reporting requirements. The application will enable reporting of pre-trip notices, effort (days fishing), catch (estimated weight), prior landing reports (catch numbers), unload reports (accurate landed weight) and catch disposal records (distribution of catch post-harvest), as well as threatened, endangered and protected species interaction reporting.

Crosschecks will be undertaken by comparing multiple sources of information provided by fishers at different times and locations. These comparisons ensure consistency and accuracy of reporting, which contribute to data reliability. For example, comparisons will be made between the reported catch (estimated weight), prior landing report (catch numbers), unload report (accurate landed weight) and catch disposal record (distribution of catch post-harvest). Moderate and large discrepancies will be investigated to determine which of the two data sources is correct to improve data accuracy. Any non-compliance will be addressed through infringement notices and suspension of primary commercial fishing licences.

The improved reporting requirements will be in place by 1 September 2021.

Focus area 2: Independent validation of fishing effort – comparison of logbook and vessel tracking data

Routine crosschecks with information provided by fishers in logbooks and vessel tracking will be used to validate fishing location and effort. This information will validate that reported catch came from the location and time reported in the logbooks and ensure that information underpinning fisheries management decisions is accurate. Moderate and large discrepancies will be investigated to determine which of the two data sources is correct to improve data accuracy. Any non-compliance will be addressed through infringement notices and/or suspension of primary commercial fishing licences.

The independent validation of fishing effort will be in place by 31 December 2021.

Focus area 3: Independent validation of fishing activity

An independent observation sampling program for at-sea fishery monitoring will be used in the CTFFF to enable independent collection and validation of data on retained catch, bycatch and threatened, endangered and protected species interactions. This information will update understandings of ecological risk, validation of data and fisheries compliance.

A previous observer program for this fishery was in place between 2009 and 2010 with over 100 days coverage, and collected unbiased, accurate and broad catch, effort and bycatch information for the fishery, including species catch composition and catch rate for each gear type. This existing information will be used to inform an updated independent observation sampling program to commence in the 2022 fishing season.

The following milestones will ensure the independent sampling program is operational by 31 December 2021:

- Fisheries Queensland will draft an independent observation sampling program. This will involve analysing fishery catch and effort information (including number of shots) to determine percentage coverage proportionate to level of ecological risk from fishing. This coverage will consider the spatial and temporal distribution to the fishery to ensure observations reflect traditional fishing activity. Reporting requirements will be identified and, at a minimum, will include validation of retained catch, estimates of bycatch and species, and validation of threatened, endangered and protected species interactions.
- Fisheries Queensland will scope cost-effective independent observation options, including onboard observers or electronic monitoring (cameras). This will involve assessing existing processes and protocols, including data sheets, for overlap and suitability in the CTFFF. Fisheries Queensland will provide industry with a scope of work for independent observations sampling program options.
- Fisheries Queensland will seek written confirmation from industry that they will meet the agreed independent observation sampling program requirements, including financial impacts. Industry will engage a preferred service provider to deliver the agreed independent observation sampling program requirements. Initial discussions with industry have confirmed their in-principle agreement with these requirements.

The independent observation sampling program will be in place by 31 December 2021 and will cover one full season every three years. A report must be provided to Fisheries Queensland within three months of the end of the sampling year (i.e. full fishing season).

Focus area 4: Bycatch data collection

The ERA identified improving the level of information on catch compositions of elasmobranchs and other non-target species (bycatch) as key research priorities for the CTFFF. The independent observation sampling program will address collection of updated information on elasmobranch species composition and release fates.

At-sea observations for the stout whiting fishery and interactions with sharks and rays is available online. The most frequently occurring species included bluespotted maskray, common stingaree, eastern shovelnose ray, guitarfishes and weasel sharks. Independent observations will address updated information on interactions and release fates with key species.

Implementation of focus area 3 (independent validation of fishing activity) will deliver on this focus area. Updated information on interactions will also update understandings of ecological risks from fishing activities within the CTFFF.

Progress reporting

Annual performance reviews are built into the CTFFF harvest strategy schedule, including progress against data collection and validation activities. This will include reporting on the outcomes of validation and compliance actions.

Following commencement of the independent observations sampling program, Fisheries Queensland will provide a summary report to the Department of Agriculture, Water and the Environment in 2023 as part of the Wildlife Trade Operation reassessment process. Given the ecological risk profile for the CTFFF, the independent observations sampling program will be undertaken for one complete season every three years.

Table 1 (overleaf) outlines the key milestones for improvements to data collection and validation activities for the CTFFF.

Table 1: Plan for improvements to data collection and validation activities

Activity	2021				2022				2023				2024				2025				2026	
	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2
Existing data collection and validation																						
Improved reporting requirements																						
• Standardised reporting requirements																						
• Revised threatened, endangered and protected animal logbook																						
• Routine crosschecks between logbooks and unload reports																						
• Introduction of commercial fishing mobile device application for electronic catch and effort reporting, as well as prior reporting, accurate landed weights and catch disposal																						
Independent validation of fishing effort																						
• Routine crosschecks between vessel tracking and logbook reports																						
Independent validation of fishing activity																						
• Finalise independent observation sampling program for the CTFFF																						
• Finalise consultation with fishery working group on requirements for independent observation sampling program																						
• Confirmation from industry that they will enter into agreements to meet independent observation sampling program																						
• Independent observation sampling program finalised																						
• Commence independent observations at sea.																						
• Report on independent observation sampling program provided to Fisheries Queensland																						
• Fisheries Queensland to review reported information and provide to the Department of Agriculture, Water and the Environment																						