



Australian Government

**Department of Agriculture,
Water and the Environment**

Assessment of the Queensland Sea Cucumber Fishery (East Coast)

November 2021

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Disclaimer

This document is an assessment carried out by the Department of Agriculture, Water and the Environment of a commercial fishery against the Australian Government *Guidelines for the Ecologically Sustainable Management of Fisheries – 2nd Edition*. It forms part of the advice provided to the Minister for the Environment on the fishery in relation to decisions under Parts 13 and 13A of the *Environment Protection and Biodiversity Conservation Act 1999*. The views expressed do not necessarily reflect those of the Minister for the Environment or the Australian Government.

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EXECUTIVE SUMMARY

On 4 August 2021, the Queensland Department of Agriculture and Fisheries submitted an application for assessment of Queensland's Sea Cucumber Fishery (East Coast) (the fishery) to the Department of Agriculture, Water and the Environment under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as an approved Wildlife Trade Operation (WTO). This assessment was undertaken against the Australian Government 'Guidelines for the Ecologically Sustainable Management of Fisheries – 2nd Edition'. A public comment period was open from 5 August 2021 to 9 September 2021.

Fishery management arrangements

The fishery operates in Queensland and Commonwealth waters from Cape York to Tin Can Bay, including parts of the Great Barrier Reef Marine Park and the Coral Sea Marine Park. Harvest is by hand collection only and the fishery has been managed using limited entry with quota of 391 t, split between a 53 t quota for White Teatfish (*Holothuria fuscogilva*), 30 t quota for Black Teatfish (*Holothuria whitmaei*) and 308 t quota for 'other sea cucumbers'. There are also Rotational Harvest Arrangements (RHA) which divide the fishery into 158 zones, where each may be fished a maximum of 18 days every 3 years. An Ecological Risk Assessment (ERA) was completed in August 2021 and a Harvest Strategy was implemented on 1 September 2021.

Implementation of the Harvest Strategy is a positive development, formalising previously voluntary management measures from a Memorandum of Understanding (MoU) with industry. The Harvest Strategy also outlines the rules applied to the fishery and makes the management arrangements more transparent.

However, the department has noted some concerns in this assessment relating to the fishery's management arrangements. While the harvest strategy is an important step, some of the previous MoU measures (such as minimum size limits) were not transferred to the harvest strategy. These measures were part of the framework of input controls designed to ensure sustainable harvest in the fishery in the long term. The original framework was formally evaluated by CSIRO in 2014 through a Management Strategy Evaluation (MSE).

In addition, the harvest strategy biomass limit reference point for the exploitable biomass (i.e. the point where fishing mortality is set at zero to allow a stock to recover) is at 20% of the unfished biomass level. Acknowledging 20% is the default limit biomass for stock management in the absence of any further information, this level may not be conservative enough for sea cucumber species. For example, in the Torres Strait, the beche-de-mer harvest strategy biomass limit reference point is 40% of unfished biomass as 20% is considered too low, due in part to the "Allee" affect where there is low fertilisation success for sea cucumbers at low densities.

An MSE is a tool that scientists and managers use to test whether a fishery's management arrangements can achieve pre-agreed management objectives. MSEs help determine the harvest strategy likely to perform best. The best harvest strategy would perform well, regardless of uncertainty, and balance trade-offs amid competing management objectives. The department notes that the new management arrangements for the fishery should be tested in this manner.

Target stocks

Approximately 22 species of sea cucumbers have been harvested in the fishery. However, most of the recent harvest has been comprised of Burrowing Blackfish (*Actinopyga spinea*), White Teatfish (*Holothuria fuscogilva*), Black Teatfish (*Holothuria whitmaei*), Prickly Redfish (*Thelenota ananas*), Curryfish (*Stichopus hermanni*, *Stichopus vastus*), and Blackfish (*Actinopyga palauensis*).

White Teatfish and Black Teatfish were listed on Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) at the 18th Conference of the Parties meeting (17-28 August 2019). The listing came into effect on 28 August 2020. The department's assessment forms the basis for approvals granted under Parts 13 and 13A of the EPBC Act, and for the Australian CITES Scientific Authority's Non-Detriment Findings (NDF) for Black Teatfish and White Teatfish in this fishery.

A stock assessment has been completed for White Teatfish. While the assessment indicates a favourable stock status, uncertainty remains due to the lack of biomass surveys for this species and critical assumptions made in the stock assessment. A feasibility study completed to meet a condition of the 2020 WTO declaration for the fishery defined ways to effectively survey the fishery. The Harvest Strategy for the fishery indicates industry will survey the fishery in 2023–24. Further, an independent study to assess the population and demography of sea cucumbers on the Great Barrier Reef (GBR) is due to begin in 2022 and run for three years. A further survey of the neighbouring Coral Sea region is planned for 2022 and will improve understanding of the population of this species. As such, the department expects that uncertainty in the estimation of population status for this species will be reduced over the next three years. The department notes the White Teatfish stock assessment completed in 2021 requires peer-review.

There is currently insufficient evidence of a clear recovery of Black Teatfish to demonstrate that ongoing harvest would not be detrimental to the stock status of the species. While industry has led surveys in the fishery and a stock assessment has been prepared using this information, the level of uncertainty remains high. The department notes that the Black Teatfish stock assessment completed in 2021 also requires peer-review.

The department is also concerned about the lack of stock assessments and comprehensive and representative fishery independent surveys for other species targeted by the fishery and has recommended conditions to help further this work.

Impacts on ecosystems and protected species

The fishery is highly targeted, with fishing limited to hand collection. Impacts to protected species are likely to be low and limited to interactions while anchoring and moving between locations. The highly selective fishing practices also limit potential impacts on the marine ecosystem. Sea cucumbers are members of marine benthic communities that play important ecosystem functions. Of the more than 70 species commercially exploited, at least 12 regularly burrow into sand and mud, playing major roles in bioturbation. Some are deposit-feeders, reducing the organic load and redistributing surface sediments, making them bioremediators for nutrient runoff. Sea cucumbers excrete inorganic nitrogen and phosphorus, enhancing the productivity of benthic biota. This form of nutrient recycling is crucial in ecosystems such as coral reefs. Feeding and excretion by sea cucumbers also acts to increase seawater alkalinity which contributes to local buffering of ocean acidification.

Ecosystem-based fisheries management needs to consider the importance of sea cucumbers in marine ecosystems and implement regulatory measures to safeguard their ecological roles. While it is unclear whether the Queensland Department of Agriculture and Fisheries (QDAF) directly monitors ecosystem impacts from sea cucumber fishing, the department's assessment has determined that significant ecological impacts are unlikely with QDAF's current management arrangements.

Public submissions

The department received a total of 12 public comments as part of the public consultation process. These included 2 comments from industry, 3 from Non-Government Organisations (NGO), and 7 from academics and scientific experts on sea cucumbers. While the industry comments highlighted the stewardship and innovation in the fishery, comments from NGOs and scientists warned of the intrinsic vulnerability of sea cucumbers and their low capacity to recover from overharvesting. These comments recommended not granting export approval for White Teatfish or Black Teatfish, indicating that management arrangements are not meeting Australia's obligations under CITES, and are not conducive to the aims of the Reef 2050 Long Term Sustainability Plan. Scientific experts raised concerns about the lack of adequate stock status information and inconsistent, inadequate and uncertain survey data, particularly for Black Teatfish. There were also concerns raised about the concentration of harvest in specific areas of the fishery despite the RHA only allowing harvest for a limited time in each zone of the fishery every three years.

Conclusion

The department's assessment identified a range of concerns that relate to a high level of uncertainty in the information that underpins the management of harvest for some of the key species in the fishery.

Noting the important role sea cucumbers play in the ecosystem, their vulnerability to overharvesting, and limited capacity to recover from population decline, this assessment report details a number of conditions for the WTO declaration for the fishery to improve the ecological sustainability of the management arrangements. The conditions require a more precautionary approach to management of the risks in the fishery.

The department recommends declaring the fishery an approved WTO for a period of three years until 30 November 2024 subject to the conditions outlined in section 2. The department also recommends including the fishery on the List of Exempt Native Specimens (LENS) while a WTO approval is in place and accrediting the management arrangements under Part 13 of the EPBC Act.

SECTION 1: ASSESSMENT SUMMARY

Guidelines assessment	Meets	Partially meets	Does not meet	Details
Management regime *1 of 9 criteria is not applicable	1 of 8	7 of 8		The fishery's management arrangements are documented but some details are not publicly available. Stakeholder engagement is focused on the members of the fishery's working group. Fisheries information/data should be made publicly available, particularly when harvesting species listed under international conventions such as CITES. Questions were raised about the adequacy of consultation with key stakeholders. Management of the fishery is strategic. However, there is considerable uncertainty surrounding the biological basis and appropriateness of management controls and harvest limits. There are also concerns about the enforceability of key aspects of the management framework.
Principle 1 (target stocks) *3 of 11 criteria are not applicable		9 of 9		Harvest data is collected in logbooks and there are vessel monitoring systems in place in the fishery but there is currently no independent observer or other data validation program. The assessment has identified concerns regarding the stock assessment for Black Teatfish and White Teatfish. No stock assessments have been prepared for other species and there is limited information on the biological basis for harvest limits of these species. There are reference limits in place but there is serious concern over the appropriateness of the 20% biomass limit for managing sea cucumber stocks.
Principle 2 (bycatch and TEPS) *8 of 12 criteria are not applicable	4 of 4			Given the highly selective hand-collection methods used by this fishery, there are negligible risks to bycatch and very low risk to protected species. An Ecological Risk Assessment has been completed and considered the risk to bycatch and protected species as negligible to low.
Principle 2 (ecosystem impacts)		2 of 5	3 of 5	There is no active monitoring of ecosystem impacts for the fishery. Sea cucumbers play an important role in the ecosystem and further work is required to determine whether the level of harvest is consistent with the abundance of each species and their role in the ecosystem.
EPBC requirements	Meets	Partially meets	Does not meet	Details
Part 12	Meets			This assessment considered the fishery's impact on marine bioregional areas and has found the risk to be low and acceptable.

Part 13	Meets			This assessment considered the fishery's impact on protected species and ecological communities and has found the risk to be low and acceptable.
Part 13A	Meets			The management of the fishery has been assessed and found to have shortcoming in the understanding of the status of stocks in the fishery. With QDAF's agreement to implementing the conditions outlined in Section 2 of this report, management measures are likely to be adequate.
Part 16	Meets			Management arrangements were found to be moderately precautionary. With QDAF's agreement to implementing the conditions outlined in Section 2 of this report, management measures are likely to be adequate.

SECTION 2: SUMMARY OF ISSUES REQUIRING CONDITIONS

Issue	Condition
<p>General Management</p> <p>Export decisions relate to the management arrangements in force at the time of any decision(s) made under the EPBC Act. To ensure that the decision(s) remain valid and export approval continues uninterrupted, the Department of Agriculture, Water and the Environment (the department) needs to be advised of any changes that are made to the management regime and make an assessment that the new arrangements are equivalent or better, in terms of ecological sustainability, than those in place at the time of the original decision(s). This includes operational and legislated amendments that may affect the sustainability of the target species or negatively impact on byproduct, bycatch, EPBC Act protected species or the ecosystem.</p>	<p>Condition 1</p> <p>The Queensland Department of Agriculture and Fisheries must ensure that operation of the Queensland Sea Cucumber Fishery (East Coast) is carried out in accordance with management regime specified in Queensland Department of Agriculture and Fisheries, and Great Barrier Reef Marine Park Authority issued permits, as well as in the following:</p> <ul style="list-style-type: none"> • <i>Fisheries Act 1994</i> (Qld) • Fisheries (General) Regulation 2019 (Qld) • Fisheries (Commercial Fisheries) Regulation 2019 (Qld) • Fisheries Declaration 2019 (Qld) • Fisheries Quota Declaration 2019 (Qld) • <i>Marine Parks Act 2004</i> (Qld) • Marine Parks Regulations 2019 (Qld) • <i>Great Barrier Reef Marine Park Act 1975</i> (Cth) • Great Barrier Reef Marine Park Regulations 2019 (Cth). <p>Condition 2</p> <p>The Queensland Department of Agriculture and Fisheries must inform the Department of Agriculture, Water and the Environment of any intended material changes to the Queensland Sea Cucumber Fishery (East Coast) management arrangements that may affect the assessment against which <i>Environment Protection and Biodiversity Conservation Act 1999</i> decisions are made.</p> <p>Condition 3</p> <p>The Queensland Department of Agriculture and Fisheries must inform the Department of Agriculture, Water and the Environment of any intended changes to fisheries legislation that may affect the legislative instruments relevant to this approval.</p>
<p>Annual Reporting</p> <p>It is important that the Queensland Department of Agriculture and Fisheries produce and present reports to the department in order for the performance of the fishery and progress in implementing the conditions described in this report</p>	<p>Condition 4</p> <p>The Queensland Department of Agriculture and Fisheries must provide annual reports on the Queensland Sea Cucumber Fishery (East Coast) to the Department of Agriculture, Water and the Environment every 12 months, from</p>

Issue	Condition
<p>and other managerial commitments to be monitored and assessed throughout the life of the export approval. An application for re-accreditation should follow Appendix B to the '<i>Guidelines for the Ecologically Sustainable Management of Fisheries – 2nd Edition</i>' and include a description of the fishery, management arrangements in place, research and monitoring outcomes, recent catch data for all sectors of the fishery, status of target stock, interactions with EPBC Act protected species, impacts of the fishery on the ecosystem in which it operates and progress in implementing the department's conditions described in the previous assessment for the fishery. Electronic copies of the guidelines are available from the Department's website at: http://www.environment.gov.au/resource/guidelines-ecologically-sustainable-management-fisheries.</p>	<p>the date of the approval of the Wildlife Trade Operation (WTO). These reports must be consistent with Appendix B of the <i>Guidelines for the Ecologically Sustainable Management of Fisheries – 2nd Edition</i>.</p>

Management under the Harvest Strategy

Implementation of the Harvest Strategy is a positive development, formalising management measures that were previously voluntary under a Memorandum of Understanding (MoU) with industry. The Harvest Strategy also outlines in one document the rules applied to the fishery and makes the management arrangements more transparent.

The Harvest Strategy details that for tier 1 stocks, (White Teatfish and Burrowing Blackfish) performance indicators and sustainable harvests for all sectors will be estimated using a stock assessment. The aim is to measure the capability for the stock to attain the target biomass level (Btarg 60% of unfished biomass), at which point the harvest strategy will be considered as meeting its fishery objectives.

The decision rules for setting a sustainable harvest in the harvest strategy are based on a 'hockey stick' approach. This is where the total allowable catch (TAC) is set based on a linear relationship between limit biomass level (Blim), where the level of fishing mortality is equal to zero, and Btarg, where the exploitation rate and TAC are set to achieve the maximum economic yield. The decision rules consider the current biomass level of the stock for determining the TAC to achieve the Btarg. As such, estimating the exploitable biomass level for tier 1 species to a high degree of confidence is greatly important for the operation of the harvest strategy.

The recommended TAC is calculated by applying the rate of fishing mortality to achieve Btarg to the current exploitable biomass level. As a result, the recommended TAC represents the total catch that can be harvested in the following years to move the current biomass level towards the target level.

If the spawning biomass of a stock falls below Blim, targeted fishing of the stock must cease, and a rebuilding strategy be developed to rebuild the spawning biomass above Blim within a biologically reasonable timeframe (e.g. based on mean generation time), as required by the Queensland Harvest Strategy Policy.

While the harvest strategy is an important step forward, some of the measures previously contained in the MoU have not been transferred to the harvest

Condition 5

The Queensland Department of Agriculture and Fisheries must commission a Management Strategy Evaluation (MSE) to evaluate the ability of the settings contained in the '*Queensland Sea cucumber fishery harvest strategy 2021–2026*' and any other legislated and enforceable management arrangements to meet the fishery's objectives of attaining maximum economic yield (defined in the harvest strategy as target biomass level of 60% of unfished biomass for stocks harvested in the fishery). The MSE must consider the risk posed to each individual species harvested in the fishery, identify information needs and make recommendations for any improvements to the management arrangements considered necessary for the management of the fishery to meet its objective.

- a) The scope and Terms of Reference for this review should be developed in consultation with the Department of Agriculture, Water and the Environment.
- b) The updated MSE must include all new data, including data from fishery independent surveys. The updated MSE must be published on the Queensland Department of Agriculture and Fisheries website, alongside the Harvest Strategy for the fishery by no later than the commencement of the 2023–24 fishing season.
- c) The outcomes of the MSE must be considered as part of an implementation plan to be provided to the Department of Agriculture, Water and the Environment by no later than six months before the end of the WTO. Any required changes to management of the fishery must also be implemented by that time.

Issue	Condition
<p>strategy, and these measures formed part of the framework of input controls that had previously been found to have a high chance of ensuring that harvest in this fishery was sustainable in the long term. The original framework was formally evaluated in 2014 through a Management Strategy Evaluation (MSE).</p> <p>In addition, the harvest strategy has set a biomass limit reference point for the exploitable biomass (i.e. the point at which fishing mortality is set at zero) at 20% of the unfished biomass level. Acknowledging that 20% is the default limit biomass for stock management in the absence of any further information, this level may not be conservative enough for sea cucumber species. For example, in the Torres Strait, the beche-de-mer harvest strategy biomass limit reference point was set at 40% of unfished biomass.</p> <p>A Management Strategy Evaluation or MSE is a tool that scientists and managers can use to simulate the workings of a fishery's system and allow them to test whether the management arrangements can achieve pre-agreed management objectives. In so doing, an MSE helps to determine the harvest strategy likely to perform best. That best harvest strategy would perform well, regardless of uncertainty, and balance trade-offs amid competing management objectives.</p> <p>In 2014, through a Project of the Fisheries Research and Development Corporation, the CSIRO carried out an MSE to evaluate the benefits of a rotational harvest strategy (the Rotational Zoning Scheme subsequently referred to in this document as Rotational Harvest Arrangements – RHAs) then utilised in this fishery (Skewes et al 2014). The MSE considered the RHAs in the context of the other management arrangements applied to the fishery at the time, including fishing limits within zones, minimum size limits, and total allowable catches (TACs) for some high-value species.</p> <p>The findings of the 2014 MSE supported the decision to grant the short-term Wildlife Trade Operation (WTO) approval for the fishery in 2020, while more information was gathered on the stock status of CITES-listed target species.</p>	<p>Condition 6</p> <p>The Queensland Department of Agriculture and Fisheries must:</p> <ul style="list-style-type: none"> a) Undertake desktop research on the main sea cucumber species harvested in the fishery to determine biologically meaningful minimum size limits. Investigations should consider key biological parameters, for example, size at maturity. Findings of this research should be published on the Queensland Department of Agriculture and Fisheries website before the commencement of the 2022–23 fishing season. b) Work with industry to undertake fieldwork within the fishery to determine appropriate ways to implement the minimum size limits determined through 6a. This may include the development of appropriate conversion factors to account for changes in size resulting from processing. Findings of this research should be published on the Queensland Department of Agriculture and Fisheries website before the commencement of the 2023–24 fishing season. c) Implement minimum size limits based on work completed in 6a and 6b prior to the 2024–25 fishing season. Implementation of minimum size limits should be described in the Queensland Department of Agriculture and Fisheries application for the next WTO for this fishery.

Issue	Condition
<p>However, some of the changes in management arrangements brought in by the implementation of a new Harvest Strategy in 2021 present some concerns in relation to whether the MSE's conclusions remain relevant. In particular:</p> <ul style="list-style-type: none"> • The MSE found that effectiveness of RHAs broke down when individual zones are heavily targeted. The recent feasibility study into a stock assessment for White Teatfish indicated that around 80% of harvest of White Teatfish since the 2010–11 season has occurred in just 34 of 158 harvest zones and nearly 25% of harvest came from just one RHA. Spatial harvest data are not available for analysis of whether this trend is occurring for other species targeted in the fishery. This is a departure for the lowest risk scenario modelled in the MSE where harvest was distributed evenly throughout the fishery. • The MSE evaluated the RHAs based on a limit of 15 days fishing effort per harvest zone. The submission and Harvest Strategy indicate that RHAs now allow up to 18 days per zone. This is potentially a substantial (20%+) increase in effort days, a significant change to this parameter. • The MSE also considered the broader management framework applied to the harvest, concluding that RHAs together with fishing limits within zones, minimum size limits, and TACs for some high-value species would reduce the risk of localised and overall overexploitation. Importantly there was an assumption that no animals were harvested younger than the minimum size limit. Therefore, the removal of minimum size limits across all species of sea cucumbers is another significant shift from the original framework. Acknowledging the plasticity of form in sea cucumbers, minimum size limit is a common measure applied to the management of sea cucumber fisheries. Provided they are chosen appropriately, and fishers comply with regulations, they have been found to be an effective measure in allowing protection of some individuals and spawning biomass which will then become available after a period of growth. • The MSE was based on fishing patterns of 2012, the fishery has changed over the years, new species have been added to the harvest and new information has been collected on species (i.e., new surveys). Together, these changes make the 2014 MSE less relevant in evaluating the current management framework. 	

Issue	Condition
<ul style="list-style-type: none"> • The 2014 MSE model also did not include positive density dependence for fertilisation success, which at the time was already hypothesised to be responsible for population crashes and slow recovery for sea cucumber fisheries but there was little information available for modelling these effects. • Industry stewardship has been an important factor in the management approach taken in this fishery. While voluntary measures and stewardship are a nimbler and at times more effective way of ensuring compliance, alone it does not future proof management measures against changes in the industry composition. To do so, it is important that management arrangements are based on clear and enforceable measures. Having included some elements from the MoU into the Harvest Strategy for the fishery has already gone some way towards that. <p>Further, the 2015 MSE made four recommendations to improve the management of the fishery into the future.</p> <p>Recommendations included:</p> <ol style="list-style-type: none"> 1. Maintain, strengthen and develop the (then) current Rotational Zoning Scheme (RZS) in the ECBDMF. Consider increasing rotational periodicity and a wider spread of fished zones as this is likely to reduce further the risk of localised depletion and improve the overall sustainability of the fishery. 2. Address important information gaps for higher risk species such as Burrowing Blackfish and White Teatfish, including the distribution and density of Burrowing Blackfish outside the fished zones, and the density of White Teatfish throughout the fishery. 3. Address important information gaps that will increase model certainty and hence the robustness of management recommendations; especially size/age at maturity, growth and natural mortality of targeted sea cucumber species. 4. Apply MSE approach to any new species in the ECBDMF that exceed the trigger limits implemented for the fishery. 	

Issue	Condition
It does not appear these recommendations were progressed. While not progressing the recommendations from the 2014 MSE will possibly make a new MSE less powerful than it would have been otherwise, the changes in the management settings for the fishery do support a need for the revised MSE.	

Burrowing Blackfish (*Actinopyga spinea*)

Burrowing Blackfish currently makes up approximately half of the total harvest in the fishery and has made up the largest component of the fishery since the mid-2000s. This species is managed outside of the Rotational Harvest Arrangement (RHAs). Instead, there are declared Burrowing Blackfish Zones (BFZs), areas identified in industry-led surveys as having high abundance. Harvest limits are set for each zone and continuous fishing is permitted. There is however a 15 t allowance for harvest from outside the BFZs and from the RZS area.

The 2014 MSE that reviewed the rotational harvest strategy of the fishery concluded that Burrowing Blackfish was at the highest risk of depletion of any species in the fishery and would benefit from being included in RZS. The report also noted the need to better understand the distribution and density of Burrowing Blackfish outside the fished zoned as well as the need to collect reliable abundance data within the fished zones. These recommendations have not been followed.

Surveys for Burrowing Blackfish have been conducted at Gould Reef with the most recent having taken place in 2019. Changes in survey methodology between historic surveys and the most recent survey prevent direct comparison capable of detecting trends from sustained fishing pressure and make it hard to establish the longer-term sustainability of the harvest.

Further, while the findings of the 2019 survey can be used to support a 25 t TAC for Gould Reef, it is unclear how these surveys support the 45 t TAC for Gould Reef under the recently implemented Harvest Strategy. Gould Reef has the lowest TAC of all the BFZs.

The Lizard Island/Waining Reef BFZ has a TAC of 120 t and was surveyed 16 years ago in 2005, prior to the commencement of targeted harvesting of Burrowing Blackfish in the area. This survey identified high abundance of the species but made the following recommendations:

- A fine-scale system of management should be devised for the burrowing blackfish resource to allow for the spreading of effort within each patch.
- Further biological research needs to be conducted to enable the development of a spatially relevant stock productivity model.
- Investigation should be carried out to determine whether any benefits exist in the use of video assessments for the burrowing blackfish stock.

Condition 7

The Queensland Department of Agriculture and Fisheries must:

- a) Ensure data from fishery independent surveys of Burrowing Blackfish at the Lizard, Gould and Bunker Reef Burrowing Blackfish Zones are representative of the fishery and used to inform a stock assessment for the species.
- b) Undertake and publish the stock assessment for Burrowing Blackfish. The stock assessment must be independently peer reviewed and must be completed by no later than six months prior to the expiry of the WTO approval.
- c) For the 2024–25 fishing season and beyond, implement any necessary changes to the total allowable catch (TAC) to ensure that rate of fishing mortality does not exceed that required to achieve the biomass target of 60% of unfished biomass for this species as detailed in the harvest strategy for the fishery.

Issue	Condition
<ul style="list-style-type: none"> • More survey work needs to be conducted to quantify the extent of the stock in this area including the stock extending into the Green Zone of the Great Barrier Reef Marine Park. <p>There is no evidence that further survey work has been undertaken either to quantify the stock in the area or to monitor the impact of 16 years of sustained fishing pressure in the area.</p> <p>Bunker Reef has a TAC of 60 t and there is no information on biomass estimates to support the TAC for this BFZ.</p>	

Curryfish (*Stichopus herrmanni*, *S. vastus*, and *S. ocellatus*) and Prickly Redfish (*Thelenota ananas*)

Prickly Redfish and Curryfish make up a significant portion of the overall harvest in the fishery (approximately 20%). There is very limited information on the abundance of either species in the GBR.

Prickly Redfish is listed as 'endangered' by the International Union for Conservation of Nature (IUCN) Red List. The Harvest Strategy outlines a 40 t trigger reference level for the harvest of this species. However, there does not appear to be a biological basis for this trigger level.

There are two species of Curryfish reported to be harvested in the fishery: *Stichopus herrmanni* and *S. vastus*. Each species has trigger reference level under the Harvest Strategy, but recent logbook reporting does not differentiate the species making those trigger reference levels less meaningful. Expert advice received through the department's public consultation process also noted that there is a third species (*S. ocellatus*) that occurs in the fishery and may be harvested but this is not known as reporting is not done to species level.

S. vastus is listed as 'least concern' on the IUCN Red List and there is a 25 t trigger reference level for this species in the fishery. *S. herrmanni* is listed as 'vulnerable' on the IUCN Red List and has a trigger reference level of 50 t.

Before 2008, Curryfish were not heavily fished as there were significant challenges with quality during processing. Since then, its proportional harvest has grown as processing methods for this species have improved (Skewes *et al* 2014), making it a relatively recent addition to the fishery. Processing has been known to have potentially large amounts of wastage in other fisheries and it is unknown whether this is an issue for this fishery as this information is not collected or accounted for in harvest reporting.

The 2014 MSE modelled the abundance of *S. herrmanni* as 2.8 individuals per hectare citing surveys conducted from 1998–2000. However, it noted that surveys reported a density estimate of zero in the northern part of the reef. The abundance of *S. vastus* was inferred from the fishery reporting at an approximate catch composition of 2/3 *S. herrmanni* to 1/3 *S. vastus*.

Condition 8

The Queensland Department of Agriculture and Fisheries must:

- a) Implement species-specific reporting for Curryfish for the 2022–23 fishing season and beyond.
- b) Undertake and publish stock assessments for Prickly Redfish and Curryfish that incorporate fishery independent surveys, that are representative of the fishery, for these species. The stock assessment must be independently peer reviewed and must be completed no later than six months prior to the expiry of the WTO approval.
- c) For the 2024–25 fishing season and beyond, use information from 8a and 8b above to determine and implement the appropriate level of fishing mortality rate to be applied to these species to achieve the 60% biomass target as detailed under decision rule 3.2 of the harvest strategy for this fishery.

Issue	Condition
<p>The Level 1 Ecological Risk Assessment (ERA) for the fishery identified several information gaps and recommended consideration of the need to conduct sustainability assessments for target species not managed under species-specific quotas (<i>i.e.</i>, Prickly Redfish, Curryfish). The ERA suggests that based on the results of these assessments, the suitability or applicability of managing their take under species-specific TAC limits should be examined, the department will be interested in considering this at the next assessment for this fishery.</p> <p>The patchy distribution, low abundance and uncertain catch composition of these species warrant a precautionary approach to their management. The IUCN listing of these species comes from identified declines because of fishing pressure internationally. While these species are not listed under Australian legislation or CITES, the knowledge of their vulnerability to fishing pressure and the absence of any recent information on their abundance in the GBR calls for a better understanding of these species, their level of abundance and ability to sustain fishing pressure at current levels.</p>	

White Teatfish (*Holothuria fuscogilva*)

Australia is a Party to the Convention on International Trade in Endangered Species (CITES). CITES is a binding international agreement, which was ratified by Australia in 1976. The purpose of CITES is to prevent international trade from driving unsustainable population decline in species listed on the Convention's three appendices.

There are three levels of CITES listing:

- Appendix I – for species threatened with extinction.
- Appendix II – for species not currently threatened with extinction, but which may become so if harvest is not carefully controlled. CITES allows some limited international trade of these species under very tight rules and controls. CITES permits are required for all exports of Appendix II species.
- Appendix III – for species that may be threatened locally within certain countries.

White Teatfish is listed on Appendix II of CITES. CITES requires the exporting Party's Scientific Authority to make a positive non-detriment finding (NDF) prior to export of CITES specimens listed in Appendix I and II. Australia's CITES Scientific Authority is in the Sustainable Fisheries Section of the Wildlife Trade Office in the Department of Agriculture, Water and the Environment.

A positive NDF is made when "*the sum of all harvests is sustainable in that it does not result in unplanned range reduction, or long-term population decline, or otherwise change the population in a way that might be expected to lead to the species being eligible for inclusion in Appendix I*".

To ensure that fisheries declared as approved Wildlife Trade Operations (WTO) under the EPBC Act continue to be able to trade internationally in CITES-listed marine species, NDFs need to be based on a level of information that meets international standards, consistent with guidance agreed by resolution by CITES Parties (https://cites.org/sites/default/files/document/E-Res-16-07-R17_0.pdf).

Consistent with Resolution Conf. 16.7 Rev CoP 17, Australia's CITES Scientific Authority undertakes a risk-based approach to the information requirements for

Condition 9

The Queensland Department of Agriculture and Fisheries must:

- a) Ensure that harvest of White Teatfish (*Holothuria fuscogilva*) does not exceed 53 t per season.

Issue	Condition
<p>making NDFs. Under this approach, the level of information required to inform a NDF will vary depending on the biological vulnerability of the species, its global and national status, the risks posed to the species, and the degree of certainty associated with these factors.</p> <p>The department notes the positive progress made to better understand the stocks of this species in the fishery, including the design of a population survey for White Teatfish and a modelled stock assessment for the species, all published in 2021.</p> <p>The stock assessment for White Teatfish was undertaken as part of meeting the requirements of the previous WTO approval for the fishery. The stock assessment estimated the exploitable biomass for this species as being at 76% of the virgin biomass (virgin biomass presumed by the assessment to be the biomass level in 1995 and estimated from catch rates) (QDAF 2021a). However, the modelled recruitment in the stock assessment appears to continue to decline despite the high modelled biomass level. A continuous decline in recruitment is a sign of concern and may show that something is impairing recruitment, which is difficult to reconcile against an estimated population biomass of around 76%. While recruitment impairment may be external to fishing pressure on the stock, the long-term viability of the species in the GBR and the role fishing pressure might play on this, may need to be further investigated pending a peer review of the stock assessment.</p> <p>A White Teatfish TAC of 127 t (increased to 158 t for 1 season) was introduced in 1999. This quota has been reduced over the years, due mainly to concerns about the sustainability of the catch and the loss of fishing areas through GBRMP zoning, to 64 t. In 2011 the TAC was reduced to 53 t and the TAC currently remains at 53 t.</p> <p>The stock assessment also relies on Catch Per Unit Effort data as this is the only information available for the management of harvest for this species at this point. There is currently no fishery independent information available in the area of the fishery and no other relevant fishery-independent survey was included in the</p>	

Issue	Condition
<p>modelling for this species in the GBR (the Torres Strait and the Coral Sea regions have both had fishery independent surveys undertaken).</p> <p>As acknowledged in the stock assessment report, there are known limitations with using Catch Per Unit Effort measures as an index of relative abundance for sea cucumbers due to issues of hyperstability in effort, which could indicate that effort data does not reflect declining abundance of stocks. Further, the observed population decline in the neighbouring Coral Sea region following years of intense exploitation by both legal and illegal harvest (Skewes 2017) creates further uncertainty in relation to the dynamics of this stock.</p> <p>We note that industry has prepared a feasibility study to undertake a fishery-independent survey as required under the previous WTO approval for the fishery with the work possibly being carried out in the near future. We further note that the Great Barrier Reef Foundation has commissioned fishery-independent surveys of sea cucumbers in the GBR and as such there is an opportunity for collaboration to significantly improve the knowledge of this species in the GBR in the very near future.</p> <p>Expert advice received through the public consultation period associated with this assessment cautioned that sea cucumbers' ability to repopulate an area of depleted stock from other parts of the fishery may be limited. There are significant knowledge gaps surrounding the structure of White Teatfish stock in the fishery and while there is limited information on the spatial distribution of harvest, there is evidence to suggest that highly concentrated harvest is occurring despite the RHAs system, which may conceivably be because of natural distribution rather than lack of adherence to the RHAs. There is insufficient information to determine if localised depletion is occurring. However, the MSE required under condition 5 of this WTO will address this concern. The 2014 MSE made a series of recommendations in relation to the future management of this species. There is no evidence of these recommendations having been followed and consideration of their relevance now will be considered by the MSE under Condition 5.</p>	

Harvest from the Coral Sea Marine Park

The fishery operates in areas of the Coral Sea Marine Park including Ashmore and Boot Reefs, Marion Reef and Saumarez Reef. The Coral Sea region does not have export approval for White Teatfish due to concerns over depletion of stock and the lack of information to support a sustainable TAC. It is concerning that harvest from the Queensland Sea Cucumber Fishery (East Coast) is possibly occurring from this same stock also in the absence of information to support a sustainable TAC. Of particular concern is the harvest data showing that nearly 10% of the quota for White Teatfish was harvested from Ashmore and Boot Reefs in the 2011–12 and 2017–18 fishing seasons. Managers of the Coral Sea Marine Park have expressed concerns about the capacity of individual reefs in the park to sustain the levels of fishing pressure outlined in the Rotational Harvest Arrangements. Changes in harvest reporting are required to better understand the proportion of harvest of all species coming from the Coral Sea Marine Park.

Also, changes to zoning in the Coral Sea Marine Park, in particular Marion Reef, have closed some areas that were previously accessed by the fishery. It is unclear whether management has been adapted to appropriately acknowledge the reduced area open to fishing.

A survey by Skews in 2017 reported low densities of White Teatfish throughout the study area of the Coral Sea Marine Park. This species was particularly scarce on the southern reefs and was not seen at all on Saumarez Reef or Wreck Reef. This survey was not specifically designed to quantify the abundance or biomass of White Teatfish. There have been no other surveys with more targeted methodologies to better understand this region. If new information comes to light from White Teatfish surveys in the Coral Sea, the Australian CITES Scientific Authority would welcome an opportunity to review that information and assess whether a positive non-detriment finding could be made for harvest of this species in the Coral Sea region.

Questions have also been raised about the level of consultation undertaken with the traditional owners of the sea country that includes Ashmore and Boot Reefs. The *Guidelines for the Ecologically Sustainable Management of Fisheries – 2nd Edition* assess whether the management regime has been developed through a

Condition 10

The Queensland Department of Agriculture and Fisheries must:

- a) Report information on the species harvested from Ashmore and Boot Reefs, Marion Reef and Saumarez Reef including species harvested, amount of harvest per species and location of harvest from the Coral Sea Marine Park. This reporting must be done as part of the annual report required under Condition 4.
- b) Ensure that White Teatfish (*Holothuria fuscogilva*) is not harvested from the Coral Sea Marine Park including Ashmore and Boot Reefs, Marion Reef and Saumarez Reef.

Issue	Condition
<p>consultative process which includes all interested and affected parties. DAWE notes the need for continual engagement with Indigenous people from the region when management changes are being considered or made. DAWE also notes the working group for this fishery includes a position for an “Indigenous Representative” however this position appears to be vacant.</p>	

SECTION 3: DETAILED ANALYSIS AGAINST THE GUIDELINES

Guidelines criteria	Comment
THE MANAGEMENT REGIME	
The management regime does not have to be a formal statutory fishery management plan as such and may include non-statutory management arrangements or management policies and programs. The regime should:	
Be documented, publicly available and transparent.	<p>Partially Meets – Management arrangements are documented and publicly available, but the publicly available annual report is not up to date.</p> <p>The management arrangements for the Queensland Sea Cucumber Fishery (East Coast) are outlined on the QDAF website at: https://www.business.qld.gov.au/industries/farms-fishing-forestry/fisheries/fisheries-profiles/commercial-harvest-fisheries/sea-cucumber.</p> <p>Legal requirements are contained in publicly available legislation: the <i>Fisheries Act 1994</i> (Qld), Fisheries (General) Regulation 2019 (Qld), Fisheries (Commercial Fisheries) Regulation 2019 (Qld), Fisheries Declaration 2019 (Qld), Fisheries Quota Declaration 2019 (Qld), <i>Marine Parks Act 2004</i> (Qld), Marine Parks Regulations 2019 (Qld), <i>Great Barrier Reef Marine Park Act 1975</i> (Cth) and Great Barrier Reef Marine Park Regulations 2019 (Cth). Permits issued by the Queensland Department of Agriculture and Fisheries (QDAF), and the Great Barrier Reef Marine Park Authority (GBRMPA) afford access to fish in the fishery.</p> <p>A Harvest Strategy for the fishery was implemented on 1 September 2021 and is published online (see key links at end of this document). An Ecological Risk Assessment (ERA) for the fishery and stock assessments for Black Teatfish and White Teatfish were also recently completed and published on the Queensland government’s e-Research Archive (see key links at end of this document).</p> <p>Annual reporting is an important aspect of the transparent operation of the fishery. Annual reports for the fishery have not been updated since the 2018–19 season. Public comments noted the difficulty finding up to date information on the fishery as well as information that underpins the management of key target species.</p>

<p>Be developed through a consultative process providing opportunity to all interested and affected parties, including the general public.</p>	<p>Partially Meets – Consultation has been undertaken with some stakeholders on parts of the management of the fishery.</p> <p>The management arrangements for the fishery have been developed in consultation with industry and other stakeholders. Where there have been substantive management changes, such as the introduction of the harvest strategy for the fishery, draft documents have been published for public consultation.</p> <p>There is a stakeholder advisory body for the fishery, the Queensland Sea Cucumber Working Group, which is made up of industry, researchers, representatives from the Great Barrier Reef Marine Park Authority (GBRMPA), and an Indigenous representative although this position is currently listed as vacant.</p> <p>The fishery operates in areas including the Great Barrier Reef Marine Park and the Coral Sea Marine Park. Agencies with responsibilities for managing both marine parks have expressed concern with the management of harvest from their respective marine parks.</p>
<p>Ensure that a range of expertise and community interests are involved in individual fishery management committees and during the stock assessment process.</p>	<p>Partially Meets – Stock assessments were developed without consulting crucial stakeholders.</p> <p>The fishery engages a range of expertise and industry through the fishery working group. The group is made up of fisheries managers, researchers, representatives from the GBRMPA, industry and an indigenous representative (although this position has been marked as vacant). The harvest strategy and ERA were developed in conjunction with the working group and the harvest strategy was published online for public comment.</p> <p>The recent stock assessments for Black Teatfish and White Teatfish were prepared by QDAF without external consultation and review, noting that time constraints applied in order to meet conditions of the previous approval for this fishery. During the public consultation period of this assessment, a number of submissions were received from sea cucumber experts expressing concerns about the appropriateness of surveys and analysis that support the current stock assessments.</p> <p>There are currently no stock assessments for any species in the ‘other sea cucumber’ quota category that makes up the majority of the fishery by volume.</p>

Be strategic, containing objectives and performance criteria by which the effectiveness of the management arrangements are measured.

Partially meets – Has objectives and performance criteria however there is insufficient information on stocks for these measures to be effective.

Substantial management changes commenced in the fishery on 1 September 2021, with the implementation of the *Queensland sea cucumber fishery harvest strategy: 2021-2026* (Harvest Strategy). The Harvest Strategy formalised much of the management that was in place under the MoU but some aspects of the former management of the fishery were modified or removed.

The Harvest Strategy outlines a range of performance measures for the management of target stocks, assessment of ecological risks and consideration of social and economic indicators. Target stocks in the fishery are categorised into tier 1 and tier 2 species. Tier 1 species are Black Teatfish (*Holothuria whitmaei*), White Teatfish (*H. fuscogilva*) and Burrowing Blackfish (*Actinopyga spinea*). For these species there is a biomass target in place for target stocks set at 60% of unfished biomass. There is also a biomass limit in place of 20% of unfished biomass, which if reached would lead to cessation of harvest. While this approach is a positive improvement in the strategic management of the fishery, there are concerns about the stock assessments used to determine the current biomass of each stock and the appropriateness of the 20% biomass limit.

The biomass target of 60% and biomass limit of 20% of unfished biomass reflect the default in the Queensland and Commonwealth Fisheries Harvest Strategy Policies. However, the policies recognise that an appropriate biomass limit may vary between species due to biological characteristics. For the Torres Strait Beche-de-mer Fishery, the Harvest Strategy uses a biomass limit of 40% unfished biomass recognising the density dependent reproductive biology of sea cucumbers requires a more precautionary limit. The Torres Strait Beche-de-mer Fishery is managed by the Protected Zone Joint Authority which comprises the Qld and Commonwealth ministers with responsibility for fisheries and the Chairperson of the Torres Strait Regional Authority. It is unclear why the more recently implemented Harvest Strategy in the fishery includes a biomass limit that is less precautionary given these fisheries operate in close proximity and target many of the same species (and potentially the same stocks).

Stock assessments have recently been completed for Black Teatfish and White Teatfish. The stock assessment for White Teatfish indicated a modelled exploitable biomass of 76% of unfished levels. Concerns have been raised about the accuracy of the assessment as it is based on catch data rather than survey data. There are potential issues acknowledged in the report of Catch Per Unit Effort not necessarily reflecting changes in the abundance of stocks and no surveys of White Teatfish have been completed in the fishery.

The stock assessment for Black Teatfish indicated the stock is between 40-42% of unfished biomass. Harvest of Black Teatfish resumed in 2019 after a 20-year closure due concerns that the stock was depleted. There have been multiple surveys including in 1999, 2015 and 2020 which have all used different methodologies and surveyed different areas. If the population estimate from 1999 (indicating stocks at 45% unfished biomass) is compared to the stock assessment model (indicating stocks at 40-42% unfished biomass), there is no apparent recovery despite 20 years of no fishing. While this comparison may be simplistic as the two estimates relate to different periods and use very different methodologies, this is the best information available at this time. This information

raises questions about any recovery following the long term Black Teatfish closure and may indicate that stocks were depleted to a critical level prior to 1999. While there is considerable uncertainty regarding survey data inputs there is not enough evidence to support a positive Non-Detriment Finding for Black Teatfish. Stock assessment peer-reviews and further surveys providing new data may provide more certainty on stock status allowing a decision to be made about potential future harvest of Black Teatfish.

There is currently no stock assessment in place for Burrowing Blackfish, despite this species making up the approximately half the total harvest in the fishery by weight. It is unclear how a biomass-based performance measure could effectively be applied to Burrowing Blackfish.

Tier 2 species are managed under species specific Total Allowable Catch (TAC) harvest trigger limits. There are no biomass estimates to confirm whether these TACs represent sustainable levels of harvest. The Harvest Strategy indicates that stock status, length frequency distributions, standardised commercial catch rates and total harvest will also be considered in assessing whether stocks are being managed appropriately. The Harvest Strategy mentions that it aims to maintain these species at their target biomass (maximum economic yield or 60% unfished biomass) but the reference limits for these species are not linked to biological indicators such as exploitable biomass.

The harvest strategy indicates ecological risks are identified during ERAs. Any issues identified with elevated risk scores are brought forward for review and investigation. The investigations consider the reason for elevated risk and may recommend appropriate management action to reduce the risk. There is also a management measure where, in the event of a reef health incident (coral bleaching, cyclones etc.), management action can be put in place following a review led by the Great Barrier Reef Marine Park Authority. Sea cucumbers play an important ecological role in the greater reef ecosystem, cycling nutrients and maintaining the health and productivity of sediment habitats. It is concerning that there is no process to monitor or detect ecosystem impacts from the removal of sea cucumbers.

Social and economic indicators are considered through stated objectives and indicators. These centre around maximising the profitability of the commercial harvest sector through managing for maximum economic yield and monitoring the broader social and economic benefits of the fishery to the community.

Be capable of controlling the level of harvest in the fishery using input and/or output controls.

Partially meets – There are input and output controls in the fishery, but the effectiveness of these measures is uncertain particularly for species without individual quota limits.

The fishery is managed with output controls, in the form of legislated quota limits and species specific Total Allowable Catch (TAC), and input controls including limited entry and Rotational Harvest Arrangements (RHAs) which is led by industry and indicates how much time a fisher can spend in a given zone of the fishery.

There are three legislated quota categories: Black Teatfish (30 t), White Teatfish (53 t) and 'other sea cucumber' (308 t). The 'other sea cucumber' quota category is comprised of more than 20 species. However, Burrowing Blackfish makes up the majority of this quota category. The harvest strategy outlines a number of trigger reference levels for species within this quota category but these levels are not enforceable limits on harvest (the reference point at which harvest would stop is 20% of the exploitable virgin biomass but no biomass surveys are planned for any of these species). While the industry historically has shown a strong commitment to voluntary compliance, trigger limits in the 'other sea cucumber' quota category are not legislated harvest limits. This means that, theoretically, the entire 308 t quota could be taken as one species in a season (excluding the three species for which quota is legislated).

Under the RHAs the fishery is divided into 158 zones which are open for an 18-day period every three-year cycle. A Management Strategy Evaluation (MSE) of RHAs, was conducted in 2014 and found that the RHA system was likely to be effective in reducing the risk of depletion to a low level for most target species. The findings of the MSE were based on the management of the fishery in 2014. With the implementation of the new Harvest Strategy there are changes in the management arrangements for the fishery which may have significant implications for the MSE findings. When the MSE was conducted in 2014 fishing effort was restricted to 15 days every three years. The Harvest Strategy allows 18 days fishing per rotation zone every 3 years, which could represent a near 20% increase in harvest effort. The minimum size limit for each species was factored into the MSE modelling. Minimum size limits are currently not enforced or built into the formal management arrangements in the fishery.

The MSE also noted that risk of depletion increases if harvest effort is not evenly distributed throughout the fishery despite operating in accordance with the RHAs. Spatial harvest patterns have emerged showing that 80% of recent harvest of White Teatfish has occurred in just 34 of 158 zones. Further, nearly 25% of harvest of this species occurred in just one harvest zone. It is not clear whether a three-year rotation would allow sufficient time for stocks to recover under this harvest concentration. Spatial harvest data is not regularly reported in this fishery, the information on the spatial harvest of White Teatfish only came to light through the publication of the report on the feasibility of undertaking a biomass survey for this species. It is therefore unknown whether equally concerning spatial harvest trends are occurring for other species in the fishery.

Contain the means of enforcing critical aspects of the management arrangements.

Partially meets – The fishery includes enforceable quota limits for some species but the largest component of the fishery is managed by species limits which are not enforceable.

The fishery included three quota categories which constitute clearly enforceable management arrangements. Quota categories are:

- Black Teatfish – 30 t
- White Teatfish – 53 t
- other sea cucumber – 308 t.

Fishers must submit trip and landing notifications as well as report catch of all species. All catch must be landed to authorised fish receivers ('Beche-de-mer Buyers'), who verify landed catch weights and report their data independently to QDAF

The 'other sea cucumber' quota category includes multiple species with individual harvest reference limits. These limits are not hard limits that would result in a cessation of fishing for that species, rather, if reached a management response would be triggered. Burrowing Blackfish is listed as a Tier 1 species in the Harvest Strategy but is managed in the 308 t basket quota 'other sea cucumbers'. It is not clear how effectively the 60% biomass target nor the 20% biomass limit can be managed or enforced while this species is managed in the 'other sea cucumber' quota category.

RHAs were previously a voluntary management arrangement under the MoU. The Harvest Strategy implemented on 1 September 2021 has formalised the RHAs in the management of the fishery. The fishery relies on the RHAs as a management strategy to minimise risk of overfishing species which have not been considered in a stock assessment (the majority of species taken in the fishery). Despite being a critical aspect of the management of the fishery, RHA arrangements have changed over the years and it is not clear how the RHAs are enforced. QDAF has indicated that VMS was historically used to validate compliance with the RHAs.

The 2014 MSE, which indicated the effectiveness of the RHAs in reducing risk of overfishing, was undertaken when there was a minimum size limit in place for each species harvested in the fishery. Updates to the management of the fishery under the Harvest Strategy no longer include minimum size limits. QDAF has indicated that this is due to sea cucumber's size plasticity making a minimum size limit impossible to enforce.

As detailed in Purcell 2010, a principal use of size limits in sea cucumber fisheries is to protect juveniles and recently matured adults to allow individuals one or more seasons to spawn before they can be fished. Minimum size limits must therefore have some biological basis corresponding to size at which individuals first become mature plus some additional buffer so they have time to contribute to spawning. Fisheries managers may also want to set minimum size limits on (dried) beche-de-mer of different species, so that fishers and processors can maximise the export income for each individual removed from the stock. Large sea cucumbers are generally placed in a higher grade for export and fetch higher prices.

	<p>Conditions 6 has been put in place and requires an investigation of meaningful and implementable minimum size limits.</p>
<p>Provide for the periodic review of the performance of the fishery management arrangements and the management strategies, objectives and criteria.</p>	<p>Meets – Regular performance reviews are built into management.</p> <p>The implementation of a Harvest Strategy for the fishery represents a significant update on the management of the fishery. The harvest strategy has been developed to manage the fishery until 2026, after which point it will be reviewed. There are also provisions in the harvest strategy to allow for earlier review under the following circumstances:</p> <ul style="list-style-type: none"> • New information that substantially changes the status of the fishery, leading to improved estimates of indicators relative to reference points. • Drivers external to the management of the fishery increase the risk to fish stock/s. • It is clear the harvest strategy is not working effectively and the intent of the <i>Queensland Harvest Strategy Policy</i> is not being met. <p>The harvest strategy also includes a schedule of performance monitoring, assessment and review. This outlines time frames for regular monitoring and review of catch and effort data, reviews of TACs, and stock assessments and biomass surveys.</p> <p>Biomass based management of tier 1 species requires a stock assessment to determine whether harvest levels are appropriate. Stock assessments of Black Teatfish and White Teatfish were a condition of the 2020 WTO. However, there is no stock assessment in place for Burrowing Blackfish. While there is a harvest reference limit for the species it is not clearly linked to a biomass level of the stock. Condition 7 requires a stock assessment for Burrowing Blackfish by the beginning of the 2024–25 fishing season. Condition 8 requires stock assessments for two tier 2 species, the Curryfish species group and Prickly Redfish, stock assessments are to be based on information that includes fishery independent surveys.</p>

<p>Be capable of assessing, monitoring and avoiding, remedying or mitigating any adverse impacts on the wider marine ecosystem in which the target species lives and the fishery operates.</p>	<p>Partially meets – Limited capability to manage impacts of the removal of sea cucumber species on wider marine ecosystem.</p> <p>A Level 1 ERA has been conducted for the fishery which considered risks to the wider marine environment. Risks to marine habitats and ecosystem processes were assessed as low and low/intermediate and not progressed to a further higher level ERA.</p> <p>The ERA acknowledges the key role of sea cucumbers play in benthic ecosystems. Despite acknowledging this, the management of the fishery does not identify any indicators which could be used to monitor potential ecosystem impacts from the removal of sea cucumbers from the reef by this fishery. The management arrangements assume that harvest limits in the fishery would mitigate impacts on the wider ecosystem. The validity of this assumption is unclear given many of these harvest limits are not based on biomass surveys and stocks have not been assessed for many species.</p> <p>Of particular concern is the potential impact of Burrowing Blackfish harvest. This species makes up approximately half the volume of harvest in the fishery and only occurs in restricted areas. Public comments have raised concerns about the level of harvest, indicating they may already have impacted on the sediment ecosystems that Burrowing Blackfish inhabits. Condition 7 of this assessment is aimed at gaining a better understanding of the population status for this species.</p>
<p>Requires compliance with relevant threat abatement plans, recovery plans, the National Policy on Fisheries Bycatch, and bycatch action strategies developed under the policy.</p>	<p>Not Applicable</p> <p>No stocks are required to comply with threat abatement plans, recovery plans of bycatch strategies.</p>

PRINCIPLE 1 - A fishery must be conducted in a manner that does not lead to over-fishing, or for those stocks that are over-fished, the fishery must be conducted such that there is a high degree of probability the stock(s) will recover.

Objective 1 - The fishery shall be conducted at catch levels that maintain ecologically viable stock levels at an agreed point or range, with acceptable levels of probability.

Information requirements

1.1.1 There is a reliable information collection system in place appropriate to the scale of the fishery. The level of data collection should be based upon an appropriate mix of fishery independent and dependent research and monitoring.

Partially meets – There is logbook reporting and sporadic industry-led surveys are undertaken in the fishery. There is no independent verification of fishery data and no research and monitoring plan. However, a trigger system is outlined in the new harvest strategy for the fishery.

The fishery has mandatory logbook reporting of catch and effort. Fishers are required to give prior notice of where they intend to land their catch as well as complete the logbook entry prior to unloading. Logbooks report catch to species level for all species, with the exception of Curryfish. Conditions 7 and 8 include requirements to undertake stock assessments that are based on all available data, including survey data. Condition 8 requires species specific reporting for Curryfish.

The fishery has a strong history of industry led initiatives such as surveys and voluntary management measures. However, there has been no independent observer coverage to verify catch reporting. The industry reports zero wastage or discards but processing occurs at sea and so verification of this information is not currently possible.

Assessment

1.1.2 There is a robust assessment of the dynamics and status of the species/fishery and periodic review of the process and the data collected. Assessment should include a process to identify any reduction in biological diversity and/or reproductive capacity. Review should take place at regular intervals but at least every three years.

Partially meets – Stock assessments are prepared from some species in the fishery.

Stock assessments have been prepared for two of the tier 1 species listed in the Harvest Strategy (Black Teatfish and White Teatfish). Despite also being a tier 1 species and managed with a biomass target and limit, there is no stock assessment for Burrowing Blackfish. None of the tier 2 species have undergone a stock assessment. These are instead managed by individual species TAC limits. These limits are not based on biological data.

There are concerns about the stock assessments for Black Teatfish and White Teatfish. The stock assessment for Black Teatfish is based on a combination of CPUE data and survey information. There are concerns about the interpretation of survey data for Black Teatfish and whether it is representative of stocks across the reef. There was considerable variability within and between survey locations leading to very high standard deviation in estimates of average density. The recent stock assessment indicated that stocks were at 40-42% of unfished biomass. Previous work undertaken when the TAC for Black Teatfish was reduced to zero, estimated stocks to be around 45% unfished biomass. Survey location and methodology is not comparable between historic and more recent surveys. However, there is no conclusive evidence showing stock recover despite nearly 20 years of no harvest.

The stock assessment for White Teatfish indicated the current stock is at 76-78% of the unfished biomass. The stock assessment is based on CPUE data from logbooks, as no biomass surveys have been conducted. There are concerns the stock assessment didn't adequately account for hyperstability of CPUE. The species is sedentary and highly vulnerable to hand harvesting. Fishers could rapidly identify whether there are sufficient numbers of White Teatfish at a site before spending time fishing. Therefore, the assumption that catch rates are a clear indication of abundance may warrant further consideration. Comments from expert scientists also indicated that there is uncertainty in the biological understanding of White Teatfish (e.g., growth rates, size at maturity). The accuracy of data used in the stock assessment model may also warrant further consideration.

1.1.3 The distribution and spatial structure of the stock(s) has been established and factored into management responses.

Partially meets – Some spatial information is collected but spatial structure of stocks has not been established. The information that has been collected is used in stock assessments and for management.

Logbook reporting includes spatial information on which rotational zones are fished and there is a Vessel Monitoring System (VMS) in place in the fishery. This information is primarily used for understanding compliance and there is limited evidence of VMS data being used to understand finer scale spatial harvest patterns which could offer insights into the stock structure.

There is considerable uncertainty regarding the stock status and spatial structure of Black Teatfish in the fishery. Surveys for Black Teatfish have occurred in 1999, 2015 and 2021. However, surveys occurred in different areas on each occasion and did not use consistent methodology. As a result, comparisons through time are difficult to make. The most recent survey from 2021 was used as a data input for the stock assessment model. This survey was undertaken in the southern part of the fishery in the area that was formerly known as 'Zone 2' (Koopman and Knuckey 2021). The survey covered a limited area of 26 reefs and showed high variability in stock density. CPUE data was also used extensively in the stock assessment.

The surveys from both 1999 and 2015 both occurred in the northern area of the fishery (Benzie and Uthicke 2003, Knuckey and Koopman 2016). In 1999, densities in fished areas (in the northern zone) were about 25% of those in protected areas. Overall stock biomass was estimated to be 45% of unfished biomass. The 2015 survey used different methodology and primarily sampled different areas from 1999. Only eight survey sites overlapped with earlier research that prompted the fishery's closure. Only four reefs showed increases in Black Teatfish densities, two remained similar, and two declined, one by 63%. The 2015 survey took place in the northern zone and was used as rationale for opening the whole fishery, including the southern zone which was not previously fished.

There have also been surveys for Burrowing Blackfish within the declared Burrowing Blackfish Zones (BFZ). There is currently no stock assessment for Burrowing Blackfish and the distribution of the species is not well known. Burrowing Blackfish is only known to occur at commercially viable densities in the three BFZs, at Lizard, Gould and Bunker reefs. The uncertainty regarding the distribution of Burrowing Blackfish presents challenges to monitoring the impacts of fishery on the stock as there are no known areas of habitat for Burrowing Blackfish outside the BFZs.

Spatial distribution and stock structure is unknown for species harvested in this fishery. Management under the RHA was found by the 2014 MSE (Skewes et al 2014) to have reduce the risk of depletion of target species. The MSE indicated that if single rotational zones experience sustained high levels of harvest the effectiveness of the RHAs would be diminished. The recently published feasibility study for biomass surveys for White Teatfish indicated that 80% of harvest occurred in just 35 of 158 rotational zones. It is unclear what impact this harvest trend may have on the distribution and structure of stock.

	<p>Similar analysis of spatial harvest information has not been undertaken for other species in the fishery and it is unclear to what extent harvest may be concentrated in a subset of rotational zones.</p>
<p>1.1.4 There are reliable estimates of all removals, including commercial (landings and discards), recreational and indigenous, from the fished stock. These estimates have been factored into stock assessments and target species catch levels.</p>	<p>Partially meets – Estimates of commercial landings are available but there is no information on discards (or wastage from processing at sea), recreational or indigenous harvest.</p> <p>There is compulsory logbook reporting of catch and effort for most species in the fishery. While there is no independent observer program, fishers are required to notify QDAF in advance of landing their catch to allow for inspection.</p> <p>There are two species of Curryfish harvested in the fishery: <i>Stichopus herrmanni</i> and <i>S. vastus</i>. The Harvest Strategy includes TAC reference limits for each species, 25 t for <i>S. vastus</i> and 50 t for <i>S. herrmanni</i>. Recent logbook reporting does not differentiate the species making those reference limits less meaningful. Expert advice received by the department noted a third species (<i>S. ocellatus</i>) that occurs in the fishery and may already be harvested but in unknown volumes due to the lack of species-specific reporting for this species group. Curryfish catches increased rapidly at an average annual pace of 200% from 2007 to 2011. These increases occurred in the absence of baseline studies, independent resource assessments, or other information required to determine fishery impacts (Eriksson, 2015).</p> <p>The level of recreational harvest of sea cucumbers is expected to be low as most harvest of these species are aimed at the export market. The ERA indicates recreational harvest is calculated from “infrequent voluntary fisher surveys” and surveys since 2009 have not included recreational harvest of sea cucumbers. However, there are limits in place on the harvest of sea cucumbers by recreational fishers including:</p> <ul style="list-style-type: none"> • Qld waters south from Bowen are closed to recreational harvest. • Gear restrictions limit the use of underwater breathing apparatus. • Possession limits of 5 individuals (10 per boat). • Black Teatfish and White Teatfish are no-take species. <p>While there is insufficient information to quantify recreational harvest, the above restrictions are likely to ensure it is small compared with the commercial sector.</p> <p>Indigenous harvest of sea cucumber species has not been calculated.</p>

1.1.5 There is a sound estimate of the potential productivity of the fished stock/s and the proportion that could be harvested.

Partially meets – Stock assessment models have been prepared for two of the tier 1 species, productivity is currently estimated for other species.

Stock assessment models have been prepared for Black Teatfish and White Teatfish. They have modelled population dynamics, growth and recruitment. Scientific experts and government authorities have raised concerns about the accuracy of biological parameters in the models suggesting the species may be much slower growing and later maturing than previously thought.

The stock assessment reports note several key assumptions and limitations which may affect accuracy of outputs. The biological parameters used in the stock assessment models are based on information that the author considered to be 'decades old'. Information such as growth, mortality, size at maturity are important components of the stock assessment. A review of this information may highlight more up to date science which could improve the accuracy of the stock assessment.

The stock assessments also assume stocks protected in the green zones of the Great Barrier Reef Marine Park support higher recruitment in areas open to fishing. The stock assessments indicate this assumption 'may warrant further investigation'. The extent that sea cucumber stocks function as a single population or sub-populations is uncertain and further review of this assumption may further improve the accuracy of stock assessments.

The White Teatfish stock assessment report notes that sea cucumbers are sedentary species highly vulnerable to hand harvest fishing. It highlights the possibility of hyperstability 'masking trending in abundance'. The stock assessment report does not describe how hyperstability has been controlled, or if it has been controlled, in the assessment. The stock assessment should be reviewed to better understand the potential impacts of hyperstability on modelled outputs.

Considerable uncertainties about historic fishing effort and what constitutes virgin biomass were highlighted, particularly for Black Teatfish. This is compounded by issues with biomass survey data which may not be comparable through time, due to differing survey methods. Further, historic fishing pressure could have potentially depleted stocks to the point where reproductive success and stock recovery is compromised. Burrowing Blackfish makes up approximately half of the fishery by weight. The 2014 MSE indicated that Burrowing Blackfish was at the highest risk of depletion of all species in the fishery due to its restricted distribution and relatively high fishing mortality as well as being managed outside of the RHAs in declared BFZs which are open to continual harvest. Burrowing Blackfish is the only tier 1 species with no stock assessment. In addition to undertaking a stock assessment, collecting distribution and density data from unfished areas would improve knowledge about the potential productivity of this species.

Management responses

1.1.6 There are reference points (target and/or limit), that trigger management actions including a biological bottom line and/or a catch or effort upper limit beyond which the stock should not be taken.

Partially meets – Reference points are in place for some species in the fishery. However, the biomass limit reference point may be inappropriate for sea cucumbers.

Sea cucumber species are highly vulnerable to overfishing and are known to have density dependent spawning success. Overfishing can reduce stocks below a threshold where recovery becomes extremely slow or impossible. The harvest strategy for this fishery included a target reference point of 60% and limit reference point of 20% of unfished biomass. The Commonwealth Fisheries Harvest Strategy Policy, recommends:

“Where information to support selection of a stock-specific limit reference point is not available, a proxy of 0.2 times unfished biomass should be used. In all cases, the species’ role in the proper functioning of the marine ecosystem should be considered and the limit reference point must be no less than 0.2 times unfished biomass.” (DAWR 2018)

The Torres Strait Beche-de-mer Fishery, which QDAF is part of the joint management, uses a limit reference point of 40% noting the need for a more precautionary approach for managing sea cucumbers due to density dependent spawning success and vulnerability to fishing. The Torres Strait fishery harvests many of the same species and may share stocks with the fishery. There is no evidence to suggest that stocks in this fishery are less vulnerable to fishing or why a 20% limit reference point is more appropriate in this fishery.

Tied 2 species are managed by individual TAC reference limits. The harvest strategy includes a decision rule whereby if the TAC limit for a species is reached then a review of the TAC will be triggered to determine the appropriate level of fishing to achieve a 60% biomass target. The department understands this review would be undertaken in conjunction with the fishery working group.

1.1.7 There are management strategies in place capable of controlling the level of take.

Partially meets – Quota limits are in place for target species, noting the fishery has a ‘basket’ allowable take for several species. RHAs are in place but not actively monitored.

There are quota limits for Burrowing Blackfish, Black Teatfish and White Teatfish, as well as ‘other sea cucumber’. The ‘other sea cucumber’ basket quota is divided into species-specific trigger limits for most species. While quota limits are enforceable, trigger limits under the ‘other sea cucumbers’ do not represent firm limits for stopping fishing.

For species without stock assessments to inform management, the RHAs help protect against depletion. The RHAs were originally an industry initiative and historic monitoring of VMS data indicated a high degree of compliance. QDAF has confirmed there isn’t currently a formal program in place to review VMS data to ensure the fishery is adhering to the time limits and spatial restrictions outlined in the RHAs.

<p>1.1.8 Fishing is conducted in a manner that does not threaten stocks of byproduct species.</p>	<p>Partially Meets – Quota limits are in place for target species, noting the fishery has a ‘basket’ allowable take for several species.</p> <p>There are quota limits for Burrowing Blackfish, Black Teatfish and White Teatfish, as well as ‘other sea cucumber’. The ‘other sea cucumber’ basket quota is divided into species-specific trigger limits for most species. While quota limits are enforceable, trigger limits under the ‘other sea cucumbers’ do not represent firm limits for stopping fishing.</p> <p>For species without stock assessments to inform management, the RHAs help protect against depletion. The RHAs were originally an industry initiative and historic monitoring of VMS data indicated a high degree of compliance. QDAF has confirmed there isn’t currently a formal program in place to review VMS data to ensure the fishery is adhering to time limits and spatial restrictions outlined in the RHAs.</p>
<p>(Guidelines 1.1.1 to 1.1.7 should be applied to byproduct species to an appropriate level)</p>	
<p>1.1.9 The management response, considering uncertainties in the assessment and precautionary management actions, has a high chance of achieving the objective.</p>	<p>Partially Meets – Quota limits for target species are in place, noting the fishery has a ‘basket’ allowable take for several species.</p> <p>There are quota limits for Burrowing Blackfish, Black Teatfish and White Teatfish, as well as ‘other sea cucumber’. The ‘other sea cucumber’ basket quota is divided into species-specific trigger limits for most species. While quota limits are enforceable, trigger limits under the ‘other sea cucumbers’ do not represent firm limits for stopping fishing.</p> <p>For species without stock assessments to inform management, the RHAs help protect against depletion. The RHAs were originally an industry initiative and historic monitoring of VMS data indicated a high degree of compliance. QDAF has confirmed there isn’t currently a formal program in place to review VMS data to ensure the fishery is adhering to time limits and spatial restrictions outlined in the RHAs.</p>
<p>If overfished, go to Objective 2: If not overfished, go to PRINCIPLE 2:</p>	
<p>Objective 2 - Where the fished stock(s) are below a defined reference point, the fishery will be managed to promote recovery to ecologically viable stock levels within nominated timeframes.</p>	
<p>Management responses</p>	
<p>1.2.1 A precautionary recovery strategy is in place specifying management actions, or staged management responses, which are linked to reference points. The recovery strategy should apply until the stock recovers, and should aim for recovery within a specific time period appropriate to the biology of the stock.</p>	<p>Not applicable. No stocks are identified as overfished requiring a recovery strategy.</p>

<p>1.2.2 If the stock is estimated as being at or below the biological and/or effort bottom line, management responses such as a zero targeted catch, temporary fishery closure or a 'whole of fishery' effort or quota reduction are implemented.</p>	<p>Not applicable. No stocks are identified as overfished requiring a recovery strategy. For tier 1 species there is a biomass limit in place to stop fishing if the stock is reduced to 20% of unfished biomass and target limit set at 60% unfished biomass.</p>
<p>PRINCIPLE 2 - Fishing operations should be managed to minimise their impact on the structure, productivity, function and biological diversity of the ecosystem.</p>	
<p>Objective 1 - The fishery is conducted in a manner that does not threaten bycatch species.</p>	
<p>Information requirements</p>	
<p>2.1.1 Reliable information, appropriate to the scale of the fishery, is collected on the composition and abundance of bycatch.</p>	<p>Not Applicable. Fishing is highly targeted hand collection. Bycatch is unlikely to occur.</p>
<p>Assessment</p>	
<p>2.1.2 There is a risk analysis of the bycatch with respect to its vulnerability to fishing.</p>	<p>Not Applicable. Fishing is highly targeted hand collection. Bycatch is unlikely to occur.</p>
<p>Management responses</p>	
<p>2.1.3 Measures are in place to avoid capture and mortality of bycatch species unless it is determined that the level of catch is sustainable (except in relation to endangered, threatened or protected species). Steps must be taken to develop suitable technology if none is available.</p>	<p>Not Applicable. Fishing is highly targeted hand collection. Bycatch is unlikely to occur.</p>
<p>2.1.4 An indicator group of bycatch species is monitored.</p>	<p>Not Applicable. Fishing is highly targeted hand collection. Bycatch is unlikely to occur.</p>
<p>2.1.5 There are decision rules that trigger additional management measures when there are significant perturbations in the indicator species numbers.</p>	<p>Not Applicable. Fishing is highly targeted hand collection. Bycatch is unlikely to occur.</p>

<p>2.1.6 The management response, considering uncertainties in the assessment and precautionary management actions, has a high chance of achieving the objective.</p>	<p>Not Applicable. Fishing is highly targeted hand collection. Bycatch is unlikely to occur.</p>
<p>Objective 2 - The fishery is conducted in a manner that avoids mortality of, or injuries to, endangered, threatened or protected species and avoids or minimises impacts on threatened ecological communities.</p>	
<p>Information requirements</p>	
<p>2.2.1 Reliable information is collected on the interaction with endangered, threatened or protected species and threatened ecological communities.</p>	<p>Meets – Up-to-date logbooks are required which include records of interactions with endangered, threatened or protected species. Interactions with endangered, threatened and protected species must be reported in logbooks. Due to the highly selective nature of the harvest, the risk of interactions with these species is likely to be low and limited to interaction such as vessel strike while in transit. While interactions are unlikely, there is no program of independent observer coverage in the fishery.</p>
<p>Assessments</p>	
<p>2.2.2 There is an assessment of the impact of the fishery on endangered, threatened or protected species.</p>	<p>Meets – There is an assessment of the fishery’s impact on endangered, threatened and protected species. There is an ecological risk assessment (ERA) for the fishery which assessed the risk to endangered, threatened and protected species as negligible to low.</p>
<p>2.2.3 There is an assessment of the impact of the fishery on threatened ecological communities.</p>	<p>Not Applicable. There are no threatened ecological communities within the area of the fishery.</p>
<p>Management responses</p>	
<p>2.2.4 There are measures in place to avoid capture and/or mortality of endangered, threatened or protected species.</p>	<p>Meets – There is a mitigation strategy in place to avoid interactions with protected species. Fishers are required to report endangered, threatened or protected species interactions in logbooks. The fishery employs highly selective fishing practices and the risk of these species being captured or killed is minimal. Reporting interactions is considered an adequate measure here.</p>
<p>2.2.5 There are measures in place to avoid impact on threatened ecological communities.</p>	<p>Not Applicable. There are no threatened ecological communities within the area of the fishery.</p>

<p>2.2.6 The management response, considering uncertainties in the assessment and precautionary management actions, has a high chance of achieving the objective.</p>	<p>Meets – The management response has a high chance achieving the objective. The fishery employs highly selective fishing practices and the risk of endangered, threatened or protected species being captured or killed is minimal. Measure in place to assess and manage endangered, threatened or protected species interactions are considered adequate.</p>
<p>Objective 3 - The fishery is conducted, in a manner that minimises the impact of fishing operations on the ecosystem generally.</p>	
<p>Information requirements</p>	
<p>2.3.1 Information appropriate for the analysis in 2.3.2 is collated and/or collected covering the fishery's impact on the ecosystem and environment generally.</p>	<p>Does not meet – Minimal information is collected. QDAF has indicated that there is no active monitoring of ecosystem impacts from the fishery. The ERA for the fishery assessed risk to marine habitats as low and ecosystem processes as low/intermediate. The highly selective nature of fishing methods means that the impacts of the fishery on the ecosystem and marine environment are largely limited to the direct removal of sea cucumbers. CPUE data is collected in the fishery and there are harvest limits in place. However, it is unclear whether these limits would maintain stocks at a level appropriate to their role in the ecosystem.</p> <p>Conditions requiring surveys and development of stock assessments for highly targeted species will help better inform stock status and prevent overharvesting.</p>
<p>Assessment</p>	
<p>2.3.2 Information is collected and a risk analysis, appropriate to the scale of the fishery and its potential impacts, is conducted into the susceptibility of each of the following ecosystem components to the fishery.</p> <ol style="list-style-type: none"> 1. Impacts on ecological communities <ul style="list-style-type: none"> • Benthic communities • Ecologically related, associated or dependent species • Water column communities 2. Impacts on food chains <ul style="list-style-type: none"> • Structure • Productivity/flows 3. Impacts on the physical environment <ul style="list-style-type: none"> • Physical habitat • Water quality 	<p>Does Not Meet – The ecological risk assessment (ERA) identified a low risk to marine habitats and ecosystem components. However, there is no active monitoring of ecosystem impacts. Sea cucumbers are an important part of the health and productivity of sediment and reef habitats of the Great Barrier Reef where they play a vital role in bioturbation and the nutrient and carbonate cycles. The ecological impact of substantial and sustained removal of sea cucumber is unknown.</p> <p>There is currently no information collected on the impact of fishing on the ecosystem. The impact of fishing is largely limited to the impact of direct removal of sea cucumber due to the highly targeted nature of hand collection. If stocks are managed to avoid overfishing and localised depletion it is likely the ecological impacts of the fishery can be minimised.</p> <p>There is still significant uncertainty on the stock status of a number of species. Recent management changes and harvest trends showing concentrated harvest of some species, mean that the findings of the 2014 MSE should be revisited. Condition 5 requires a new MSE for the fishery.</p>

Management responses	
<p>2.3.3 Management actions are in place to ensure significant damage to ecosystems does not arise from the impacts described in 2.3.1.</p>	<p>Partially meets – Management actions are in place to limit overfishing but there is minimal monitoring of ecosystem impacts.</p> <p>Direct removal of sea cucumbers is the most significant risk posed by the fishery to the ecosystem and marine environment. There are a range of management action reduce the risk of overfishing already outlined (e.g., quota, reference limits and the rotational harvest arrangement). Beyond managing the risk of overharvesting there is no ability under the current management to detect or respond to impacts of fishing on the ecosystem.</p>
<p>2.3.4 There are decision rules that trigger further management responses when monitoring detects impacts on selected ecosystem indicators beyond a predetermined level, or where action is indicated by application of the precautionary approach.</p>	<p>Does not meet – No ecosystem indicators have been identified.</p> <p>The Harvest Strategy includes decision rules around managing ecological risk. These include a process to review and recommend appropriate action to address impacts identified by the ERA which pose an unacceptable level of risk to any ecological component in the fishery. The Harvest Strategy also includes a response to review management action if a reef health incident (coral bleaching, cyclones etc.) is identified under the Great Barrier Reef Marine Park Reef Health Incident Response Plan.</p> <p>Beyond managing the risk of overfishing of sea cucumbers there is no information gathered on the impact of fishing on the ecosystem, reducing the capacity to detect potential impacts. It is important that stock status of species harvested by the fishery is well understood.</p>
<p>2.3.5 The management response, considering uncertainties in the assessment and precautionary management actions, has a high chance of achieving the objective.</p>	<p>Partially meets – There is a medium chance of the management response achieving the objective.</p> <p>Without direct monitoring of the impacts of fishing on ecosystem indicators or components of the marine ecosystem, there should be a strong emphasis on precautionary management so that harvest does not compromise the important role sea cucumbers play in the ecosystem.</p> <p>Conditions requiring surveys and development of stock assessments for highly targeted species will help better inform stock status and prevent overharvesting.</p>

SECTION 4: ASSESSMENT AGAINST THE EPBC ACT

The table below is not a complete or exact representation of the EPBC Act. It is intended to show that the relevant sections and components of the EPBC Act have been taken into account in the formulation of advice on the fishery in relation to decisions under Part 13 and Part 13A.

Part 12 – Identifying and monitoring biodiversity and making bioregional plans

Section 176 Bioregional Plans	Comment
(5) Minister must have regard to relevant bioregional plans	<p>Meets – The relevant bioregional plans have been considered in this assessment.</p> <p>The fishery operates in the Great Barrier Reef Marine Park and in a small area of both Coral Sea and Temperate East Marine regions. There is no bioregional plan currently in place for the Great Barrier Reef Marine Park.</p> <p>The Marine bioregional plan for the Temperate East Marine Region 2012 has been considered in preparing advice in relation to decisions under section 303DC and section 303FN. The values of the Coral Sea Commonwealth Marine Reserves which relate to marine bioregions have also been considered in preparing this advice. There is a very small area of the fishery that overlaps with this bioregion and fishing practices are highly targeted and selective in nature. An action taken by an individual fisher, acting in accordance with the management regime for the fishery, is unlikely to have a significant impact on the key ecological features, biologically important areas or other matters identified in the Temperate East Marine Bioregional Plan.</p> <p>The assessment considered the possible ecological impacts of the operation of the fishery on the Great Barrier Reef Marine Park, the World Heritage values of the Great Barrier Reef World Heritage Area and the ecological character of the Great Sandy Strait, Shoalwater and Corio Bays and Bowling Green Bay Ramsar Sites. We consider that an action taken by an individual fisher, acting in accordance with the management regime and the conditions required under this approval for the fishery, would not be expected to have a significant ecological impact on the Great Barrier Reef Marine Park, the World Heritage values of the Great Barrier Reef World Heritage Area or the ecological character of a Wetland of International Importance in the short term.</p> <p>While there is little evidence to suggest systematic change to species diversity or richness has been directly caused by the fishery. Black Teatfish, may have been</p>

	<p>depleted by historic fishing pressure and the recommendation to not include this species in the WTO approval may lead to a gradual rebuilding of the stock. Sea cucumbers play an important role in the ecosystem and there are concerns that the harvest of some species may not be based on sufficient understanding of the stocks. Harvest levels should be considered in line with the role of the species in the ecosystem and performance measures to control the level harvest and prevent localised depletion should be based on a strong understanding of the species biology and stock status.</p> <p>Confidence in the performance of the fishery to manage potential impacts on bioregions within the fishery area could be improved with stock assessments, surveys and a review of the management regime, outlined in the conditions of this assessment.</p>
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Part 13 – Species and communities

Accreditable plan, regime or policy (Division 1, Division 2, Division 3, Division 4)	Comment
<p>s. 208A (1) (a-e) , s.222A (1) (a-e), s.245 (1) (a-e), s.265 (1) (a-e) Does the fishery have an accreditable plan of management, regime or policy?</p>	<p>Meets – There is an accreditable management regime in place.</p> <p>The management arrangements for the fishery are specified in QDAF and Great Barrier Reef Marine Park Authority issued permits, as well as in publicly available legislation: the <i>Fisheries Act 1994</i> (Qld), <i>Fisheries (General) Regulation 2019</i> (Qld), <i>Fisheries (Commercial Fisheries) Regulation 2019</i> (Qld), <i>Fisheries Declaration 2019</i> (Qld), <i>Fisheries Quota Declaration 2019</i> (Qld), <i>Marine Parks Act 2004</i> (Qld), and the <i>Marine Parks Regulations 2019</i> (Qld). The <i>Great Barrier Reef Marine Park Act 1975</i> (Cth) and <i>Great Barrier Reef Marine Park Regulations 2019</i> (Cth) also apply to operations in the Great Barrier Reef Marine Park.</p>
Division 1 Listed threatened species, Section 208A Minister may accredit plans or regimes	Comment
<p>(f) Will the plan, regime or policy require fishers to take all reasonable steps to ensure that members of listed threatened species (other than conservation dependent species) are not killed or injured as a result of the fishing?</p>	<p>Meets – The management regime requires all reasonable steps be taken to avoid interactions with listed threatened species.</p> <p>This includes gear limitations (hand collection only) and compulsory reporting of interactions.</p>

	An ERA has been conducted for the fishery which assessed the risk to listed threatened species to be negligible to low and likely limited to boat strikes and disturbance by moving or anchoring boats. Fishers are required to report all interactions with these species.
(g) And, is the fishery likely to adversely affect the survival or recovery in nature of the species?	Meets – The fishery is not likely to adversely affect the survival or recovery in nature of the species. The Harvest Strategy for the fishery includes a decision-making framework which would be triggered if an ERA identified unacceptably high risk to any ecological component of the fishery, including listed threatened species. The ERA published in 2021 found a low risk to listed threatened species. No interactions with listed threatened species have been reported by the fishery.
Division 2 Migratory species, Section 222A Minister may accredit plans or regimes	Comment
(f) Will the plan, regime or policy require fishers to take all reasonable steps to ensure that members of listed migratory species are not killed or injured as a result of the fishing?	Meets – The management regime requires all reasonable steps be taken to avoid interactions with listed migratory species. This includes gear limitations (hand collection only) and compulsory reporting of interactions. An ERA has been conducted for the fishery which assessed the risk to migratory species to be negligible to low and likely limited to boat strikes and disturbance by moving or anchoring boats. Fishers are required to report all interactions with these species.
(g) And, is the fishery likely to adversely affect the conservation status of a listed migratory species or a population of that species?	Meets – The fishery is not likely to adversely affect the conservation status of a listed migratory species or a population of the species. The Harvest Strategy for the fishery includes a decision-making framework which would be triggered if an ERA identified unacceptably high risk to any ecological component of the fishery, including listed migratory species. The ERA published in 2021 found a low risk to these species. No interactions with listed migratory species have been reported by the fishery.
Division 3 Whales and other cetaceans, Section 245 Minister may accredit plans or regimes	Comment

<p>(f) Will the plan, regime or policy require fishers to take all reasonable steps to ensure that cetaceans are not killed or injured as a result of the fishing?</p>	<p>Meets – The management regime requires all reasonable steps be taken to avoid interactions with cetaceans.</p> <p>This includes gear limitations (hand collection only) and compulsory reporting of interactions.</p> <p>An ERA has been conducted for the fishery which assessed the risk to cetaceans to be negligible to low and likely limited to boat strikes and disturbance by moving or anchoring boats. Fishers are required to report all interactions with cetaceans.</p>
<p>(g) And, is the fishery likely to adversely affect the conservation status of a species of cetacean or a population of that species?</p>	<p>Meets – The fishery is not likely to adversely affect the conservation status of a species of cetacean or a population of the species.</p> <p>The Harvest Strategy for the fishery includes a decision-making framework which would be triggered if an ERA identified unacceptably high risk to any ecological component of the fishery, including cetaceans. The ERA published in 2021 found a low risk to these species.</p> <p>No interactions with cetaceans have been reported by the fishery.</p>
<p>Division 4 Listed marine species, Section 265 Minister may accredit plans or regimes</p>	<p>Comment</p>
<p>(f) Will the plan, regime or policy require fishers to take all reasonable steps to ensure that members of listed marine species are not killed or injured as a result of the fishing?</p>	<p>Meets – The management regime requires all reasonable steps be taken to avoid interactions with listed marine species.</p> <p>This includes gear limitations (hand collection only) and compulsory reporting of interactions.</p> <p>An ERA has been conducted for the fishery which assessed the risk to listed marine species to be negligible to low and likely limited to boat strikes and disturbance by moving or anchoring boats. Fishers are required to report all interactions with these species.</p>
<p>(g) And, is the fishery likely to adversely affect the conservation status of a listed marine species or a population of that species?</p>	<p>Meets – The fishery is not likely to adversely affect the conservation status of a listed marine species or a population of that species.</p> <p>The Harvest Strategy for the fishery includes a decision-making framework which would be triggered if an ERA identified unacceptably high risk to any ecological component of the fishery, including listed marine species. The ERA published in 2021 found a low risk to these species.</p> <p>No interactions with listed marine species have been reported by the fishery.</p>

Section 303AA Conditions relating to accreditation of plans, regimes and policies	Comment
(1) This section applies to an accreditation of a plan, regime or policy under section 208A, 222A, 245 or 265.	The department recommends that the management regime for the fishery be accredited under sections 208A, 222A, 245 and 265.
<p>(2) The Minister may accredit a plan, regime or policy under that section even though he or she considers that the plan, regime or policy should be accredited only:</p> <p>(a) during a particular period; or</p> <p>(b) while certain circumstances exist; or</p> <p>(c) while a certain condition is complied with.</p> <p>In such a case, the instrument of accreditation is to specify the period, circumstances or condition.</p>	The department considers that no conditions are required for the accreditation of the management regime for the fishery under Part 13.

Part 13A – International movement of wildlife specimens

Section 303BA Objects of Part 13A	
<p>(1) The objects of this Part are as follows:</p> <p>(a) to ensure that Australia complies with its obligations under CITES and the Biodiversity Convention;</p> <p>(b) to protect wildlife that may be adversely affected by trade;</p> <p>(c) to promote the conservation of biodiversity in Australia and other countries;</p> <p>(d) to ensure that any commercial utilisation of Australian native wildlife for the purposes of export is managed in an ecologically sustainable way;</p> <p>(e) to promote the humane treatment of wildlife;</p> <p>(f) to ensure ethical conduct during any research associated with the utilisation of wildlife; and</p> <p>(h) to ensure the precautionary principle is taken into account in making decisions relating to the utilisation of wildlife.</p>	<p>The management arrangements for the fishery have been assessed as consistent with the general guidance provided in the objects of Part 13A, subject to conditions to be added to the declaration as:</p> <ul style="list-style-type: none"> • the fishery has been assessed as meeting the Non-Detriment Finding requirements for White Teatfish, a species listed under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), for the three-year term of accreditation, subject to conditions • there are management arrangements in place to ensure that the resource is managed in an ecologically sustainable way • the operation of the fishery is unlikely to be unsustainable and threaten biodiversity within the next three years, and • the Environment Protection and Biodiversity Conservation Regulations 2000 do not specify fish as a class of animal in relation to the welfare of live specimens.
Section 303 CG Minister may issue permits (CITES species)	Comment
(3) The Minister must not issue a permit unless the Minister is satisfied that:	This fishery targets a range of sea cucumber species including White Teatfish and Black Teatfish which are listed under CITES. Concerns regarding the lack of

<p>(a) the action or actions specified in the permit will not be detrimental to, or contribute to trade which is detrimental to:</p> <p>(i) the survival of any taxon to which the specimen belongs; or</p>	<p>evidence to determine the potential detrimental impact of this fishery on CITES listed species have prompted conditions on this fishery. Only in the context of the three year export accreditation and with the implementation of these conditions does the department consider the risk to the CITES listed White Teatfish sufficiently low to consider the fishery non-detrimental to the survival of the species. The department cannot currently support a Non-Detriment Finding for the harvest of Black Teatfish from the fishery.</p> <p>Regular updates on progress toward the conditions and catch is vital to monitor the status of CITES listed specimens harvested by the fishery.</p>
<p>(ii) the recovery in nature of any taxon to which the specimen belongs; or</p>	<p>The recent stock assessment of White Teatfish indicates the stock is at 76% of unfished biomass. There are concerns about the assessment being based on harvest data and not biomass surveys and the stock assessment methodology not fully accounting for important assumptions in this data.</p> <p>The department cannot currently support a Non-Detriment Finding for the harvest of Black Teatfish from the fishery. QDAF has acknowledged that the department will need to further consider the export of Black Teatfish during the course of the WTO.</p>
<p>(iii) any relevant ecosystem (for example, detriment to habitat or biodiversity); and</p>	<p>Recognising the nature of harvest and gear used in the fishery (hand collection), the potential for the fishery to impact unacceptably and unsustainably on the marine ecosystem is considered relatively low and likely to be limited to the direct removal of sea cucumbers. Sea cucumbers play an important role in bioturbation and nutrient cycling which may be compromised if stocks become overfished or locally depleted. The department is satisfied that the management measures already in place, along with those proposed in conditions, are likely to minimise impact of the fishing operation on the ecosystem.</p>
Section 303DC Minister may amend list (non CITES species)	Comment
<p>(1) The Minister may, by legislative instrument, amend the list referred to in section 303DB [list of exempt native specimens] by:</p> <p>(a) doing any of the following:</p> <p>(i) including items in the list;</p> <p>(ii) deleting items from the list;</p> <p>(iii) imposing a condition or restriction to which the inclusion of a specimen in the list is subject;</p>	<p>The department recommends that specimens that are or are derived from fish or invertebrates harvested in the fishery as defined in the management regime in force under the <i>Fisheries Act 1994</i> (Qld), <i>Fisheries (General) Regulation 2019</i> (Qld), <i>Fisheries (Commercial Fisheries) Regulation 2019</i> (Qld), <i>Fisheries Declaration 2019</i> (Queensland), <i>Fisheries Quota Declaration 2019</i> (Qld), <i>Marine Parks Act 2004</i> (Qld), <i>Marine Parks Regulations 2019</i> (Qld), <i>Great Barrier Reef Marine Park Act 1975</i> (Cth), and <i>Great Barrier Reef Marine Park Regulations 2019</i> (Cth) but not including:</p>

<p>(iv) varying or revoking a condition or restriction to which the inclusion of a specimen in the list is subject; or</p> <p>(b) correcting an inaccuracy or updating the name of a species.</p>	<p>a) specimens that belong to taxa listed under section 209 of the EPBC Act (Australia's List of Migratory Species), or</p> <p>b) specimens that belong to taxa listed under section 248 of the EPBC Act (Australia's List of Marine Species), or</p> <p>c) specimens that belong to eligible listed threatened species, as defined under section 303BC of the EPBC Act, or</p> <p>d) specimens that belong to taxa listed under section 303CA of the EPBC Act (Australia's CITES List),</p> <p>be included in the list of exempt native specimens until 30 November 2024, while the fishery is subject to a declaration as an approved Wildlife Trade Operation.</p>
<p>(1A) In deciding to amend the LENS, the Minister must rely primarily on outcomes an assessment under Part 10, Divisions 1 or 2</p>	<p>Not applicable</p> <p>There has been no request or agreement to assess the fishery under Part 10 Division 1, and the fishery is not managed by the Commonwealth, so Part 10, Division 2 does not apply.</p>
<p>(1C) The above does not limit matters that may be considered when deciding to amend LENS.</p>	<p>Not applicable</p> <p>Although there is no strategic assessment under Part 10 of the EPBC Act, the Department considers its assessment has taken into account all matters relevant for making an informed decision to amend the list of exempt native specimens to include product taken in this fishery.</p>
<p>(3) Before amending the LENS, the Minister must consult:</p> <p>(a) other Minister or Ministers as appropriate; and</p> <p>(b) other Minister or Ministers of each State and self-governing Territory as appropriate; and</p> <p>(c) other persons and organisations as appropriate.</p>	<p>Meets</p> <p>The submission from QDAF was made available on the department's website from 5 August 2021 until 9 September 2021. Twelve comments were received.</p>

Section 303FN Approved wildlife trade operation	Comment
<p>(3) The Minister must not declare an operation as an approved wildlife trade operation unless the Minister is satisfied that:</p> <p>(a) the operation is consistent with the objects of Part 13A of the Act; and</p> <p>(b) the operation will not be detrimental to:</p> <p>(i) the survival of a taxon to which the operation relates; or</p> <p>(ii) the conservation status of a taxon to which the operation relates; and</p> <p>(ba) the operation will not be likely to threaten any relevant ecosystem including (but not limited to) any habitat or biodiversity; and</p>	<p>Meets</p> <p>The fishery is consistent with Objects of 13A – see above assessment against the Guidelines.</p> <p>The fishery is consistent with Objects of 13A and unlikely to be detrimental to the survival or conservation status of a taxon to which it relates, nor will it threaten any relevant ecosystem, within the next three years, given the management measures in place and agreed conditions in Section 4.</p> <p>There are, however, concerns about the biological basis for harvest limits due to the lack of biomass surveys. Due to the important role that sea cucumbers play in the ecosystem, it is important that harvest should not occur at a levels that jeopardises their role in the ecosystem. There have been recent management changes in the fishery that should be investigated through a new Management Strategy Evaluation, as outlined in the conditions.</p>
<p>(c) if the operation relates to the taking of live specimens that belong to a taxon specified in the regulations – the conditions that, under the regulations, are applicable to the welfare of the specimens are likely to be complied with; and</p>	<p>Meets</p> <p>The Environment Protection and Biodiversity Conservation Regulations 2000 (EPBC Regulations) do not specify sea cucumbers as a class of animal in relation to the welfare of live specimens.</p>
<p>(d) such other conditions (if any) as are specified in the regulations have been, or are likely to be, satisfied.</p>	<p>Meets</p> <p>No other conditions are specified in relation to commercial fisheries in the EPBC Regulations.</p>
<p>(4) In deciding whether to declare an operation as an approved wildlife trade operation the Minister must have regard to:</p> <p>(a) the significance of the impact of the operation on an ecosystem (for example, an impact on habitat or biodiversity); and</p>	<p>Meets</p> <p>The direct impact of this fishery is unlikely to have a significant impact on ecosystems in the fishery, due to the highly selective and targeted nature of hand collections. However, due to the important role sea cucumbers play in the ecosystem conditions to better understand the status of stocks in the fishery and the effectiveness of the management in preventing overfishing, will reduce any potential indirect impacts from the removal of sea cucumbers. Given the current management arrangements (including those described in s303FN 3(b)) and the conditions on the approval of this WTO, it is unlikely that the fishery will have a significant impact on any relevant ecosystem in the course of a 3 years.</p>

<p>(b) the effectiveness of the management arrangements for the operation (including monitoring procedures).</p>	<p>Meets</p> <p>This assessment has raised concerns about the level of understanding and management arrangements for target stocks. When operating in accordance with the conditions outlined in Section 2, the management arrangements are likely to be acceptable in the context of a three-year WTO.</p>
<p>(5) In deciding whether to declare an operation as an approved wildlife trade operation the Minister must have regard to:</p> <p>(a) whether legislation relating to the protection, conservation or management of the specimens to which the operation relates is in force in the State or Territory concerned; and</p> <p>(b) whether the legislation applies throughout the State or Territory concerned; and</p> <p>(c) whether, in the opinion of the Minister, the legislation is effective.</p>	<p>Meets</p> <p>The fishery will be managed under the <i>Fisheries Act 1994</i> (Qld), Fisheries (General) Regulation 2019 (Qld), Fisheries (Commercial Fisheries) Regulation 2019 (Qld), Fisheries Declaration 2019 (Queensland), Fisheries Quota Declaration 2019 (Qld), <i>Marine Parks Act 2004</i> (Qld), and the Marine Parks Regulations 2019 (Qld). <i>The Great Barrier Reef Marine Park Act 1975</i> (Cth), and Great Barrier Reef Marine Park Regulations 2019 (Cth) also apply to the operations in the Great Barrier Reef Marine Park. The <i>Fisheries Act 1994</i> (Qld) applies throughout all Queensland waters.</p> <p>The Department considers that the legislation is likely to be effective.</p>
<p>(10) For the purposes of section 303FN, an operation is a wildlife trade operation if, and only if, the operation is an operation for the taking of specimens and:</p> <p>(a) the operation is a commercial fishery.</p>	<p>Meets</p> <p>The Queensland Sea Cucumber Fishery (East Coast) is a commercial fishery.</p>

<p>(10A) In deciding whether to declare that a commercial fishery is an approved wildlife trade operation for the purposes of this section, the Minister must rely primarily on the outcomes of any assessment in relation to the fishery carried out for the purposes of Division 1 or 2 of Part 10.</p> <p>(10B) Subsection (10A) does not limit the matters that may be taken into account in deciding whether to declare that a fishery is an approved wildlife trade operation for the purposes of this section.</p>	<p>There has been no request or agreement to assess the fishery under Part 10 Division 1, and the fishery is not managed by the Commonwealth, so Part 10 Division 2 does not apply.</p> <p>Although there is no strategic assessment under Part 10 of the EPBC Act, the Department considers its assessment has taken into account all matters relevant to making an informed decision to amend the list of exempt native specimens to include product taken in this fishery.</p>
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Section 303FR Public consultation	Comment
<p>(1) Before making a declaration under section 303FN, the Minister must cause to be published on the Internet a notice:</p> <ul style="list-style-type: none"> (a) setting out the proposal to make the declaration; and (b) setting out sufficient information to enable persons and organisations to consider adequately the merits of the proposal; and (c) inviting persons and organisations to give the Minister, within the period specified in the notice, written comments about the proposal. <p>(2) A period specified in the notice must not be shorter than 20 business days after the date on which the notice was published on the Internet.</p> <p>(3) In making a decision about whether to make a declaration under section 303FN, the Minister must consider any comments about the proposal to make the declaration that were given in response to the invitation in the notice.</p>	<p>Meets</p> <p>A public notice, which set out the proposal to declare the fishery an approved Wildlife Trade Operation and included the application from the fishery, was released for public comment on from 5 August 2021 until 9 September 2021, a period of 26 business days.</p> <p>Twelve public comments were received on the submission. The public comments pointed out the vital role sea cucumbers play in the ecosystem. The comments expressed concerns about the intrinsic vulnerability of sea cucumbers to overharvesting and whether the management arrangements of the fishery are conducive to meeting Australia’s obligations under CITES or the aims of the Reef 2050 Long Term Sustainability Plan.</p> <p>Public comments also raised concerns about the lack of adequate stock status information and inconsistent and inadequate information from previous surveys particularly for Black Teatfish. The comments noted concerns about significant uncertainty in recent biomass surveys for Black Teatfish.</p> <p>There were also concerns raised about the concentration of harvest in specific areas of the fishery despite the RHA only permitting harvest for a limited time in each zone of the fishery every three years.</p> <p>Comments were also received on the high level of vulnerability of these species to fishing pressure as they are sedentary, later maturing and show low levels of recruitment as they require a certain density of individuals on a reef to successfully spawn. If fished to below this point, recovery is very slow to the point local extinction may occur.</p> <p>Copies of the public comments and QDAF’s response to the issues raised in these submissions will be provided to the decision maker with this assessment report. The public comments and QDAF’s response were considered in this assessment and conditions outlined in Section 2, have been set to address these issues.</p>
Section 303FT Additional provisions relating to declarations	Comments
<p>(1) This section applies to a declaration made under section 303FN, 303FO or 303FP.</p>	<p>A declaration for the fishery will be made under section 303FN.</p>

<p>(4) The Minister may make a declaration about a plan or operation even though he or she considers that the plan or operation should be the subject of the declaration only:</p> <p>(a) during a particular period; or (b) while certain circumstances exist; or (c) while a certain condition is complied with.</p> <p>In such a case, the instrument of declaration is to specify the period, circumstances or condition.</p>	<p>The standard conditions applied to commercial fishery wildlife trade operations include:</p> <ul style="list-style-type: none"> • operation in accordance with the management regime • notifying the Department of changes to the management regime, and • annual reporting in accordance with the requirements of the Australian Government <i>Guidelines for the Ecologically Sustainable Management of Fisheries – 2nd Edition</i>. <p>The Wildlife Trade Operation instrument for the fishery specifies the standard and any additional conditions applied, over the specified period of three years, to the 30 November 2024. Further conditions specific to this WTO are outlined in Section 2 of this assessment and require reporting prior to the standard submission of annual reports.</p>
<p>(8) A condition may relate to reporting or monitoring.</p>	<p>In addition to the conditions requiring annual reporting, Section 2 includes a number of conditions that require ongoing monitoring and reporting of information to the department.</p>
<p>(9) The Minister must, by instrument published in the <i>Gazette</i>, revoke a declaration if he or she is satisfied that a condition of the declaration has been contravened.</p>	

Part 16 – Precautionary principle and other considerations in making decisions

Section 391 Minister must consider precautionary principle in making decisions	Comment
<p>(1) Minister must take account of the precautionary principle in making a decision, to the extent that the decision is consistent with other provisions under this Act.</p> <p>(2) The precautionary principle is that lack of full scientific certainty should not be used as a reason for postponing a measure to prevent degradation of the environment where there are threats of serious or irreversible environmental damage.</p>	<p>Meets</p> <p>The department’s assessment has identified certain issues that require attention by QDAF, including the need for further biomass surveys and stock assessments. The conditions proposed for inclusion on the proposed Part 13A approval are designed to address these issues and represent a precautionary approach to the management of environmental uncertainty and risk. The management regime, when supported by these conditions is likely to prevent serious or irreversible environmental damage being caused by this fishery.</p>

	<p>Based on the application of the precautionary principle, the department has recommended a number of conditions to be placed on the WTO declaration for this fishery. On the same basis, the department cannot currently support a Non-Detriment Finding for the harvest of Black Teatfish from the fishery.</p>
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SECTION 5: ADDITIONAL INFORMATION ON THE FISHERY

Assessment history

Information on previous assessments for the Queensland Sea Cucumber Fishery (East Coast) is available on the Department's website at: <http://www.environment.gov.au/marine/fisheries/qld/sea-cucumber>.

1st assessment finalised November 2004 – The fishery was declared an approved Wildlife Trade Operation for 3 years. Export approval was subject to 11 recommendations.

2nd assessment finalised December 2007 – The fishery was declared an approved Wildlife Trade Operation for 3 years. Export approval was subject to 3 conditions and 3 recommendations.

3rd assessment finalised July 2011 – The fishery was declared an approved Wildlife Trade Operation for 3 years. Export approval was subject to 4 conditions and 5 recommendations.

4th assessment finalised July 2014 – The fishery was declared an approved Wildlife Trade Operation for 3 years. Export approval was subject to 3 conditions and 5 recommendations.

5th assessment – The fishery was granted export approval via the List of Exempt Native Specimens for 23 March 2018 – 28 August 2025.

6th assessment finalised September 2020 – The fishery was declared an approved Wildlife Trade Operation for 1 year following the listing of Black Teatfish (*Holothuria whitmaei*) and White Teatfish (*H. fuscogilva*) on Appendix II of CITES. Export approval was subject to 7 conditions.

Fishery reporting

Annual reports:

Queensland Government, Department of Agriculture and Fisheries, 'Queensland Fisheries Summary Report 2018/19 Financial Year', 2019. <https://www.daf.qld.gov.au/business-priorities/fisheries/monitoring-research/data/queensland-fisheries-summary-report> Accessed: 27 September 2021

Key links

Fishery information:

Queensland Government, Business Queensland 'Sea cucumber fishery' 2016. <https://www.business.qld.gov.au/industries/farms-fishing-forestry/fisheries/fisheries-profiles/commercial-harvest-fisheries/sea-cucumber> Accessed: 27 September 2021

Enforcing legislation:

The fishery is managed in accordance with provisions in the following Queensland legislation and regulations available at <https://www.legislation.qld.gov.au/> and Commonwealth legislation available at <https://www.legislation.gov.au/Details/C2017C00279> Accessed: 27 September 2021

- *Fisheries Act 1994* (Qld)
- Fisheries (General) Regulation 2019 (Qld)
- Fisheries (Commercial Fisheries) Regulation 2019 (Qld)
- Fisheries Declaration 2019 (Qld)
- Fisheries Quota Declaration 2019 (Qld)
- *Marine Parks Act 2004* (Qld)
- Marine Parks Regulations 2019 (Qld)
- *Great Barrier Reef Marine Park Act 1975* (Cth)
- Great Barrier Reef Marine Park Regulations 2019 (Cth),

Harvest strategy:

A harvest strategy was implemented on 1 September 2021.

<https://www.publications.qld.gov.au/dataset/queensland-fisheries-harvest-strategies/resource/f9ec2eab-9f61-4d49-930f-6f9446102b85> Accessed: 3 November 2021

Ecological Risk Assessment:

Queensland Sea Cucumber Fishery (East Coast) Level 1 Ecological Risk Assessment

<https://era.daf.qld.gov.au/id/eprint/8282/> Accessed: 27 September 2021

Stock assessments:

Stock assessment of white teatfish (*Holothuria fuscogilva*) in Queensland, Australia

<https://era.daf.qld.gov.au/id/eprint/8264/> Accessed 27 September 2021

Stock assessment of black teatfish (*Holothuria whitmaei*) in Queensland, Australia

<http://era.daf.qld.gov.au/id/eprint/8265/> Accessed 27 September 2021

REFERENCES

Benzie, J.A., and Uthicke, S. (2003) 'Stock size of bêche-de-mer, recruitment patterns and gene flow in black teatfish, and recovery of over-fished black teatfish stocks on the Great Barrier Reef'. Final Report to the Fisheries Research and Development Corporation, FRDC Project #97/344. Australian Institute of Marine Science, Townsville, 160pp

Department of Agriculture and Water Resources 2018, Commonwealth Fisheries Harvest Strategy Policy, Canberra, June. CC BY 4.0

Department of Sustainability, Environment, Water, Population and Communities 2012 'Marine bioregional plan for the Temperate East Marine Region, Department of Sustainability, Environment, Water, Population and Communities, Canberra ACT, Available at: <http://www.environment.gov.au/marine/marine-bioregional-plans>.

Eriksson H., Byrne M. 2015 'The sea cucumber fishery in Australia's Great Barrier Reef follows global patterns of serial exploitations', *Fish and Fisheries*. 2015, 16, 329-341.

Knuckey, I., and Koopman, M., (2016). 'Survey to estimate the biomass and recovery of Black teatfish (*Holothuria whitmaei*) in Zone 1 of the Queensland Sea Cucumber Fishery (East Coast)', Fishwell Consulting. 41pp. 2016. CC BY 3.0

Koopman, M., and Knuckey, I., (2021). 'Biomass survey of Black Teatfish in Zone 2 of the Queensland Sea Cucumber Fishery (East Coast)', Fishwell Consulting. Available at: <https://daf.engagementhub.com.au/draft-sea-cucumber-fishery-harvest-strategy>

Purcell, S.W. Managing sea cucumber fisheries with an ecosystem approach. Edited/compiled by Lovatelli, A.; M. Vasconcellos and Y. Yimin. FAO Fisheries and Aquaculture Technical Paper. No. 520. Rome, FAO. 2010. 157p.

Skewes, T., Plagányi, E., Murphy, N., Pascual, R., Fischer M., (2014) 'Evaluating rotational harvest strategies for sea cucumber fisheries'. CSIRO. Brisbane. pp. 176. CC BY 3.0