

# Chapter 1

## Overview and key issues

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### 1.1 Introduction

The Australian Government has direct management responsibility for a significant proportion of Australia's fisheries resources. The 22 fisheries managed by the Australian Government accounted for 38% of the total volume and 27% of the total value of Australia's wild-catch fisheries production in 2020–21.

Legislation requires the Australian Government to manage these fisheries so as to maintain fish stocks at ecologically sustainable levels and, within this context, maximise the net economic returns (NER) to the Australian community (*Fisheries Management Act 1991* – FM Act). In its management of fish stocks and fisheries, the Australian Government is also required to consider the impact of fishing activities on non-target species and the long-term sustainability of the marine environment (FM Act; *Environment Protection and Biodiversity Conservation Act 1999* – EPBC Act).

The current framework for the management of Australian Government-managed fisheries was established in 1989 by the policy statement *New directions for Commonwealth fisheries management in the 1990s* (Australian Government 1989). This policy statement resulted in the *Fisheries Administration Act 1991*, which created the Australian Fisheries Management Authority (AFMA) and led to the development of the FM Act. *New directions* also established the role of ABARES as the provider of accurate public assessments on the status of fish stocks to help assess the performance of fisheries management. This role has been reinforced by subsequent policies and processes.

ABARES has fulfilled this role since 1992 through the publication of annual *Fishery status reports*. These reports provide an independent assessment of the biological status of fish stocks and the economic status of fisheries that are managed, or jointly managed, by the Australian Government. The *Fishery status reports* play a critical role in ensuring transparency and accountability for the management of these fisheries, consistent with the requirements of legislation and policy. They provide the Australian public with confidence that Australia's marine resources are being managed appropriately. The *Fishery status reports* can also be a key source of information for the fishing industry – for example, to support independent certification processes that can increase industry market access and economic viability.

It is important to note that fisheries managed by AFMA fall into 2 broad categories: fisheries managed solely by AFMA, and fisheries managed jointly by AFMA and 1 or more other jurisdictions (state or territory governments, or international regional fisheries management organisations – RFMOs). This distinction is important because AFMA's ability to deliver on its legislative requirements is significantly reduced in fisheries where control, compliance, assessment and decision-making are shared with other jurisdictions.

## 1.2 Assessing status

### Assessing biological status

The Commonwealth Fisheries Harvest Strategy Policy (HSP; Department of Agriculture and Water Resources 2018b) requires that harvest strategies are implemented for commercial fish stocks that (inter alia):

- maintain all commercial fish stocks, including byproduct, above a biomass limit where the risk to the stock is regarded as unacceptable ( $B_{LIM}$ ) at least 90% per cent of the time, and,
- ensure that fishing is conducted in a manner that does not lead to overfishing.

The HSP defines overfishing as ‘A stock that is experiencing too much fishing. The rate of removals from a stock is likely to result in the stock becoming overfished. For a stock that is overfished, overfishing is a rate of removals that will prevent stock recovery in accordance with its rebuilding strategy.’

In assessing biomass status, ABARES considers whether the biomass of a stock is above or below the limit reference point (LRP or  $B_{LIM}$ ). If biomass is below this level, a stock is considered to be overfished. In assessing fishing mortality status, ABARES considers whether fishing mortality in the year being assessed is likely to either drive the stock into an overfished state or prevent the stock from rebuilding from an overfished state within a time frame consistent with the requirements of the HSP. If fishing mortality exceeds either of these thresholds, a stock is considered to be subject to overfishing. Where direct estimates of fishing mortality and/or biomass are not available, ABARES uses a weight-of-evidence approach to determine status.

Stocks are included in the *Fishery status reports* if they are currently, or have been, an important part of a fishery. Stocks may be included if they represent a significant component of the fishery in terms of volume or value, are managed under a total allowable catch (TAC), have previously been classified as ‘overfished’ and have not yet recovered to above the LRP, or were previously included in the *Fishery status reports* as a single stock and have since been reclassified as multiple stocks to align with species biology or management.

Stocks may be removed from the reports if they cease to be an important part of a fishery (that is, the fishery changes practices or markets change). However, stocks will not be removed where they continue to be managed under a TAC or have previously been classified as overfished and have not yet recovered to above the LRP.

Information to support determination of biological stock status is derived from a range of sources, including stock assessments, the outcomes of the application of harvest strategies (for example, harvest control rules), and catch-and-effort data. The information used and the process of status determination are explained in more detail in Chapter 29.

### Assessing economic status

The economic status of each Australian Government–managed fishery (excluding jointly managed Torres Strait fisheries) is determined by assessing management performance against the economic objective of the FM Act, which is to maximise NER to the Australian community. Economic status is evaluated by assessing whether potential NER are being limited by prevailing management arrangements in the fishery. To do this, indicators are used to describe current economic trends in a fishery before assessing the drivers of those trends and the extent to which the fishery management arrangements are allowing NER to be maximised.

The economic status of Torres Strait fisheries is also evaluated. However, because these fisheries are managed under the *Torres Strait Fisheries Act 1984*, the HSP and its economic objective do not apply. Therefore, performance of these fisheries is assessed against fishery-specific objectives, as well as those of section 8 of the *Torres Strait Fisheries Act 1984*.

Assessing performance against the economic objective requires first isolating the drivers of change in economic indicators and then assessing whether the current management arrangements are enabling the long-run NER to be maximised, subject to market conditions. The first step is required because NER can change for several reasons, some of which are within the control of fishery managers (for example, management arrangements) and some of which are outside the control of managers (for example, the price of fish). Interpreting trends in economic indicators without such an assessment may result in incorrect conclusions being drawn about management performance. For example, NER from a fishery may be increasing over time, but interpreting this requires ruling out that the increase is occurring at the cost of a reduction of the fish stock to unsustainable levels. Similarly, NER may be increasing because of changes in the price of fish or reductions in the costs of inputs that are not controlled by fishery management.

The second step requires assessing 3 key components of management arrangements to determine whether NER are being maximised:

- management of fish stocks to the level associated with maximum economic yield (MEY)
- management arrangements that do not impede fishers to maximise revenue and minimise costs for a given level of harvest
- costs of fishery management.

A range of indicators are used to assess the economic status of fisheries. These include surveys of NER calculated by ABARES for some of the most valuable Australian Government-managed fisheries, together with productivity measures that support the interpretation of a fishery's trend in NER. For other fisheries, indicators of fishery revenue and costs (for example, estimates of gross value of production [GVP], and measures of fishing effort and fuel prices) are analysed to evaluate likely changes in NER. The level of unused fishing rights ('latency') can also provide an indication of NER for data-poor fisheries.

## Assessing environmental status

The *Fishery status reports* examine the broader impact of Australian Government-managed fisheries on the environment. The requirements of the FM Act, the EPBC Act and the Commonwealth Fisheries Bycatch Policy (Department of Agriculture and Water Resources 2018a) are considered in this context. The Australian Government aims to implement an ecosystem-based approach to fisheries management as part of meeting the principles of ecologically sustainable development. This requires a holistic approach to management that considers fisheries' interactions with, and impacts on, bycatch species (including protected species), marine habitats, communities and ecosystems.

All Australian Government-managed fisheries must be accredited under part 13 of the EPBC Act. Accreditation under part 13 of the EPBC Act means that the management plan of a fishery is accredited. Accreditation under part 13A of the EPBC Act is an approval to export product from the fishery. Chapters of *Fishery status reports 2022* provide details of accreditations under the EPBC Act.

A key component of AFMA's ecosystem-based approach to fisheries management has been the application of an ecological risk management (ERM) framework that is designed to respond to the outcomes of ecological risk assessment (ERA) (AFMA 2017; Hobday et al. 2007). The *Fishery status reports* provide a summary of ERAs undertaken, risks identified and management action taken.

Operators in Australian Government-managed fisheries are required to report all interactions with species listed as protected, migratory and/or threatened<sup>1</sup> under the EPBC Act in their logbooks. Chapters of *Fishery status reports 2022* provide a summary of these interactions for each fishery or sector. A summary of interactions across all Australian Government-managed fisheries is provided in section 1.3 of this chapter.

## 1.3 Status in 2022

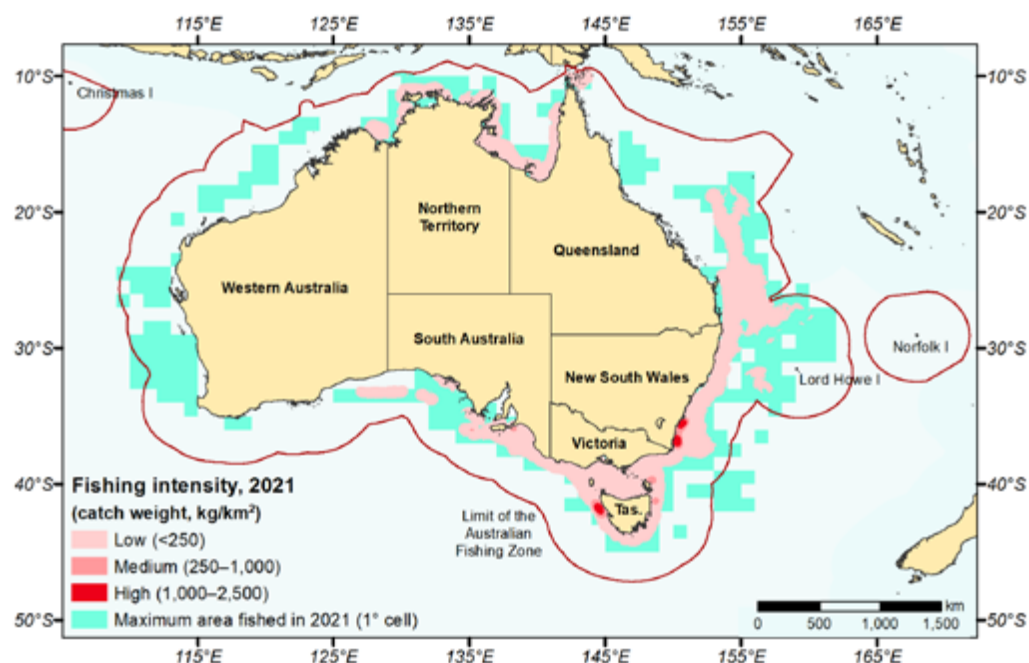
### Fishing intensity

ABARES has mapped the catch and maximum area fished in all 22 Australian Government-managed fisheries in 2021 from logbook data (Figure 1.1). Catch intensity (in kilograms of catch per square kilometre), mapped in shades of pink and red, has been filtered to exclude catch from areas where fewer than 5 boats operated during the year. Green areas show the maximum area fished by all fishers, but aggregated by 1-degree (111 km × 111 km) grid cells.

Areas of highest intensity in 2021 were similar to previous years. Peak catches (kg/km<sup>2</sup>) can be seen in the waters off southern New South Wales and off west and north-east Tasmania. Key fisheries operating in these areas include the Small Pelagic Fishery, the Commonwealth Trawl Sector (CTS) of the Southern and Eastern Scalefish and Shark Fishery (SESSF), and the Bass Strait Central Zone Scallop Fishery.

1 Threatened includes vulnerable, endangered and critically endangered.

**FIGURE 1.1** Fishing intensity of all Australian Government-managed fisheries, 2021



*Fishery status reports 2022* is the 27th edition of this product. It assesses:

- biological status for 2021
- economic status for 2020–21
- environmental status in 2021.

## Summary of biological status in 2021

*Fishery status reports 2022* assesses 101 fish stocks across 22 fisheries (100 stocks in *Fishery status reports 2021*); 65 stocks are assessed across 9 fisheries that are managed solely by AFMA on behalf of the Australian Government, and 36 stocks are assessed across 13 fisheries that are managed jointly by the Australian Government and 1 or more other Australian jurisdictions or other countries (Figure 1.2).

The additional stock reported this year follows the splitting of jackass morwong (*Nemadactylus macropterus*) in the Commonwealth Trawl and Scalefish Hook sectors of the SESSF into 2 separate reporting units. In previous years, ABARES reported on a single ‘management unit’ stock comprising 2 biological stocks (eastern and western); however, since these stocks were found to have different statuses in 2021, it was no longer possible to leave them combined as a single reporting unit.

For fishing mortality status in 2021, 81 stocks were classified as not subject to overfishing (77 in 2020), 5 were classified as subject to overfishing (4 in 2020) and 15 were classified as uncertain with regard to fishing mortality (19 in 2020) (Figure 1.3). For biomass status in 2021, 69 stocks were classified as not overfished (69 in 2020), 13 were classified as overfished (11 in 2020) and 19 were classified as uncertain with regard to biomass status (20 in 2020) (Figure 1.4). Biological status for all stocks assessed back to 1992 can be found in Appendix A.

**FIGURE 1.2** Biological status of fish stocks solely or jointly managed by the Australian Government in 2021, by fishery or sector

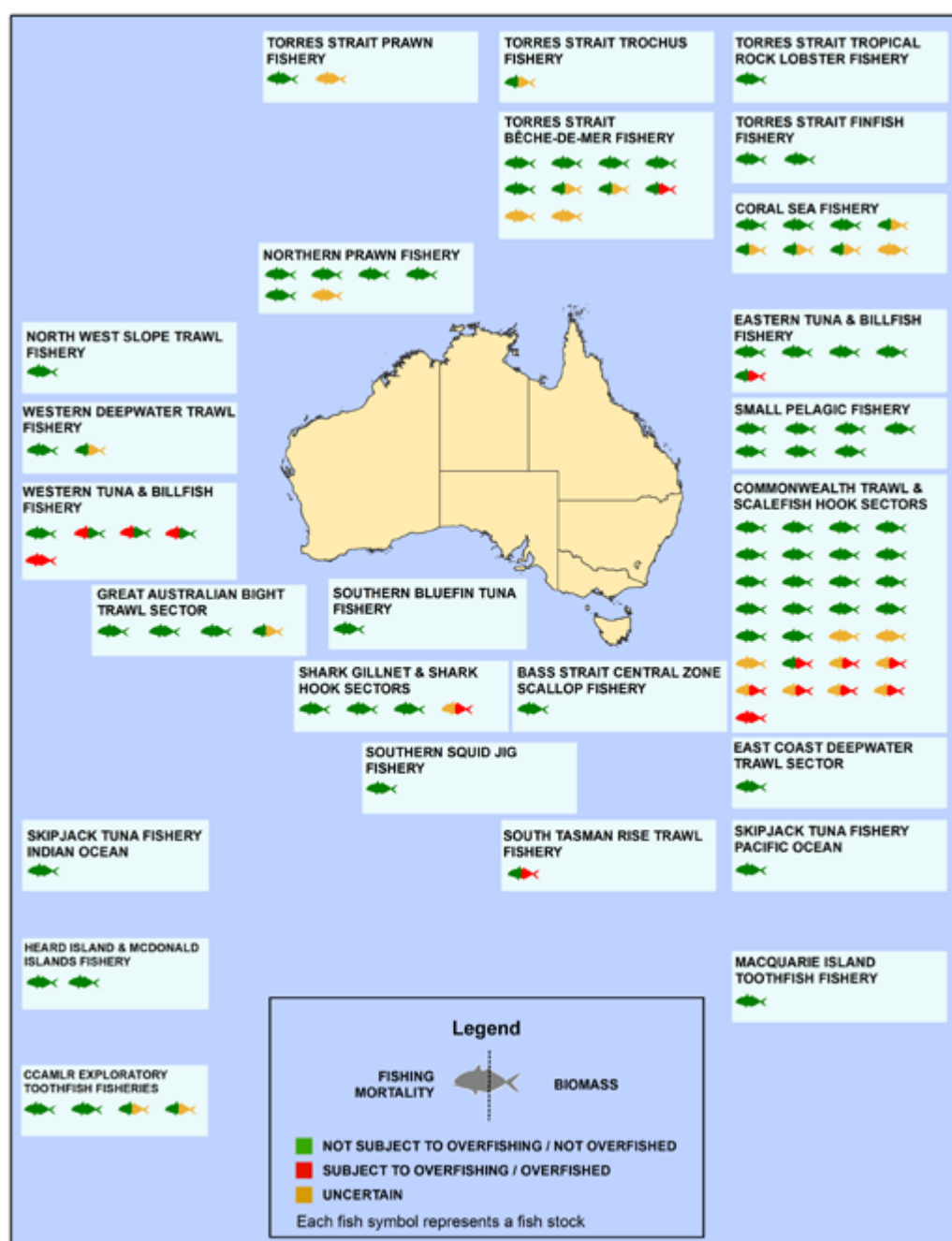


FIGURE 1.3 Fishing mortality status (number of stocks), 2004 to 2021

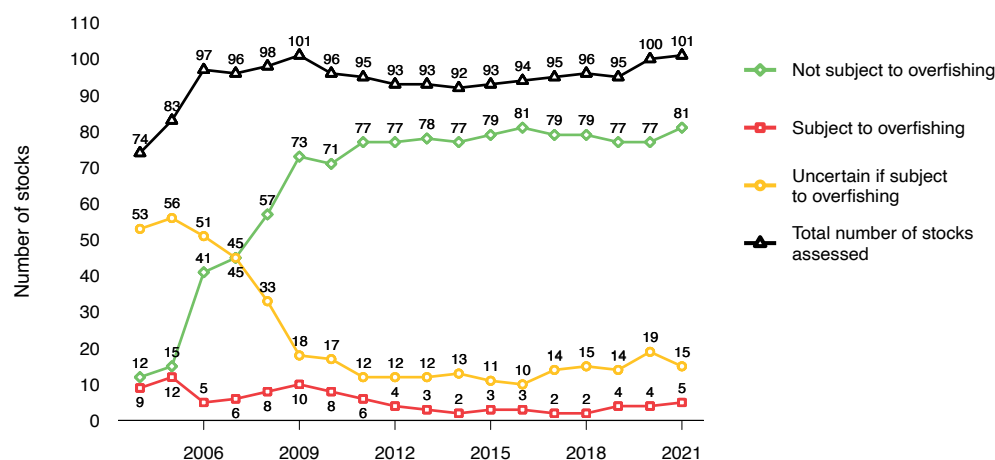
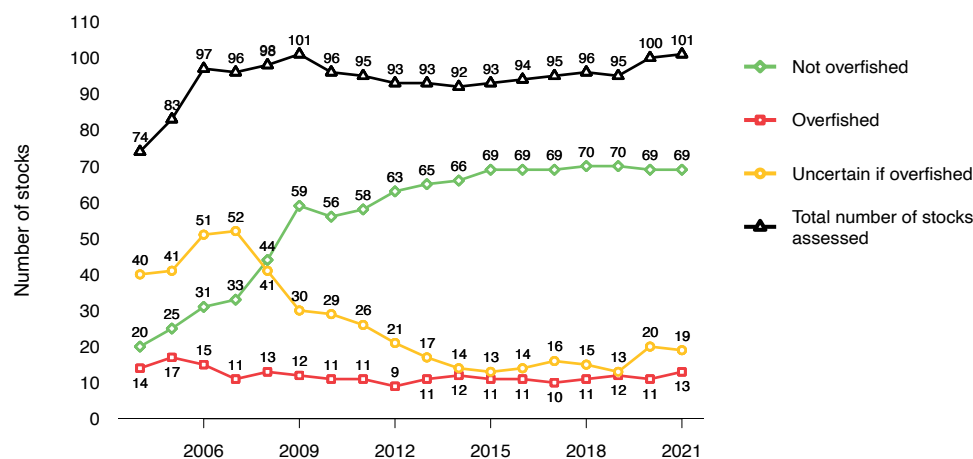


FIGURE 1.4 Biomass status (number of stocks), 2004 to 2021



Stocks that changed status in 2021 (Table 1.1) are:

- black teatfish (*Holothuria whitmaei*), white teatfish (*H. fuscogilva*) and the 'other sea cucumber species' stock (comprising ~11 sea cucumber species) in the Coral Sea Fishery; these 3 stocks changed status from uncertain if subject to overfishing in 2020 to not subject to overfishing in 2021 because there was no catch in 2021
- jackass morwong (eastern zone) in the SESSF, which changed from not overfished and not subject to overfishing in 2020 to overfished and subject to overfishing in 2021 based on new stock assessment information, which found the stock to be below the LRP. This revised understanding of biomass also meant that the total catch in 2021 was too high and unlikely to allow for rebuilding to above the LRP in a timeframe consistent with the requirements of the HSP
- john dory (*Zeus faber*) in the SESSF, which changed from uncertain if subject to overfishing and uncertain if overfished in 2020 to overfished and uncertain if subject to overfishing in 2021. A new and accepted catch rate standardisation and tier 4 analyses in 2021 found the stock to be below the LRP. It was not possible to determine whether the level of fishing mortality in 2021 would allow the stock to rebuild to above the LRP in a timeframe consistent with the requirements of the HSP
- surf redfish (*Actinopyga mauritiana*) in the Torres Strait Bêche-de-mer Fishery (TSBDMF). This stock changed from uncertain if subject to overfishing in 2020 to not subject to overfishing in 2021 because there was no catch in 2021.

Readers are directed to the relevant chapters for a more detailed description of status determination.

**TABLE 1.1** Stocks with a changed status in 2021, their status in 2020 and the reason for their status change

Fishery	Common name (scientific name)	2020		2021		Reason for status change in 2021
		Fishing mortality	Biomass	Fishing mortality	Biomass	
Stocks in fisheries managed solely by the Australian Government						
Coral Sea Fishery (Chapter 3)	Black teatfish ( <i>Holothuria whitmaei</i> )					No commercial catch in 2020–21. Biomass is likely low because of historical exploitation, but it is uncertain whether it is below the LRP.
Coral Sea Fishery (Chapter 3)	White teatfish ( <i>Holothuria fuscogilva</i> )					No commercial catch in 2020–21. Biomass is likely low because of historical exploitation, but it is uncertain whether it is below the LRP.
Coral Sea Fishery (Chapter 3)	Other sea cucumber species (~11 species)					No commercial catch in 2020–21. Uncertain whether biomass is below the LRP.
SESSF: Commonwealth Trawl and Scalefish Hook sectors (Chapter 8)	Jackass morwong (eastern zone) ( <i>Nemadactylus macropterus</i> )					Total catch in 2021–22 was above the level that will allow the stock to rebuild to above the LRP in a time frame consistent with the requirements of the HSP. The most recent estimate of spawning biomass is below the LRP.
SESSF: Commonwealth Trawl and Scalefish Hook sectors (Chapter 8)	John dory ( <i>Zeus faber</i> )					There are no reliable indicators to determine whether current fishing mortality will allow the stock to rebuild to above the LRP in a time frame consistent with the requirements of the HSP. CPUE-based proxy for biomass is below the LRP.
Stocks in fisheries managed jointly by the Australian Government						
Torres Strait Bêche-de- mer Fishery (Chapter 18)	Surf redfish ( <i>Actinopyga mauritiana</i> )					No catch in 2021. Unable to reconcile biomass status with available information.

Notes: **CPUE** Catch-per-unit-effort. **HSP** Harvest Strategy Policy. **LRP** Limit reference point. **SESSF** Southern and Eastern Scalefish and Shark Fishery.

**Fishing mortality** ■ Not subject to overfishing ■ Subject to overfishing ■ Uncertain  
**Biomass** ■ Not overfished ■ Overfished ■ Uncertain

Although most stocks (66 stocks) assessed in Fishery status reports 2022 are classified as both not overfished and not subject to overfishing, a number of stocks have been classified as overfished for a number of years (decades in some instances) and show no demonstrable recovery. These include:

- blue warehou (*Seriotelella brama*), eastern zone gemfish (*Rexea solandri*), gulper sharks (*Centrophorus harrissoni*, *C. moluccensis*, *C. zeehaani*), southern and western zone orange roughy, redfish (*Centroberyx affinis*) and school shark (*Galeorhinus galeus*) in the SESSF
- orange roughy on the South Tasman Rise (STR)
- sandfish (*Holothuria scabra*) in the TSBDMP.



For most of these overfished stocks (excluding redfish in the SESSF, orange roughy on the STR, striped marlin (*Kajikia audax*) in the Eastern Tuna and Billfish Fishery (ETBF) and sandfish in the TSBDMF), it has not been possible to determine whether fishing mortality in 2021 will allow the stock to rebuild to above the LRP in a time frame consistent with the requirements of the HSP. Redfish in the SESSF and striped marlin in the ETBF are the only contemporary examples of stocks that have the necessary information to determine if the level of mortality applied to the stock will allow the stock to rebuild to the LRP in a time frame consistent with the requirements of the HSP. Fisheries for orange roughy on the STR and sandfish in the TSBDMF remain closed and these stocks have been classified as not subject to overfishing in recent years because there has been no catch. Stocks that are classified as overfished and/or subject to overfishing in 2021 are listed in Table 1.2. Readers are directed to the relevant chapters for a detailed description of status determination.

**TABLE 1.2** Stocks classified as subject to overfishing and/or overfished in 2021, their status in 2020 and the reason for their status in 2021

Fishery	Common name (scientific name)	2020		2021		Reason for status in 2021
		Fishing mortality	Biomass	Fishing mortality	Biomass	
Stocks in fisheries managed solely by the Australian Government						
SESSF: Commonwealth Trawl and Scalefish Hook sectors (Chapter 8)	Blue warehou ( <i>Seriolella brama</i> )					There are no reliable indicators to determine whether current fishing mortality will allow the stock to rebuild to above the LRP in a time frame consistent with the requirements of the HSP. CPUE-based proxy for biomass is below the LRP.
SESSF: Commonwealth Trawl and Scalefish Hook sectors (Chapter 8)	Gemfish, eastern zone ( <i>Rexea solandri</i> )					There are no reliable indicators to determine whether current fishing mortality will allow the stock to rebuild to above the LRP in a time frame consistent with the requirements of the HSP. The most recent estimate of spawning biomass is below the LRP.
SESSF: Commonwealth Trawl and Scalefish Hook sectors (Chapter 8)	Gulper sharks ( <i>Centrophorus harrissoni</i> , <i>C. moluccensis</i> , <i>C. zeehaani</i> )					There are no reliable indicators to determine whether current fishing mortality will allow the stock to rebuild to above the LRP in a time frame consistent with the requirements of the HSP. The most recent estimate of biomass is below the LRP.
SESSF: Commonwealth Trawl and Scalefish Hook sectors (Chapter 8)	Jackass morwong (eastern zone) ( <i>Nemadactylus macropterus</i> ) <b>a</b>					Total catch in 2021–22 was above the level that will allow the stock to rebuild to above the LRP in a time frame consistent with the requirements of the HSP. The most recent estimate of spawning biomass is below the LRP.

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**TABLE 1.2** Stocks classified as subject to overfishing and/or overfished in 2021, their status in 2020 and the reason for their status in 2021 continued

Fishery	Common name (scientific name)	2020		2021		Reason for status in 2021
		Fishing mortality	Biomass	Fishing mortality	Biomass	
SESSF: Commonwealth Trawl and Scalefish Hook sectors (Chapter 8)	John dory ( <i>Zeus faber</i> )					There are no reliable indicators to determine whether current fishing mortality will allow the stock to rebuild to above the LRP in a time frame consistent with the requirements of the HSP. CPUE-based proxy for biomass is below the LRP.
SESSF: Commonwealth Trawl and Scalefish Hook sectors (Chapter 8)	Orange roughy, southern zone ( <i>Hoplostethus atlanticus</i> )					There are no reliable indicators to determine whether current fishing mortality will allow the stock to rebuild to above the LRP in a time frame consistent with the requirements of the HSP. The most recent estimate of spawning biomass is below the LRP.
SESSF: Commonwealth Trawl and Scalefish Hook sectors (Chapter 8)	Orange roughy, western zone ( <i>Hoplostethus atlanticus</i> )					There are no reliable indicators to determine whether current fishing mortality will allow the stock to rebuild to above the LRP in a time frame consistent with the requirements of the HSP. The most recent estimate of spawning biomass is below the LRP.
SESSF: Commonwealth Trawl and Scalefish Hook sectors (Chapter 8)	Redfish ( <i>Centroberyx affinis</i> )					Total catch is below the level estimated to allow recovery to the LRP in a time frame consistent with the requirements of the HSP. Estimated spawning biomass is below the LRP.
SESSF: Shark gillnet and shark hook sectors (Chapter 11)	School shark ( <i>Galeorhinus galeus</i> )					Uncertain if fishing mortality in 2021–22 will allow recovery within the specified time frame. Biomass is likely to still be below the LRP.
<b>Stocks in fisheries managed jointly by the Australian Government</b>						
Torres Strait Bêche-de- mer Fishery (Chapter 18)	Sandfish ( <i>Holothuria scabra</i> )					No reported catch in 2021. Last full survey (2010) indicated that stock was overfished.
Eastern Tuna and Billfish Fishery (Chapter 20)	Striped marlin ( <i>Kajikia audax</i> ), south-west Pacific					Current fishing mortality rate is below $F_{MSY}$ . Most recent estimate (2019) indicates that spawning biomass is below the default LRP.

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**TABLE 1.2** Stocks classified as subject to overfishing and/or overfished in 2021, their status in 2020 and the reason for their status in 2021 *continued*

Fishery	Common name (scientific name)	2020		2021		Reason for status in 2021
		Fishing mortality	Biomass	Fishing mortality	Biomass	
Western Tuna and Billfish Fishery (Chapter 23)	Striped marlin ( <i>Kajikia audax</i> )					Current fishing mortality rate exceeds that required to produce MSY. Most recent estimates of biomass (2021) indicate that the stock is below the default Commonwealth LRP.
Western Tuna and Billfish Fishery (Chapter 23)	Albacore ( <i>Thunnus alalunga</i> )					Current fishing mortality rate is above that required to produce MSY. Most recent estimate of spawning biomass (2019) is above the default Commonwealth LRP.
Western Tuna and Billfish Fishery (Chapter 23)	Bigeye tuna ( <i>Thunnus obesus</i> )					Current fishing mortality rate is above that required to produce MSY. Most recent estimate of spawning biomass (2019) is above the default Commonwealth LRP.
Western Tuna and Billfish Fishery (Chapter 23)	Yellowfin tuna ( <i>Thunnus albacares</i> )					Current fishing mortality rate is above that required to produce MSY. Most recent estimate of spawning biomass (2021) is above the default Commonwealth LRP.
South Tasman Rise (Chapter 27)	Orange roughy ( <i>Hoplostethus atlanticus</i> )					Fishery has been closed under domestic arrangements since 2007 as a result of stock depletion.

**a** Jackass morwong in the SESSF was split into 2 separate reporting units in 2021. Previously, ABARES reported on a single 'management unit' stock comprising 2 biological stocks (eastern and western). However, these 2 stocks were found to have different statuses in 2021, so it was no longer possible to leave them combined as a single reporting unit.

Notes: **CPUE** Catch-per-unit-effort. **F<sub>MSY</sub>** Fishing mortality at MSY. **HSP** Harvest Strategy Policy. **LRP** Limit reference point. **MSY** Maximum sustainable yield. **SESSF** Southern and Eastern Scalefish and Shark Fishery.

**Fishing mortality** ■ Not subject to overfishing ■ Subject to overfishing ■ Uncertain  
**Biomass** ■ Not overfished ■ Overfished ■ Uncertain

In 2021, 17 stocks (some of which are multispecies stocks) have been classified as uncertain for fishing mortality status and/or biomass status for some time – 5 or more years (see Table 1.3) – and information about these stocks does not appear to be improving to the point where reconciliation of status is possible.

A larger number of stocks are currently classified as uncertain but have not had this status for 5 or more years. These stocks include deepwater redfish (*Actinopyga echinites*), hairy blackfish (*A. miliaris*) and surf redfish in the TSBDMF, and toothfish (*Dissostichus eleginoides*, *D. mawsoni*) in division 58.4.2 of the CCAMLR exploratory toothfish fisheries. Furthermore, there are stocks for which status has been determined in 2021 but for which it is increasingly difficult to maintain a categorical determination (for example, ocean jacket – *Nelusetta ayraud*, silver trevally – *Pseudocaranx georgianus* and elephantfish – *Callorhynchus milii* in the SESSF). As discussed in section 1.6 of *Fisheries status reports 2021*, this reflects a pattern of increasing uncertainty in the information base that supports status determination and, ultimately, decision-making in Australian Government-managed fisheries.

**TABLE 1.3** Stocks classified as uncertain for fishing mortality or biomass status for more than 5 years

Fishery	Common name (scientific name)	Status in 2021		Year first classified as uncertain	
		Fishing mortality	Biomass	Fishing mortality	Biomass
Coral Sea Fishery (Chapter 3)	White teatfish ( <i>Holothuria fuscogilva</i> )			n/a	2004
Coral Sea Fishery (Chapter 3)	Other sea cucumber species (~11 species)			n/a	2004
Coral Sea Fishery (Chapter 3)	Line Sector (numerous finfish and shark species)			2004	2004
Northern Prawn Fishery (Chapter 4)	Red endeavour prawn ( <i>Metapenaeus ensis</i> )			1994	1994
SESSF: Commonwealth Trawl and Scalefish Hook sectors (Chapter 8)	Blue warehou ( <i>Seriola lalandi</i> )			2011	n/a
SESSF: Commonwealth Trawl and Scalefish Hook sectors (Chapter 8)	Deepwater sharks, eastern zone (up to 18 species)			2018	2010
SESSF: Commonwealth Trawl and Scalefish Hook sectors (Chapter 8)	Deepwater sharks, western zone (up to 18 species)			2018	2010
SESSF: Commonwealth Trawl and Scalefish Hook sectors (Chapter 8)	Gemfish, eastern zone ( <i>Rexia solandri</i> )			2013	n/a
SESSF: Commonwealth Trawl and Scalefish Hook sectors (Chapter 8)	Gulper sharks ( <i>Centrophorus harrissoni</i> , <i>C. moluccensis</i> , <i>C. zeehaani</i> )			2012	n/a
SESSF: Commonwealth Trawl and Scalefish Hook sectors (Chapter 8)	Other oreodories ( <i>Neocyttus rhomboidalis</i> , <i>Allocyttus niger</i> , <i>A. verrucosus</i> , <i>Oreosoma atlanticum</i> )			2017	2020
SESSF: Great Australian Bight Trawl Sector (Chapter 10)	Orange roughy ( <i>Hoplostethus atlanticus</i> )			n/a	1992
SESSF: Shark gillnet and shark hook sectors (Chapter 11)	School shark ( <i>Galeorhinus galeus</i> )			2013	n/a
Western Deepwater Trawl Fishery (Chapter 13)	Deepwater bugs ( <i>Ibacus</i> spp.)			n/a	2004
Torres Strait Prawn Fishery (Chapter 17)	Blue endeavour prawn ( <i>Metapenaeus endeavouri</i> )			2017	2017
Torres Strait Bêche-de-mer Fishery (Chapter 18)	Other sea cucumbers (up to 18 species)			2017	2006
Torres Strait Trochus Fishery (Chapter 18)	Trochus ( <i>Trochus niloticus</i> )			n/a	2004
CCAMLR exploratory toothfish fisheries (division 58.4.1)	Toothfish ( <i>Dissostichus eleginoides</i> , <i>D. mawsoni</i> )			n/a	2016

Notes: **CCAMLR** Commission for the Conservation of Antarctic Marine Living Resources. **n/a** Not applicable. **SESSF** Southern and Eastern Scalefish and Shark Fishery.

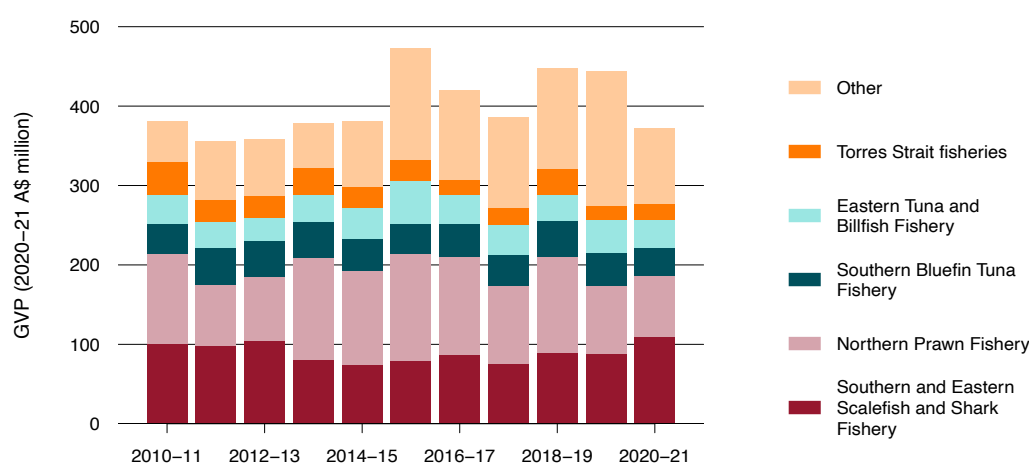
**Fishing mortality**   ■ Not subject to overfishing   ■ Subject to overfishing   ■ Uncertain  
**Biomass**   ■ Not overfished   ■ Overfished   ■ Uncertain

## Summary of economic status in 2020–21

*Fishery status reports 2022* assesses the economic status of all fisheries managed solely and jointly by the Australian Government in 2020–21. These fisheries generated an estimated GVP of \$374 million in 2020–21, accounting for 27% of wild-catch fisheries GVP in Australia (\$1.39 billion).<sup>2</sup> In assessing fisheries' economic status, the availability of data differs for each fishery, including whether an estimate of NER and/or GVP is available and whether a fishery is managed to an MEY objective.

The 2020–21 GVP for Australian Government–managed fisheries was dominated by production from 4 major fisheries that together accounted for 69% of the total GVP. The multisector SESSF was the most valuable fishery, with a GVP of \$109.7 million (29% contribution). The Northern Prawn Fishery (NPF) also made a large contribution to overall GVP, reaching \$76.63 million (21% contribution) in 2020–21. The wild-catch sector of the Southern Bluefin Tuna Fishery and the ETBF generated fishery-level GVP of \$35.6 million (10% contribution) and \$35.5 million (9% contribution), respectively (Figure 1.5).

**FIGURE 1.5** Gross value of production of fisheries managed solely or jointly by the Australian Government, 2010–11 to 2020–21



Notes: **GVP** Gross value of production.

Major fisheries jointly managed by the Australian Government include the Southern Bluefin Tuna Fishery, the ETBF and the Torres Strait Tropical Rock Lobster Fishery. Combined, these 3 fisheries generated a GVP of \$84.7 million and accounted for more than half of the GVP of all jointly managed fisheries in 2020–21.

ABARES undertakes regular economic surveys of the most valuable fisheries managed solely by the Australian Government, including the CTS; the Gillnet, Hook and Trap Sector (GHTS) of the SESSF; and the NPF. These fisheries are managed under MEY objectives. Together, they accounted for 82% of the GVP of all solely Australian Government–managed fisheries in 2020–21.

A summary of economic status, drawing on available indicators for each fishery, is shown in Table 1.4. Further details are in Appendix B.

<sup>2</sup> GVP figures are subject to revision, and consequently may differ in past and future publications.

**TABLE 1.4** Summary of economic status of Australian Government-managed fisheries, 2020–21

Fishery	Economic status
Bass Strait Central Zone Scallop Fishery	Recent estimates of NER are not available. Increased biomass in recent years and a conservatively set TAC suggest that NER are likely positive and improving, given increasing average GVP per active vessel.
Coral Sea Fishery	NER for the Aquarium Sector of the fishery are likely high, given a low level of latency for the number of fish caught. High latent effort across the different non-aquarium sectors persists, indicating low NER. The current low-cost approach to management of both sectors, with input and output controls, including triggers, appears appropriate.
Northern Prawn Fishery	Most recent estimates of NER, though still positive, show a deterioration in economic returns. Tiger prawn stocks have become a watch point for the fishery, with the most recent estimates showing declining spawning sizes. The impact of the declining trend in tiger prawn catch since 2015 on future levels of NER is uncertain and warrants further monitoring. ITEQs for tiger prawns allow effort quota to flow to highest-value use, and help the fishery adjust to challenging economic conditions.
North West Slope Trawl Fishery	NER are likely to be low in an environment of relatively low catch and relatively high operating costs.
Small Pelagic Fishery	Increasing TAC over the past decade, combined with lower TAC latency in recent years, indicates that the fishery is likely to be generating positive NER. ITQs and a tier-based approach to setting TACs appear appropriate.
SESSF: Commonwealth Trawl and Scalefish Hook sectors <b>a</b>	Most recent estimates of NER for 2017–18 and 2018–19 were near zero and driven in part by declining terms of trade. The 5 most valuable stocks (pink ling [2 stocks], orange roughy [east], blue grenadier and flathead) combined constituted 79% of the sectors' combined GVP in 2020–21. Stocks of blue grenadier and pink ling (west) are significantly above their $B_{MEY}$ targets, and the other 3 stocks are between $B_{LIM}$ and $B_{MEY}$ .
SESSF: East Coast Deepwater Trawl Sector	No fishing effort in 2021–22 suggests operators do not expect to make a positive return from fishing in the fishery.
SESSF: Great Australian Bight Trawl Sector	A downward trend in GVP over the decade has corresponded with a period of high quota latency. Bight redfish stock is above the target, and deepwater flathead is below but nearing target. NER are likely to be low.
SESSF: Shark Hook and Shark Gillnet sectors <b>b</b>	Most recent estimates of NER for 2018–19 are positive and have been on an increasing trend since 2013–14. Gummy shark stock is at or above its $B_{MEY}$ target. Biomass of school shark requires rebuilding. ITQs have helped to facilitate improved economic productivity.
Southern Squid Jig Fishery	Estimates of NER are not available. Lower fishing effort, catch and GVP over the last decade, along with high latent effort, suggest limited incentive to fish and low NER. Current management arrangements, which include triggers, are appropriate to maintain low management costs until effort increases.
Western Deepwater Trawl Fishery	NER are likely to be low in an environment of very low fishing effort.
Torres Strait Finfish Fishery	The key objectives of the fishery are based on socio-economic outcomes. Catch has been relatively stable in the last decade, and leasing revenue for the Traditional Inhabitant Sector has increased recently.
Torres Strait Tropical Rock Lobster Fishery	Economic status of the fishery is uncertain. Real GVP declined over the period 2010–11 to 2020–21, with the decline being driven by lower catch volumes. Although rock lobster prices increased in the early part of this period, supporting GVP, prices declined sharply after the onset of the COVID-19 pandemic in early 2020.
Torres Strait Prawn Fishery	Recent estimates of NER are not available. High latent effort due to prevailing market conditions suggests NER for the fishery are likely low. Biomass for the key target species – brown tiger prawn – is relatively high. The low-cost approach to managing fishing effort with triggers appears appropriate.
Torres Strait Bêche-de-mer and Trochus fisheries	Estimates of NER are not available. The current management approach, which, among other things, provides for TACs and community involvement in the management of fishery resources within the context of a conservative harvest strategy, is appropriate.
Eastern Tuna and Billfish Fishery	NER are positive and increasing in an environment of relatively stable biomass over the past 2 decades. Productivity improvements are likely driven by a smaller fleet and ITQs. Evidence suggests that NER are not being dissipated through overcapitalisation or overfishing of the fish stocks.
Skipjack Tuna Fishery	No recent fishing. Historical fishing has been opportunistic, and highly dependent on availability and the domestic cannery market. In the absence of recent fishing, the current low-cost management approach is appropriate.
Southern Bluefin Tuna Fishery	NER are likely to be positive in an environment of low latency and positive lease prices for quota in a fishery managed with ITQs. Higher stock levels in recent years are likely to improve NER. Further stock rebuilding will ensure that the fishery's overall economic performance will continue to improve.

continued...

**TABLE 1.4** Summary of economic status of Australian Government–managed fisheries, 2020–21 continued

Fishery	Economic status
Western Tuna and Billfish Fishery	NER are likely low due to low fishing effort and high latent effort.
Heard Island and McDonald Islands Fishery	Estimates of NER are not available. The primary target species, Patagonian toothfish, has historically low levels of latency and a high landing value, indicating positive NER for the fishery. NER likely declined in 2020 and 2021 due to the impact of the COVID-19 pandemic on the demand for toothfish, with likely short-term negative impacts on NER. A precautionary approach to the management of the stock, the setting of TACs under ITQs and stocks close to their target biomass levels should ensure that NER remain positive over the longer term.
Macquarie Island Toothfish Fishery	Estimates of NER are not available. The primary target species, Patagonian toothfish, has historically low levels of latency and a high landed value, indicating positive NER for the fishery. NER likely declined in 2020 and 2021 due to the impact of the COVID-19 pandemic on the demand for and supply of toothfish, with likely short-term negative impacts on NER. A precautionary approach to the management of the stock, the setting of TACs under an ITQ and target stock above the target biomass level should ensure that NER remain positive over the longer term.
CCAMLR exploratory toothfish fisheries	Fishery is developmental, with fishing sporadic and opportunistic. The species caught in CCAMLR fisheries are typically high value, with potential to generate positive NER. A precautionary approach until further scientific knowledge is generated appears appropriate.

**a** NER estimates and management costs are only available for the CTS and exclude the Scalefish Hook Sector. **b** NER estimates and management costs are only available for the GHTS, which includes Scalefish Hook Sector catches and gillnet scalefish catches. Statistics are provided by financial year.

Notes: **B<sub>LIM</sub>** Biomass limit reference point. **B<sub>MEY</sub>** Biomass at maximum economic yield. **CCAMLR** Commission for the Conservation of Antarctic Marine Living Resources. **CTS** Commonwealth Trawl Sector. **GHTS** Gillnet, Hook and Trap Sector. **GVP** Gross value of production. **ITEQ** Individual transferable effort quota. **ITQ** Individual transferable quota. **NER** Net economic returns. **SESSF** Southern and Eastern Scalefish and Shark Fishery. **TAC** Total allowable catch. The South Tasman Rise Trawl Fishery is not shown because it has been closed since 2007.

## Summary of environmental status in 2021

*Fishery status reports 2022* reviews and reports on available information pertaining to the environmental status of fisheries managed solely and jointly by the Australian Government in 2021.

### Approvals under the EPBC Act

All Australian Government–managed fisheries have been accredited under part 13 of the EPBC Act and many have been assessed for export approval under part 13A; details for each fishery are provided in Table 1.5. Readers are directed to relevant chapters in *Fishery status reports 2022* for further detail on approvals under the EPBC Act.

### Ecological risk assessment

All Australian Government–managed fisheries have undertaken some form of ERA. The level and frequency of these assessments is partly determined by the size and complexity of the fishery, and partly by the risks identified at lower levels in the ERA hierarchy (Hobday et al. 2007) alongside changes or evolutions in activity in the fishery.

Appendix C provides a summary of the ERAs (level and year) of each fishery/sector, including the number of species assessed and the species found to be at greater than or equal to high risk from the impacts of fishing. ABARES notes that bycatch and discard workplans and/or ERM plans are in place in most, if not all fisheries, and that these are intended to mitigate the risks identified by ERAs. *Fishery status reports 2022* does not include an evaluation of AFMA's ERM responses (that is, their likely effectiveness in mitigating identified risks), but future *Fishery status reports* may.

Readers are directed to relevant chapters in *Fishery status reports 2022* for further details on these elements of the management of Australian Government–managed fisheries.

**TABLE 1.5** Approvals under the EPBC Act for each Australian Government–managed fishery

Fishery	Part 13 accreditation	Part 13A export approval
Bass Strait Central Zone Scallop Fishery (Chapter 2)	From 2 October 2016	Until 9 October 2026
Coral Sea Fishery (Chapter 3)	From 7 January 2021	Until 6 January 2024
Northern Prawn Fishery (Chapter 4)	From 9 January 2019	Until 6 January 2024
North West Slope Trawl Fishery (Chapter 5)	From 15 December 2020	Until 30 November 2023
Small Pelagic Fishery (Chapter 6)	From 26 June 2020	Until 21 October 2023
Southern and Eastern Scalefish and Shark Fishery (Chapters 7–11)	From 11 February 2022	Until 12 February 2025
Southern Squid Jig Fishery (Chapter 12)	From 2 October 2016	Until 9 October 2026
Western Deepwater Trawl Fishery (Chapter 13)	From 15 December 2020	Until 30 November 2023
Torres Strait Finfish Fishery (Chapter 15)	From 23 December 2020	Until 1 November 2023
Torres Strait Tropical Lobster Fishery (Chapter 16)	From 7 January 2019	Until 4 December 2023
Torres Strait Prawn Fishery (Chapter 17)	From 20 December 2017	Until 9 October 2026
Torres Strait Bêche-de-mer and Trochus fisheries (Chapter 18)	Bêche-de-mer fishery: from 23 December 2020; trochus fishery: from 20 November 2017	Bêche-de-mer fishery: until 30 November 2023; trochus fishery: until 9 October 2026
Eastern Tuna and Billfish Fishery (Chapter 20)	From 19 August 2022	Until 19 August 2025
Skipjack Tuna Fishery (Chapter 21)	From 2 October 2016	Until 9 October 2026
Southern Bluefin Tuna Fishery (Chapter 22)	From 7 November 2022	Until 11 November 2025
Western Tuna and Billfish Fishery (Chapter 23)	From 10 November 2022	Until 11 November 2025
Heard Island and McDonald Islands Fishery (Chapter 24)	From 2 October 2016	Until 9 October 2026
Macquarie Island Toothfish Fishery (Chapter 25)	From 2 October 2016	Until 9 October 2026
CCAMLR exploratory toothfish fisheries (Chapter 26)	From 26 November 2020	Until 27 November 2025
High-seas fisheries for non–highly migratory species (Chapter 27)	From 14 May 2018	Until 9 October 2026

Note: **CCAMLR** Commission for the Conservation of Antarctic Marine Living Resources.

Source: Department of Climate Change, Energy, the Environment and Water website

### Interactions with listed species

Under the EPBC Act, commercial fishers operating in Australian Government–managed fisheries are required to report all interactions with species listed as protected, migratory and/or threatened<sup>3</sup> to the Department of Climate Change, Energy, the Environment and Water (DCCEEW). In this context, the Bycatch Policy (Department of Agriculture and Water Resources 2018a) defines an interaction as ‘any physical contact between a species and a fishing operation and includes all catch, and any discards or releases. Collisions (that is, an animal that makes contact with the fishing operation but is not caught) are also considered to be interactions.’

As a mechanism to support reporting to DCCEEW, commercial fishers are required to report interactions to AFMA in specified logbooks. AFMA then summarise these reported interactions and provides them to DCCEEW every quarter. These quarterly summaries are also published on the AFMA website.

Each year, ABARES reports on the level of logbook-reported interactions with species listed as protected, migratory and/or threatened in each chapter of the *Fishery status reports*. ABARES has summarised these reported interactions across fisheries as a time series for the first time in *Fishery status reports 2022* (Table 1.6). However, considerable caution must be exercised in interpreting these data, since:

- they represent data aggregated across all Australian Government–managed fisheries
- data from each Australian Government–managed fishery are subject to differing degrees of validation

3 Threatened includes, vulnerable, endangered and critically endangered.



- changes or patterns in fisher-reported catches of these species could reflect either changes in actual interactions or changes in fisher reporting of those interactions, and this will likely vary between fishers and fisheries.

These data are therefore of limited value in determining, with certainty, the overall level of interaction with species listed as protected, migratory and/or threatened in Australian Government-managed fisheries.

A limited number of Australian Government-managed fisheries have implemented comprehensive, representative and ongoing independent data collection programs that can verify logbook reporting of interactions with listed species. In recent years, this has mainly occurred through electronic monitoring (e-monitoring), acknowledging that there are also a number of fisheries (for example, Heard Island and McDonald Islands, and Macquarie Island) that have delivered high levels of monitoring using independent observers.

For fisheries with e-monitoring (the ETBF and the GHTS of the SESSF), research has demonstrated that its introduction in 2015 was associated with an increase in fisher-reported interactions with listed species (alongside improvements in reporting rates for some non-listed species) (Emery et al. 2019).

Outside these fisheries, the accuracy and independent verification of interactions are variable (including in some major fisheries or sectors such as the CTS of the SESSF and the NPF). Independent verification should be improved across these fisheries to ensure that AFMA has reliable data to inform decisions, so that it can meet its legislative and policy requirements relating to listed species.

It is encouraging to note that AFMA has recently been appropriated \$10.1 million over 4 years to roll out e-monitoring technology into its other major fisheries. Successful implementation of this program is critical to ensuring that AFMA can establish a reliable information base about fishery interactions with listed species. The introduction of e-monitoring is also likely to lead to improvements in data collection for other species (Emery et al. 2019) and improved compliance with fisheries rules.

**TABLE 1.6** Interactions in Australian Government-managed fisheries with species listed as protected, migratory and/or threatened under the EPBC Act, by species group, 2012 to 2021

Species group	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Albatross	27	35	26	48	63	72	125	125	37	35
Birds – other	3	1	3	6	34	22	34	22	38	28
Petrels, prions and shearwaters	192	58	12	48	120	70	115	63	219	48
Dugong	0	0	0	0	0	1	0	0	0	0
Pelagic rays	0	0	0	0	1	0	0	0	3	5
Sawfish	476	506	477	308	314	510	621	435	1,235	1,349
Sea snakes	9,219	9,479	9,019	8,204	9,123	9,325	11,771	8,928	13,866	14,207
Seahorses and pipefish	410	222	28	140	588	51	170	85	109	88
Seals and sealions	222	266	162	155	213	192	324	253	241	301
Sharks – migratory <b>a</b>	3,517	2,475	2,031	2,630	2,527	3,375	2,562	2,006	1,766	544
Sharks – threatened <b>b</b>	8	8	22	15	14	26	29	20	15	16
Turtles	89	94	78	118	165	281	265	251	214	275
Whales and dolphins	21	13	23	49	51	114	83	83	73	75

**a** Includes species listed as migratory under the EPBC Act. Some of these species, predominantly mako sharks, can be landed under certain circumstances.

**b** Sharks listed as threatened under the EPBC Act, including white sharks, grey nurse sharks, whale sharks and hammerheads.

Source: AFMA quarterly reports (AFMA website)

## 1.4 Current and emerging issues

This section of the *Fisheries status reports* was established in 2021 and described, at the time, issues that present challenges to ABARES in reliably determining biological stock status (specifically whether stocks are above or below key biological reference points) and that impact the ability of AFMA to pursue and demonstrate performance against legislative and policy requirements relating to ecological sustainability.

Section 1.6 of *Fisheries status reports 2021* describes a range of issues and uncertainties associated with demonstrable recovery of overfished stocks, insufficient data to inform assessments, ageing assessments, climate change and improving bycatch monitoring and reporting. ABARES considers these issues to still be relevant today.

While the ongoing, and extensive investment in research and data collection in Australian Government-managed fisheries is acknowledged, the information requirements to demonstrably deliver on legislative and policy requirements across 22 fisheries, 101 assessed stocks and more than 2,000 bycatch species, alongside associated habitats and ecological communities, are considerable. Ready access to the necessary data (quality and quantity) and to the appropriate expertise to turn that data into information to inform management is needed. If these needs are not met, the issues and uncertainties discussed in *Fisheries status reports 2021* are unlikely to be mitigated. Furthermore, with time, it is likely that these issues will get worse and the implications more pronounced.

To address this issue for relevant fisheries, ABARES considers that there needs to be either increased investment in fisheries data collection, monitoring and research, or a demonstrable reduction in the level of risk posed by fishing. In some cases, a combination of both may be required. While reducing catch and/or effort for some species may reduce risk, a base level of information to demonstrate performance against legislative and policy requirements is still required. For historically overfished stocks, reductions in catch and effort (or risk) are unlikely to deliver the evidence to demonstrate that the stock will rebuild in a time frame consistent with the requirements of the HSP. This is because the fisheries-dependent data arising from low catch-and-effort scenarios are unlikely to be sufficient to support assessments that can produce the outputs required to demonstrate recovery. Fishery-independent data are likely to be required, but acquiring these data can be costly. Since a significant proportion of current fishery management costs are recovered from the fishing industry, the low profits likely being earned directly from historically overfished stocks makes it difficult for industry to justify the necessary expenditure on data, monitoring and research. The upcoming review of the HSP is an opportunity for the Australian Government to begin to consider the appropriate balance of risk and the costs of fisheries management, and who should pay for fisheries research.

## 1.5 References

AFMA 2017, *Guide to AFMA's ecological risk management (June 2017)*, Australian Fisheries Management Authority, Canberra.

Australian Government 1989, *New directions for Commonwealth fisheries management in the 1990s: a government policy statement*, Australian Government, Canberra.

Department of Agriculture and Water Resources 2018a, *Commonwealth fisheries bycatch policy*, Department of Agriculture and Water Resources, Canberra.

—2018b, *Commonwealth fisheries harvest strategy policy*, Department of Agriculture and Water Resources, Canberra.

Emery, TJ, Noriega, R, Williams, AJ & Larcombe, J 2019, 'Changes in logbook reporting by commercial fishers following the implementation of electronic monitoring in Australian Commonwealth fisheries', *Marine Policy*, vol. 104, pp. 135–45.

Hobday, AJ, Smith, A, Webb, H, Daley, R, Wayte, S, Bulman, C, Dowdney, J, Williams, A, Sporcic, M, Dambacher, J, Fuller, M & Walker, T 2007, *Ecological risk assessment for effects of fishing: methodology*, report R04/1072 for AFMA, Australian Fisheries Management Authority, Canberra.