

## Chapter 14

# Western Deepwater Trawl Fishery

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**FIGURE 14.1** Area fished in the Western Deepwater Trawl Fishery, 2019–20 fishing season

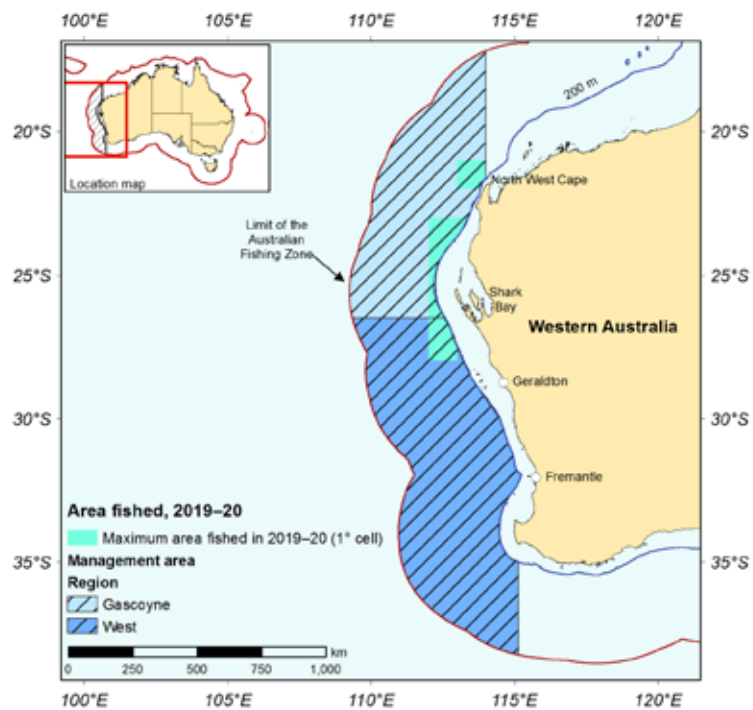


TABLE 14.1 Status of the Western Deepwater Trawl Fishery

Biological status					
Stock	2019		2020		Comments
	Fishing mortality	Biomass	Fishing mortality	Biomass	
Deepwater bugs ( <i>Ibacus</i> spp.)					Fishing mortality levels are unlikely to constitute overfishing. No reliable estimate of biomass.
Ruby snapper ( <i>Etelis</i> sp.)					Fishing mortality levels are unlikely to constitute overfishing. Biomass likely to be above the limit reference point.

Economic status

NER are likely to be low in an environment of very low fishing effort.

Note: NER Net economic returns.

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

14.1 Description of the fishery

Area fished, fishing methods and key species

The Western Deepwater Trawl Fishery (WDTF) operates in Commonwealth waters off the coast of Western Australia between the western boundary of the Southern and Eastern Scalefish and Shark Fishery in the south (115°08'E) and the western boundary of the North West Slope Trawl Fishery (NWSTF) in the north (114°E) (Figure 14.1). Effort in recent years has been localised in the area offshore and slightly south of Shark Bay.

Operators in the fishery use demersal trawl, and catch more than 50 species in waters seaward of a line approximating the 200 m isobath, in habitats ranging from temperate–subtropical in the south to tropical in the north. Catches in the WDTF were historically dominated by 6 commercial finfish species or species groups: orange roughy (*Hoplostethus atlanticus*), oreos (*Oreosomatidae*), boarfish (*Pentacerotidae*), eteline snapper (*Lutjanidae: Etelinae*), apsiline snapper (*Lutjanidae: Apsilinae*) and sea bream (*Lethrinidae*). Between 2000 and 2005, deepwater bugs (*Ibacus* spp.) emerged as the most important target species. A wide variety of species have variably made up the catch since then, with deepwater bugs and ruby snapper (*Etelis* sp.) dominating recent catches. Other species consistently reported in the catch since 2000 include other snappers (predominantly tangs snapper – *Lipocheilus carnolabrum*, rosy snapper – *Pristipomoides filamentosus* and flame snapper – *Etelis coruscans*), deepwater flathead (*Neoplatycephalus contatus*), scampi (mixed), amberjack (*Seriola dumerili*), bar rockcods (*Epinephelus ergastularius* and *E. septemfasciatus*), mirror dory (*Zenopsis nebulosus*) and gemfish (*Rexea solandri*) (Figure 14.2).

## Management methods

The fishery is managed under the same harvest strategy as the NWSTF (AFMA 2011; see Chapter 6). Catch triggers are prescribed for 10 species for 2 regions: Gascoyne and West (Table 14.2). Triggers are set for each species, based on the highest historical catch over the period 2000 to 2010 (triggers 1 and 2). A catch-per-unit-effort (CPUE) trigger based on the average CPUE over the period 2000 to 2010 is also prescribed, and is part of trigger 2. The harvest strategy details a suite of management responses when hitting prescribed triggers, which include CPUE analyses, reduction in catch limits and quantitative stock assessment. Orange roughy is also allocated management controls for the West region within the harvest strategy. The 2011 harvest strategy is being reviewed, with a revised strategy expected in mid-2022.

**TABLE 14.2** Triggers in the WDTF, by region

Species	Gascoyne region			West region		
	Trigger 1	Trigger 2		Trigger 1	Trigger 2	
	Max. catch (t)	Max. catch ×2 (t)	CPUE (kg/vessel-day)	Max catch (t)	Max. catch ×2 (t)	CPUE (kg/vessel-day)
Scampi	10	20	118.4	10	20	72
Bugs	100	200	518.9	90	180	390
Boarfish (all species)	5	10	31.3	10	20	113.4
Tang snapper	15	30	97	n/a	n/a	n/a
Ruby snapper	55	110	403	n/a	n/a	n/a
Longtail ruby snapper	10	20	128.2	n/a	n/a	n/a
Deepwater flathead	n/a	n/a	n/a	40	80	468
Gemfish	n/a	n/a	n/a	10	20	93
Mirror dory	n/a	n/a	n/a	5	10	68.2
Smooth dory	n/a	n/a	n/a	5	10	194.1

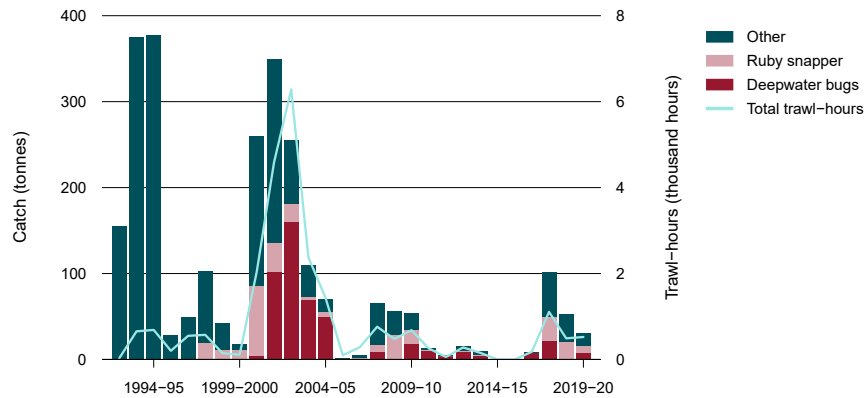
Notes: CPUE Catch-per-unit-effort. n/a Not applicable.

## Fishing activity

In 2019–20, 31 t of catch was landed in the WDTF, down from 53 t in 2018–19. Deepwater bugs made up 26% of the 2019–20 catch (0% in 2018–19), while ruby snapper made up a further 25% (40% in 2018–19; Figure 14.2, Table 14.3). Other species that contributed to the catch in 2019–20 were amberjack and rosy snapper. Annual catch for all species detailed in the harvest strategy were below the trigger limits in 2018–19 and 2019–20.

The number of vessels active in the fishery and total hours trawled have been variable but relatively low since 2005–06. In 2019–20, 524 trawl-hours were recorded in the fishery, down from a recent peak of 1,108 in 2017–18 (Table 14.3). There has been 1–3 active vessels in the fishery since 2004–05.

**FIGURE 14.2** Total catch in the WDTF, 1992–93 to 2019–20 season



Source: AFMA

**TABLE 14.3** Main features and statistics for the WDTF

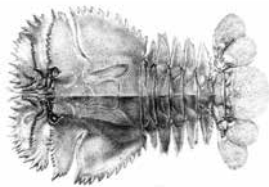
Fishery statistics a		2018–19 fishing season			2019–20 fishing season		
Stock	TAC (t)	Catch (t)	GVP (2018–19)	TAC (t)	Catch (t)	GVP (2019–20)	
Deepwater bugs	n/a	0	Confidential	n/a	8	Confidential	
Ruby snapper	n/a	21	Confidential	n/a	8	Confidential	
<b>Total fishery</b>	<b>n/a</b>	<b>53</b>	<b>Confidential</b>	<b>n/a</b>	<b>31</b>	<b>Confidential</b>	
<b>Fishery-level statistics</b>							
Effort	53 days, 492 trawl-hours			42 days, 524 trawl-hours			
Fishing permits	11			11			
Active vessels	1			1			
Observer coverage	0 days (0%)			0 days (0%)			
Fishing methods	Demersal trawl						
Primary landing ports	Carnarvon, Fremantle (Western Australia)						
Management methods	Input controls: limited entry (11 permits), gear restrictions Catch controls: trigger limits for key commercial species						
Primary markets	Domestic: Brisbane, Perth, Sydney – frozen, chilled International: Japan, Spain, United States – frozen						
Management plan	North West Slope Trawl Fishery and Western Deepwater Trawl Fishery: statement of management arrangements (AFMA 2012)						

a Fishery statistics are provided by fishing season, unless otherwise indicated. Fishing season is 1 July to 30 June. Value statistics are provided by financial year.

Notes: **GVP** Gross value of production. **n/a** Not applicable. **TAC** Total allowable catch.

## 14.2 Biological status

### Deepwater bugs (*Ibacus* spp.)



Line drawing: FAO

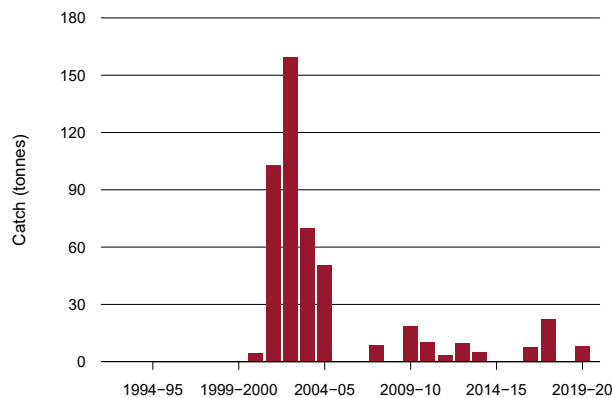
#### Stock structure

The WDTF catches several species of deepwater bugs. Stock structure of these species is not known, and they are grouped into a single multispecies stock for status determination purposes.

#### Catch history

Catch of deepwater bugs in recent years has been relatively localised in the area offshore and slightly south of Shark Bay (see Figure 14.1). Catch in 2019–20 was 8 t. No catch was reported in 2018–19 (Figure 14.3; Table 14.3). Over the past 10 years, deepwater bug catch has peaked in years of increased effort (Figure 14.3). The highest catch recorded since 2010–11 was 22 t in 2017–18, with no catch reported in 2014–15 and 2015–16.

**FIGURE 14.3** Deepwater bug catch in the WDTF, 1992–93 season to 2019–20 season



Source: AFMA

## Stock assessment

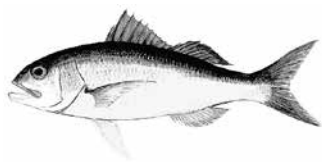
Relatively low levels of fishing effort, low levels of catch and sporadic targeting make it difficult to develop a quantitative stock assessment for deepwater bugs. As a result, no formal stock assessment exists.

## Stock status determination

There is no current or reliable indication of what sustainable catch might be for this stock. However, catch of bugs in the WDTF was below the level of bugs taken on the east coast of Australia, where stocks are considered sustainable (Roelofs et al. 2021; Stewart et al. 2021). Given that recent catches have been relatively low and localised, and catches of the same complex of species in another fishery are substantially higher and considered to be sustainable, the level of catch in the WDTF is considered to be unlikely to drive the stock into an overfished state. On this basis, the stock is classified as **not subject to overfishing**. Few empirical data are available to inform biomass status for this stock; as a result, the level of biomass of the stock is **uncertain**.

## Ruby snapper (*Etelis* sp.)

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Line drawing: FAO

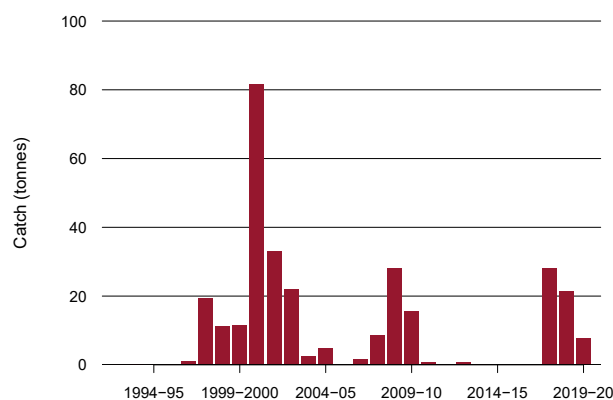
## Stock structure

Four species of *Etelis* are captured in the WDTF, although ruby snapper (*Etelis* sp.) is the most commonly captured. A recent taxonomic revision of ruby snapper revealed 2 morphologically similar species that are now recognised as *Etelis* sp. (ruby snapper) and *Etelis carbunculus* (pygmy ruby snapper) (Andrews et al. 2016; Wakefield et al. 2014; Williams et al. 2017). However, catches for these 2 species are currently reported as a single species, here referred to as ruby snapper (*Etelis* sp.). The stock structure of ruby snapper caught in the WDTF is uncertain. In the absence of clear information on biological stock structure, a single fishery-level stock is assumed for determining status.

## Catch history

Catches of ruby snapper in the WDTF peaked in 2000–01 (around 80 t), with a smaller peak in 2008–09 (around 28 t). Catches were relatively small between 2010–11 and 2016–17, before increasing to 28 t in 2017–18. Catch in 2019–20 was 8 t, down from 21 t in 2018–19 (Figure 14.4).

Catch in 2018–19 and 2019–20 was below the level 1 trigger described in the harvest strategy.

**FIGURE 14.4** Ruby snapper catch in the WDTF, 1992–93 season to 2019–20 season

Source: AFMA

### Stock assessment

The only stock assessment for ruby snapper in the WDTF was published in 2002 (Hunter, Dichmont & Venables 2002). The reliability and accuracy of outputs from this assessment were weakened by the limited quality and quantity of data. The assessment identified biological characteristics that potentially increase the vulnerability of the species to overfishing: the species is relatively long-lived, has a slow growth rate and aggregates in restricted continental-shelf habitats.

Hunter, Dichmont & Venables (2002) showed that fishing for ruby snapper in the WDTF was historically restricted to the area of the continental-shelf region from Shark Bay to North West Cape. Commercial CPUE was highly variable – initially around 400 kg/h in January 1997, up to 900 kg/h in September 1997 and declining to less than 200 kg/h towards the end of the study period in mid-2001. Although Hunter, Dichmont & Venables (2002) could not conclusively identify the cause of the decline in catch rates, they concluded that it probably resulted from a combination of changes in stock abundance and fleet movements.

The WDTF overlaps with Western Australian state-managed demersal fisheries that also target ruby snapper. Therefore, it is highly likely that these fisheries exploit the same stock of ruby snapper. Wakefield et al. (2020) reported a combined annual average catch of ruby snapper between Western Australian fisheries and Commonwealth fisheries of 42 t (~10 t Commonwealth, ~32 t Western Australian fisheries) since 2007. The Wakefield et al. (2020) study used catch-curve and spawner per-recruit analyses relying on direct age data from 1997 and 2011 to assess the status of ruby snapper in the eastern Indian Ocean. Results indicated that in both 1997 and 2011 the stock was at approximately 60% of the unfished biomass level. Fishing mortality rates were relatively low for 1997 (0.04) and 2011 (0.05) when compared with the estimated natural mortality rate for the species (0.11 per year). This suggests that the stock was not subject to overfishing at the time.

Catch in the Western Australian state-managed bioregions that overlap with the WDTF ranged from 1.2 t to 7.4 t annually between 2011–12 and 2019–20 (generally falling below 5 t per year).

## Stock status determination

Wakefield et al. (2020) estimated that the biomass of the stock was well above the Commonwealth's limit reference point of 20% of unfished biomass in both 1997 and 2011. Combined catch (Commonwealth and Western Australia) since 2012–13 has been below 42 t. It is therefore unlikely that catch has been sufficient to drive the stock into an overfished state. As a result, ruby snapper is classified as **not overfished** and **not subject to overfishing**.

## 14.3 Economic status

### Key economic trends

Estimates of net economic returns are not available and the gross value of production of the WDTF is confidential. Owing to the remoteness of the fishery, fishing effort has been opportunistic, with a range of species caught in low volumes with high annual variability, typically generating low overall value. Total catch in each of the past 3 years has been high compared with annual catch over the previous decade, reflecting higher prices since 2017–18 for the main target species (deepwater bugs and ruby snapper) relative to earlier in the decade. Fewer than 4 vessels have operated in the fishery annually since 2009–10 and currently only 1 active vessel operates, indicating limited economic incentive to participate in the fishery.

### Performance against economic objective

There are limited indicators available to assess the economic performance of the WDTF. The low activity in the fishery and the relatively high costs of operating in remote fisheries indicates that net economic returns are likely to remain at low levels. Current management arrangements or stock status are unlikely to be constraining fishers' ability to operate profitably. Poor market fundamentals (reflecting the geographic location of the fishery) are the greatest constraints on potential increases in fishing activity. Given the fishery's relatively low value, a management approach that minimises management costs is appropriate.

## 14.4 Environmental status

The WDTF is included on the List of Exempt Native Specimens under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and is exempt from export controls until 30 November 2023. The export exemption was granted on the condition that the Australian Fisheries Management Authority (AFMA) provides a revised harvest strategy to the Department of Agriculture, Water and Environment (DAWE) by 30 June 2022 and ensures sufficient monitoring of species in the fishery protected under the EPBC Act. Any triggers and management actions identified in the harvest strategy are to be implemented by 30 June 2023.

The Western Trawl fisheries (NWSTF and WDTF) have been assessed to level 3 (now called level 2.5) of the AFMA ecological risk assessment (Zhou, Fuller & Smith 2009). No species were found to be at high risk at the current level of fishing effort.

In accordance with accreditation under the EPBC Act (see Chapter 1, 'Protected species interactions'), AFMA publishes and reports quarterly on interactions with protected species on behalf of Commonwealth fishing operators to DAWE. No interactions with species protected under the EPBC Act were reported in the WDTF in 2019–20.



These reported interactions with protected species form part of the ongoing monitoring by DAWE of the performance of fisheries within their accreditation under the EPBC Act.

## 14.5 References

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