Chapter 14
Western Deepwater Trawl Fishery

J Woodhams and A Bath

FIGURE 14.1 Area fished in the Western Deepwater Trawl Fishery, 2013–14
Chapter 14: Western Deepwater Trawl Fishery

14.1 Description of the fishery

Area fished

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).

Fishing methods and key species

Operators in the fishery use demersal trawl and catch more than 50 species in waters seaward of a line approximating the 200 m depth contour, in habitats ranging from temperate–subtropical in the south to tropical in the north. Catches in the WDTF were historically dominated by six 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, although fishing effort (and consequently catch) has decreased substantially in recent years.

Management methods

The fishery is managed under the same harvest strategy as the NWSTF (AFMA 2011; see Chapter 6).

### Table 14.1 Status of the Western Deepwater Trawl Fishery

<table>
<thead>
<tr>
<th>Status</th>
<th>2014</th>
<th>2015</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biological status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Economic status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No fishing activity occurred in the fishery during the 2015 fishing season. Estimates of NER for previous years are not available, but decline in effort and a low number of active fishing permits in recent years indicate that NER have been low.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: NER Net economic returns.

Fishing mortality

- Not subject to overfishing
- Subject to overfishing
- Uncertain

Biomass

- Not overfished
- Overfished
- Uncertain

Fishing mortality

- Not subject to overfishing
- Subject to overfishing
- Uncertain

Biomass

- Not overfished
- Overfished
- Uncertain
Fishing effort

The number of vessels active in the fishery and total hours trawled has fluctuated from year to year. Notably, total hours trawled were relatively high for a brief period during the early 2000s when fishers targeted ruby snapper (*Etelis carbunculus* and *E. marshi*) and then deepwater bugs. Total fishing effort has been comparatively low since 2005–06, although still variable, and mostly targeted at deepwater bugs. No vessels were active in the 2014–15 fishing season.

Catch

Total catch has generally remained below 100 t, apart from peaks in the early to mid 1990s, when it reached 378 t, and in 2001–02, when it reached 347 t. The peak in catch in the early to mid 1990s consisted mostly of orange roughy, while the peak in catch at the turn of the century consisted mostly of orange roughy, deepwater bugs and, to a lesser extent, ruby snapper.

Total catch has been relatively low in recent years, consisting mostly of deepwater bugs, with minimal catch of finfish. There was no catch or effort in 2014–15 (Figure 14.2; Table 14.2).

**FIGURE 14.2** Total catch in the WDTF, 1992–93 to 2014–15

![Graph showing total catch in the WDTF from 1992-93 to 2014-15](source: Australian Fisheries Management Authority)
### TABLE 14.2 Main features and statistics for the WDTF

<table>
<thead>
<tr>
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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Deepwater bugs</td>
<td>–</td>
<td>5.2</td>
<td>Confidential</td>
<td>–</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ruby snapper</td>
<td>–</td>
<td>&lt;1</td>
<td>Confidential</td>
<td>–</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total fishery</strong></td>
<td>–</td>
<td><strong>9.8</strong></td>
<td>Confidential</td>
<td>–</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Fishery-level statistics**

<table>
<thead>
<tr>
<th></th>
<th>2013–14 fishing season</th>
<th>2014–15 fishing season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effort</td>
<td>13 days; 156 trawl hours</td>
<td>0</td>
</tr>
<tr>
<td>Fishing permits</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Active vessels</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Observer coverage</td>
<td>0 days (0%)</td>
<td>0 days (0%)</td>
</tr>
<tr>
<td>Fishing methods</td>
<td>Demersal trawl</td>
<td></td>
</tr>
<tr>
<td>Primary landing ports</td>
<td>Fremantle, Carnarvon (Western Australia)</td>
<td></td>
</tr>
<tr>
<td>Management methods</td>
<td>Input controls: limited entry (11 permits), gear restrictions</td>
<td></td>
</tr>
<tr>
<td>Primary markets</td>
<td>Domestic: Perth, Sydney, Brisbane—frozen, chilled</td>
<td>International: United States, Spain, Japan—frozen</td>
</tr>
<tr>
<td>Management plan</td>
<td>North West Slope Trawl Fishery and Western Deepwater Trawl Fishery: statement of management arrangements 2012 (AFMA 2012)</td>
<td></td>
</tr>
</tbody>
</table>

*Fishery statistics are provided by fishing season, unless otherwise indicated. Fishing season is 1 July to 30 June. Real-value statistics are provided by financial year, which is also 1 July to 30 June. Notes: TAC Total allowable catch. – Not applicable.*

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**Trawl catch**

Gavin Kewan, AFMA
14.2 Biological status

Deepwater bugs (*Ibacus* spp.)

**Stock structure**

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

**Catch history**

The catch history of deepwater bugs in the WDTF is characterised by four years of relatively high catches from 2001–02 to 2004–05, peaking at 160 t in 2002–03 (Figure 14.3). Apart from this brief period, annual catches of deepwater bugs have been less than 20 t. Small quantities of deepwater bugs have been harvested in each of the past five years (between 18.7 t in 2009–10 and 3.7 t in 2011–12). There was no catch in 2014–15.

**FIGURE 14.3** Deepwater bug catch in the WDTF, 1992–93 to 2014–15

Source: Australian Fisheries Management Authority
Stock assessment
A formal stock assessment for deepwater bugs has not been done, and little information is available with which to assess stock status. The low fishing effort, low catch levels and sporadic targeting of key commercial species make it difficult to assess stock status.

Stock status determination
There was no fishing in the WDTF in 2014–15 (Figure 14.3). As a result, deepwater bugs are classified as not subject to overfishing. There is currently little empirical data that would inform status for this stock. As a result, the stock is uncertain with regard to the level of biomass.

Ruby snapper (*Etelis carbunculus* and *E. marshi*)

Stock structure
Stock structure of ruby snapper caught in the WDTF is not known, so the stock is assessed here based on the management unit.

Catch history
Catches of ruby snapper in the WDTF peaked in 2000–01, with a smaller peak in 2008–09. Catches have been negligible since 2010–11, with no effort in the fishery in 2014–15 (Figure 14.4).

**FIGURE 14.4** Ruby snapper catch in the WDTF, 1992–93 to 2014–15

Source: Australian Fisheries Management Authority
Chapter 14: Western Deepwater Trawl Fishery

Stock assessment
The only stock assessment for ruby snapper was published in 2002 (Hunter et al. 2002). However, the reliability and accuracy of outputs from this assessment were weakened by the poor quality and limited quantity of data. The assessment identified biological characteristics that potentially increase the species’ vulnerability to overfishing: the species is relatively long lived, has a high age at maturity, has a slow growth rate and aggregates in restricted continental-shelf habitats. Hunter et al. (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 catch-per-unit-effort has been highly variable—it was initially around 400 kg/hour in January 1997, peaked at 900 kg/hour in September 1997 and declined to less than 200 kg/hour towards the end of the study period in mid 2001. Although Hunter et al. (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.

Status determination for ruby snapper in the WDTF is further complicated because it is also harvested by fishers operating inshore from the WDTF—in state fisheries that are under the jurisdiction of the Western Australian Department of Fisheries. Additionally, recent multivariate analyses of otolith morphology suggest that records of historical ruby snapper catch have actually comprised two distinct species (E. carbunculus and E. marshi) that are almost indistinguishable apart from differences in otolith shape (Wakefield et al. 2014). The Western Australian Department of Fisheries is currently undertaking a stock assessment to estimate recent fishing mortality of ruby snapper in the Pilbara demersal fishery (Stephen Newman, Western Australian Department of Fisheries, 2015, pers. comm.). The results of this assessment may provide an improved basis for future assessments of the status of ruby snapper in the WDTF.

Stock status determination
A weight-of-evidence approach based on catch and landing data since the 1992–93 fishing season (Figure 14.4), together with information published with the 2002 stock assessment (summarised above), has been used to determine stock status. There was no catch of ruby snapper in the WDTF in 2014–15. As a result, ruby snapper is classified as not subject to overfishing. The absence of a reliable estimate of population size and the stock’s relatively long history of exploitation result in the stock being classified as uncertain.

14.3 Economic status

Key economic trends
Fishing is opportunistic in the fishery, and catch levels have been variable in the past. Since 2003–04, catch has not exceeded 100 t. Eleven permits were held for both the 2013–14 and 2014–15 seasons, with only three vessels active during 2013–14. The limited effort, relatively low catch and small number of active fishing permits in previous years indicate that net economic returns have been low. For 2014–15, the lack of any fishing activity indicates that fishers expect limited economic return from operating in the fishery.
Management arrangements
The fishery has the same harvest strategy as the NWSTF (Chapter 6). The WDTF is managed through input controls (11 permits with a five-year duration).

Performance against economic objective
The fishery’s performance against the economic objective is uncertain. Fishing has been opportunistic, with a range of species caught in low volumes, typically generating low overall value. Given these characteristics and no fishing activity during 2014–15, low-cost management arrangements are appropriate.

14.4 Environmental status
The WDTF was reaccredited under parts 13 and 13A of the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) until 25 November 2016. Recommendations associated with the approval included requirements for the validation of catch-and-effort data recorded by observers and in fisher logbooks, and continued cooperation with relevant jurisdictions to achieve complementary management for harvested species.

The Western Trawl fisheries (NWSTF and WDTF) have been assessed to level 3 of the Australian Fisheries Management Authority (AFMA) ecological risk assessment (Zhou et al. 2009). No species were found to be at high risk at the current level of fishing effort.

AFMA publishes quarterly summaries of logbook reports of interactions with protected species on its website. As there was no fishing effort, no interactions with protected species listed under the EPBC Act were reported in the WDTF in 2015.

14.5 References
AFMA 2012, North West Slope Trawl Fishery and Western Deepwater Trawl Fishery: statement of management arrangements, Australian Fisheries Management Authority, Canberra.

—— 2011, Harvest strategy for the Western Deepwater Trawl Fishery and North West Slope Trawl Fishery, AFMA, Canberra.

