Chapter 6

North West Slope Trawl Fishery

N Mazloumi, J Woodhams and AH Steven

FIGURE 6.1 Area fished in the North West Slope Trawl Fishery, 2017–18
### Table 6.1 Status of the North West Slope Trawl Fishery

<table>
<thead>
<tr>
<th>Status</th>
<th>2017</th>
<th>2018</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scampi (Metanephrops australiensis, M. boschmai, M. velutinus)</td>
<td>Trawl effort is relatively low compared with historical levels, and nominal catch-per-unit-effort is relatively high.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fishing mortality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biomass</td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>Fishing mortality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biomass</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic status</td>
<td></td>
<td></td>
<td>Estimates of NER are not available for the fishery. Increased catch in the 2016–17 and 2017–18 fishing seasons suggests increased gross value of production, but the effect of this on NER is uncertain because fishing costs in the 2016–17 and 2017–18 fishing seasons are likely to have increased. A high degree of latent fishing effort indicates that NER are likely to be low.</td>
</tr>
</tbody>
</table>

Note: NER Net economic returns.

- **Fishing mortality**
  - Not subject to overfishing
  - Subject to overfishing
  - Uncertain

- **Biomass**
  - Not overfished
  - Overfished
  - Uncertain

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Scampi

*Mike Gerner, AFMA*
6.1 Description of the fishery

Area fished

The North West Slope Trawl Fishery (NWSTF) operates off north-western Australia from 114°E to 125°E, roughly between the 200 m isobath and the outer boundary of the Australian Fishing Zone. A large area of the Australia–Indonesia MOU box (an area off north-western Western Australia where Indonesian fishers may operate using only traditional methods) falls within the NWSTF (Figure 6.1). There have been recent changes to the boundary of this fishery to more closely align with the 200 m isobath.

Fishing methods and key species

The NWSTF has predominantly been a scampi fishery using demersal trawl gear. The key species is Australian scampi (*Metanephrops australiensis*). Smaller quantities of velvet scampi (*M. velutinus*) and Boschma’s scampi (*M. boschmai*) are also harvested. Mixed snappers (Lutjanidae) have historically been an important component of the catch. At the height of the fishery, in the late 1980s and early 1990s, deepwater prawns, particularly red prawn (*Aristaeomorpha foliacea*), were targeted and dominated the total catch. However, difficulties in maintaining markets for deepwater prawns led to a decline in the number of vessels operating in the fishery and a return to primarily targeting scampi.

Management methods

In 2011, the Australian Fisheries Management Authority (AFMA) updated the harvest strategy for the western trawl fisheries (NWSTF and Western Deepwater Trawl Fishery—WDTF; AFMA 2011). Given the relatively low levels of catch, the purpose of the harvest strategy is to allow fishing at current levels without additional management costs. The revised strategy uses historical catches and catch rates from 2000 to 2010 as the basis for triggers for further management actions, if fishing activity increases. An annual review determines whether these catch triggers have been reached. It is not clear whether the maximum catch over the chosen reference period (2000–2010) is a valid indicator of sustainable harvest levels, given the nearly 30 years of exploitation in this fishery, or whether catch rates over the reference period are representative of unfished biomass levels. Given the recent boundary amendments to the Western Australian Offshore Constitutional Settlement arrangement, AFMA has commenced a review of the current harvest strategy, with a focus on the triggers for mixed snapper species.

The 2010 stock assessment of scampi in the NWSTF (Chambers & Larcombe 2015) may provide information for refining catch and catch-rate triggers for these species.
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**Fishing effort**

Fishing commenced in the NWSTF in 1985. The number of active vessels peaked at 21 in 1986–87 and declined through the 1990s before increasing to 10 in 2000–01 and 2001–02. Vessel numbers have since decreased to stabilise at one or two vessels each year since 2008–09 (Table 6.2). Historical effort, in trawl-hours, increased in the 2017–18 fishing season and largely follows the same trend as the number of active vessels (Figure 6.2). Fishing effort often increases when boats cease to operate in the Northern Prawn Fishery in a given season and move to the NWSTF.

**TABLE 6.2 Main features and statistics for the NWSTF**

<table>
<thead>
<tr>
<th>Stock</th>
<th>TAC (t)</th>
<th>Catch (t)</th>
<th>GVP (2016–17)</th>
<th>TAC (t)</th>
<th>Catch (t)</th>
<th>GVP (2017–18)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scampi (<em>Metanephrops australiensis</em>, <em>M. boschmai</em>, <em>M. velutinus</em>)</td>
<td>–</td>
<td>37.5</td>
<td>Confidential</td>
<td>–</td>
<td>55.2</td>
<td>Confidential</td>
</tr>
<tr>
<td>Total fishery</td>
<td>–</td>
<td>57.7</td>
<td>Confidential</td>
<td>–</td>
<td>79.7</td>
<td>Confidential</td>
</tr>
</tbody>
</table>

**Fishery-level statistics**

- Effort: 141 days; 2,868 trawl-hours
- Fishing permits: 4
- Active vessels: 2
- Observer coverage: 12 days (9%)
- Fishing methods: Demersal trawl
- Primary landing ports: Darwin (Northern Territory), Point Samson (Western Australia)
- Management methods: Input controls: limited entry, gear restrictions. Output controls: harvest strategy contains catch trigger for scampi, deepwater prawns and some finfish (redspot emperor and saddletail snapper)
- Primary markets: Domestic: Brisbane, Perth, Sydney—fresh and frozen product. International: China, Hong Kong, Japan, Singapore, Spain, United States—frozen product
- 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 – 30 June. Value statistics are by financial year.
Notes: GVP Gross value of production. TAC Total allowable catch. – Not applicable.*
6.2 Biological status

Scampi (*Metanephrops australiensis, M. boschmai and M. velutinus*)

**Stock structure**

The NWSTF targets several species of scampi. The stock structure of these species (predominantly *M. australiensis, M. boschmai* and *M. velutinus*) is not known, and they are grouped into a multispecies stock for management and assessment purposes. Scampi in the NWSTF are therefore assessed as a single stock.

**Catch history**

Trends in total catch have largely followed trends in active vessels and fishing effort (Figure 6.2). Scampi catch in recent years has increased from a relatively stable 30 t in 2012–13 to 55.2 t for the 2017–18 fishing season. Total catch has primarily consisted of scampi, except in 2011–12, when mixed snapper accounted for a large proportion of the catch (32 t of snapper and 21 t of scampi).

**FIGURE 6.2** Catch and effort for scampi in the NWSTF, 1985–86 to 2017–18

Source: AFMA
Stock assessment

In 2010, the scampi stock (predominantly *M. australiensis*, *M. boschmai* and *M. velutinus*) was assessed using surplus production models (Chambers & Larcombe 2015). This assessment indicated that scampi biomass at the end of 2008 was most likely between 65% and 85% of unfished biomass. The fishing mortality rate was estimated to have been well below the rate that would achieve maximum sustainable yield.

Wallner and Phillips (1995) noted that scampi catch rates in the NWSTF tended to decline quickly in response to fishing but recovered after grounds were rested for relatively short periods. They suggested that scampi might spend a greater proportion of time in burrows after the grounds have been trawled, temporarily reducing their catchability. If scampi respond to fishing in this way, catch-per-unit-effort (CPUE) should decline more quickly than abundance. Stock assessments based on CPUE would tend to be precautionary (that is, the stock would be less depleted than indicated by CPUE).

Nominal CPUE has been close to historical highs since the 2010 stock assessment, suggesting that biomass remains high. Trawl effort has been low over the same period (Figure 6.2), which suggests low levels of fishing mortality during this time.

The possible conservative nature of CPUE indices used in the stock assessments suggests that, provided scampi remain a primary target for the fishery, use of nominal (unstandardised) CPUE and annual catch is probably adequate for assessment purposes. Standardised CPUE series should be produced every 3–5 years, and assessment models fitted to periodically update relative biomass estimates. Analysis of the mean carapace length of Australian scampi measured by observers could provide a comparative indicator of total mortality.

Stock status determination

Chambers and Larcombe (2015) assessed the scampi stock as not overfished and not subject to overfishing in 2008–09. Since then, catch and effort have remained relatively low (Figure 6.2), and nominal catch rates are relatively high compared with historical levels. Based on these indicators and information from the previous stock assessment, scampi in the NWSTF are classified as not overfished and not subject to overfishing.

6.3 Economic status

Key economic trends

The gross value of production of the fishery has been confidential since 2006–07 because of the small number of active vessels in the fishery. Total catch has been on an upward trend; the total volume landed in the NWSTF increased by 5% in 2016–17 and by 38% in 2017–18. Scampi has a relatively high unit value compared with other species caught in the fishery and so is the main target species. In the 2016–17 fishing season, scampi made up 65% of total catch, increasing to 69% in the 2017–18 season. Total catch of scampi has increased over the past two seasons. In the 2016–17 season, the volume of scampi landed was 14% higher than in 2015–16. The volume of scampi landed in the 2017–18 fishing season increased by a further 47%.
The past three seasons have seen a significant increase in fishing effort. In 2015–16, fishing effort increased by 5%, in 2016–17 by 28% and in 2017–18 by 30%. The increase in effort, combined with 5% and 15% fuel price increases in 2016–17 and 2017–18, respectively, likely indicate an increase in total fishing costs.

With likely rising revenue and costs in the fishery in the past three seasons, the overall effect on the fishing fleet’s profitability is unclear. Moreover, economic surveys of the NWSTF have not been undertaken. However, it is likely that net economic returns of the NWSTF remain relatively low. As at March 2019, there were seven fishing permits in the NWSTF. In the 2016–17 fishing season, four permits had a nominated vessel, but only two of the four boats were active. In 2017–18, the number of nominated vessels increased to six, but only four boats were active in the fishery, indicating a decline in latent effort. High levels of latent effort can indicate low net economic returns.

**Management arrangements**

Under the harvest strategy, the fishery is managed through input controls and catch triggers. As higher catch triggers are reached, the harvest strategy may require more sophisticated stock assessment techniques to be applied (AFMA 2011). Such stock assessments would inform potential changes to management arrangements for the fishery, including a change to output controls, if catch increased sufficiently to justify such measures.

**Performance against economic objective**

The fishery’s performance against the economic objective is uncertain because there is no explicit economic target or supporting analyses. Given the likelihood that the fishery is of relatively low value, with low levels of fishing effort, a low-cost management approach such as that currently being applied is appropriate.

**6.4 Environmental status**

The NWSTF 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 18 December 2020.

Chondrichthyans and teleosts caught in the NWSTF and the WDTF have been assessed to level 3 of the AFMA ecological risk assessment framework (Zhou, Smith & Fuller 2009). None of the species assessed were found to be at high risk at the current level of fishing effort.

AFMA publishes quarterly logbook reports of interactions with protected species on its website. No interactions with species protected under the EPBC Act were reported in the NWSTF in 2018.
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6.5 References


