Stock Status Summary – 2021/22

NSW Stock Status Summary – Pink Ling *(Genypterus blacodes)*

Assessment Authors and Year

Smoothey, AF. 2021. NSW Stock Status Summary 2021/22 – Pink Ling (*Genypterus blacodes*). NSW, Department of Primary Industries, Fisheries. 16 pp.

Stock Status

Current stock status	On the basis of the evidence contained within this assessment, Pink Ling are currently assessed as **sustainable**.

Stock structure & distribution

Pink Ling (*Genypterus blacodes*) are distributed around the south of Australia from the central NSW coast to southern Western Australia, including Tasmania. Pink Ling is a deep-water species commonly associated with muddy bottoms on the continental shelf and upper slope at depths of 200–900 m. Clear and persistent differences in size and age composition (Morison et al. 2013) and differences in trends in Commonwealth commercial catch rates indicate the existence of different stocks east and west of South Cape, Tasmania (147° East) but no genetic differences have been identified between these areas (Ward et al. 2001; Patterson et al. 2021). The differences in biological characteristics and catch-rate trends have led to Pink Ling being assessed as separate stocks east and west of longitude 147°E since 2013, yet managed under a single TAC, with management arrangements in place to constrain fishing on eastern stocks to the eastern catch limit (Patterson et al. 2021). The eastern Pink Ling stock, described for the Commonwealth assessment, is associated with Commonwealth fishing zones 10, 20 and 30 (with catches from Zone 60 assigned to Zone 30; Cordue 2015). The assessment summarised here is that for eastern Pink Ling only, unless otherwise stated in the text. The assessment is detailed in Cordue (2015 and 2018) and summarised in Patterson et al. (2021).

Scope of this assessment

The fishery scientific assessment summarised in this report is considered adequate to meet the legislative requirements for supporting a total allowable catch (TAC) determination for the NSW Pink Ling that is commissioned by the Australian Fisheries Management Authority (AFMA) and published as ‘eastern Pink Ling’ in the ‘Pink Ling (*Genypterus blacodes*)’ section of the Fishery Status Reports by the Australian Bureau of Agricultural and Resource Economics and Sciences, (Paterson et al. 2021); hereinafter referred to as the Commonwealth assessment). The Commonwealth assessment references quantitative stock assessments for Pink Ling, including those for eastern Pink Ling in 2015 (Cordue 2015) and a 2018 update (Cordue 2018).

The structure of this stock status summary is consistent with a format to inform a species status determination against criteria for the Status of Australian Fish Stocks reports (SAFS; www.fish.gov.au). It does not attempt to replicate the detail of the Commonwealth assessment but cites key information from that assessment. Assessment of the status of the stock of Pink Ling that is fished by commercial and recreational fishers in New South Wales (NSW) is principally based on the modelling and assessment done for this species by the Commonwealth of Australia. The

primary mechanism for controlling the harvest of Pink Ling in the Southern and Eastern Scalefish and Shark Fishery (SESSF) is through the allocation of an Annual Total Allowable Catch (TAC). Determination of annual TACs for the Commonwealth SESSF is based on the SESSF Harvest Strategy Framework (HSF) (AFMA, 2017) that derives from the Commonwealth Fisheries Harvest Strategy Policy (HSP) (DAFF, 2007).

The Commonwealth assessment of the Pink Ling stock evaluates stock status relative to Limit and Target Reference Points prescribed in the HSF/HSP. The Tier 1 assessment uses a statistical catch-at-length and catch-at-age model. The model provides retrospective and prospective estimates of biomass (the latter for alternative TACs) and generates, through harvest control rules, a Recommended Biological Catch (RBC). The intention of this process is to move the stock biomass toward and maintain it around the Target Reference Point.

This assessment of the status of Pink Ling, in waters under NSW jurisdiction, comprises:

(1) a summary of the most recent Commonwealth stock assessment for Pink Ling (Cordue 2018) and current determinations of status based on criteria specified by the Commonwealth and also those used for the Status of Australian Fish Stocks (SAFS);

(2) the rationale by which the Commonwealth assessment for Pink Ling is considered to be relevant and valid for determining the status of the Pink Ling stock fished within NSW jurisdiction (Appendix 1);

(3) information that may inform the determination of the 2022-23 NSW TAC for Pink Ling in the Ocean Trap and Line – Line East Fishery, Line Easter (Appendix 2). This is done in the absence of: (i) a formal NSW harvest strategy for this species/fishery; and (ii) a formal resource sharing agreement between NSW and the Commonwealth.

Biology

Pink Ling are demersal species that inhabit the continental shelf and slope waters around the south of Australia. They grow to a maximum length of 1.6 m and an age of about 26 years. Males and females have been recorded to mature at about 40–46 cm and 50–58 cm total length (TL), respectively. Spawning occurs during late winter and early spring. Pink Ling are believed to be serial spawners, releasing egg batches in a floating gelatinous mass each spawning event with females producing around 333 000 eggs per spawning event, depending on the body size (AFMA, 2021).

FISHERY STATISTICS

Catch information

Commercial

Fishery statistics underpinning the Commonwealth assessment and summarised here from Patterson et al. (2021) and references therein. Within the Commonwealth, eastern and western stocks of Pink Ling are assessed separately but managed under a single TAC, with management arrangements in place to constrain fishing on eastern stocks to the eastern catch limit (Patterson et al. 2021). Descriptions of NSW fishery statistics are provided in Appendix 2 of this report and the changes in NSW commercial fishery reporting requirements and sources of NSW commercial fishery data are discussed.

Data sources in the assessment are catch histories from Commonwealth trawl and non-trawl (autoline) sectors and total NSW commercial catches (other state catches were small, within rounding error and ignored). Commonwealth discard estimates and landing multipliers were applied to data because Commonwealth trip limits were implemented during 2013 and 2014 resulting in three defined time periods in which there was no limit, a 50 kg limit or a 250 kg trip limit. Commonwealth catches were split by month within fishing method from 2013 (inclusive), allowing corrections to be applied to the three different trip limit periods. Other data were standardised trawl catch per unit effort (CPUE) (including 'period effect' for trip limit periods), length-frequency data by fishing method, zone and depth, and age-length data (Cordue 2015). The 2018 updated assessment (Cordue 2018) removed the 'period effects' from the eastern trawl CPUE analyses as their inclusion resulted in the CPUE time-series having '…an unrealistic increase in 2016 and 2017.' and instead 'discard ratios were applied to tow by tow data before the CPUE standardisation.', to account for discarding due to management measures (Cordue 2018).

The catch information underpinning the Commonwealth assessment is summarised from Paterson et al. (2021).

> Combined eastern and western catches of Pink Ling increased steadily from the start of the fishery in about 1977 to reach a peak of 2,412 t in 1997 (Figure 1a). Despite TACs continuing to increase from 1997 to 2001, catches declined steadily to about 1,800 t in 2004. From 2004/05 to 2013/14, Pink Ling catches were limited by the TAC (Figure 1b). Since 2013/14, catches have been stable at around 800 to 1,000 t. Commonwealth-landed catch in the 2020/21 fishing season was 910.3 t, based on CDRs, with 45% of the catch was from the east. Discards and state catches were not available for 2020/21. However, weighted averages of the previous four calendar years (2016 to 2019) estimated discards and state catches of 42 t and 56.2 t, respectively in the east and 10.5 t and 0.1 t, respectively, in the west (Althaus et al 2020). For the 2020/21 fishing season, total catch and discards were estimated to be 1019.1 t. Eastern Pink Ling catch in 2019/20 was 346 t and ~507.8t in the 2020/21 fishing season. Discards have been estimated to be 42 t based on the weighted average of the previous four seasons (2015/16 to 2018/19).

Figure 1a. Pink Ling annual catches (Commonwealth Trawl Sector, Scalefish Hook Sector and states combined) and discards, 1977 to 2018 (from Patterson et al. 2021).

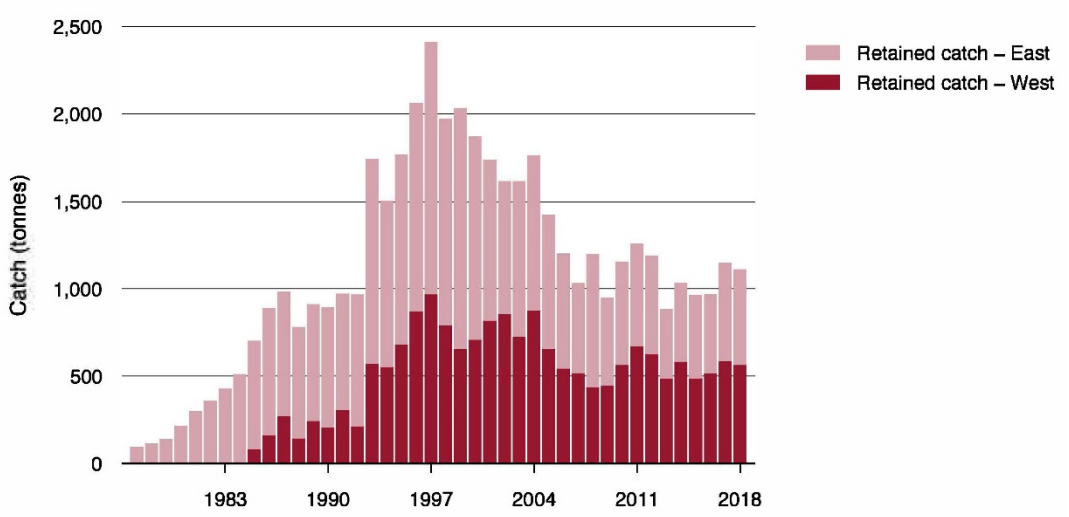
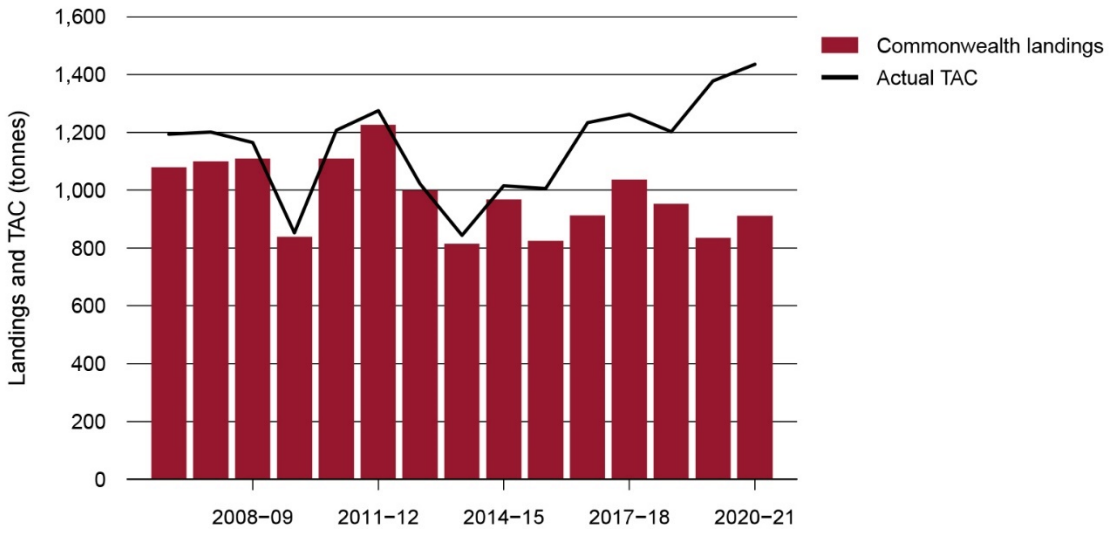


Figure 2b. Pink Ling seasonal landings (SESSF) and TACs, 2006/07-2020/21 fishing season (from Patterson et al. 2021).



Recreational & Charter boat

The Commonwealth assessment does not, at present, include estimates of Pink Ling catches by the recreational sector. The model is conditioned on commercial catch data alone. Neither does the process by which the Commonwealth TAC is calculated from the RBC account for recreational catch. Surveys of the catches in NSW by NSW-resident recreational fishers during 2013/14 and by 1-3 year licence holders in 2017/18 did not detect any catches of Pink Ling (West et al, 2015; Murphy et al., 2020). Similarly, State-wide operators within the nearshore charter fishery landed two Pink Ling during the 2017/18 survey period (Hughes et al. 2021).

Therefore, catches of Pink Ling by recreational fishers in NSW are negligible, relative to the magnitude of commercial catches. Thus, the omission of recreational catch from the model and Commonwealth assessment has little effect on the assessment outcome of the Pink Ling.

Indigenous

The Commonwealth assessment does not, at present, include estimates of Pink Ling catches by Aboriginal fishers. As for recreational catch, any catches by Aboriginal fishers in recent history are negligible, relative to the magnitude of commercial catches.

Illegal, Unregulated and Unreported

The level of Illegal Unregulated and Unreported (IUU) fishing has not been quantified.

Fishing effort information

N/A

STOCK ASSESSMENT

Despite the lack of genetic variation found between eastern and western pink ling, the differences in biological characteristics and catch-rate trends have led to Pink Ling being assessed as separate stocks east and west of longitude 147°E since 2013. Catches of Pink Ling are managed under a single TAC of 1,310 t. However, AFMA has management restrictions in place to constrain catches of the eastern stock to a notational catch-limit of 446 t for the 2020/21 fishing season.

The Commonwealth assessment classifies the Eastern Pink Ling stock as not overfished and not subject to overfishing (Patterson et al. 2021). This assessment is based on a Commonwealth Tier 1 assessment (AFMA 2017 i.e. a quantitative model-based assessment). The assessment underpinning the Commonwealth management of the Pink Ling stock is that of Cordue (2015), supplemented with an update of that 2015 assessment done in 2018 (Cordue 2018), as cited in Patterson et al. 2021.

Pink Ling (Eastern) were assessed against the SAFS criteria in 2014, 2016, 2018 and 2020 (Emery and Smoothey 2020). Status determination in 2014 was **undefined**, whilst for 2016, 2018 and 2020 the status was **sustainable**.

Stock Assessment Methodology

Year of most recent assessment:

2015 (Cordue 2015), supplemented by Cordue (2018).

Assessment method:

Commonwealth Tier 1, integrated quantitative stock assessment.

Main data inputs:

Catch – Commonwealth trawl and non-trawl (autoline) sectors; total NSW commercial catches (other state catches were small, within rounding error and ignored) (Cordue 2015)

Commonwealth discard estimates and landing multipliers were applied to data due to Commonwealth trip limits implemented during 2013 and 2014 (no limit; 50 kg; and 250 kg trip limit) (Cordue 2015)

Standardised CPUE – Commonwealth trawl sector, including 'period effect' for trip limit periods (Cordue 2015)

Updated assessment in 2018 removing 'period effect' and including discard ratio to tow by tow data prior to CPUE standardisation (Cordue 2018).

Length-frequency data by fishing method, zone and depth (various years from 1998 see Cordue 2015)

Conditional age–length data by fishing method (various years see Cordue 2015)

Age frequencies data by fishing method (various years see Cordue 2015)

Key model structure & assumptions:

Tier 1 – Integrated quantitative stock assessment (AFMA 2017; Commonwealth of Australia 2003, 2017)

Sources of uncertainty evaluated:

Model sensitivities were investigated (after Cordue 2015), including:

- Fixed mortality, *M* (low = 0.2, medium = 0.24, high = 0.28), low and high sigmaR (0.5, 0.8)
- Alternative maturity ogives (shifted up or down one year)
- A tighter coefficient of variation on the CPUE indices (10%)
- Double the effective sample sizes on the age and length frequencies, sex-specific selectivities and inclusion of the fishery independent survey indices
- 2014 trawl age frequency
- The exclusion of the period effects in the CPUE indices

Model sensitivities were investigated (after Cordue 2018) including:

- M=0.2: Reference model with M=0.2
- M=0.23 (Base): Reference model with M=0.23
- Est. M (Ref): The reference model where M is estimated using the posterior from the western assessment
- M=0.28: Reference model with M=0.28
- Unf. M: Reference model but a uniform prior on M
- Period CPUE: Using the trawl CPUE indices where period effects were estimated and M estimated
- Per. M=0.23: As for "Period CPUE" but with M=0.23
- Linkall CPUE: Using the trawl CPUE where all vessels were used as linking vessels and M estimated
- No FIS: The reference model but with no FIS indices or length frequencies

Status Indicators - Limit & Target Reference Levels

Biomass indicator or proxy	Depletion of spawning biomass (model estimated)
Biomass Limit Reference Point	B_{20} (20% of pre-exploitation spawning biomass) B_{20} ($0.2B_0$) – <B_{20}: no targeted fishing, rebuilding strategy will be developed (AFMA 2017)

Biomass Target Reference Point	B_{48} (48% of pre-exploitation spawning biomass)
Fishing mortality indicator or proxy	Fishing mortality (model estimated) Risk of overfishing i.e. low risk of SSB < B_{20} under future catch scenarios run through base case – implied from Patterson et al. 2021 (despite catches > RBCs)
Fishing mortality Limit Reference Point	Not specified within the risk profile outlined (Patterson et al. 2021)
Fishing Mortality Target Reference Point	F_{48} (Fishing mortality rate that achieves B_{48})

Stock Assessment Results

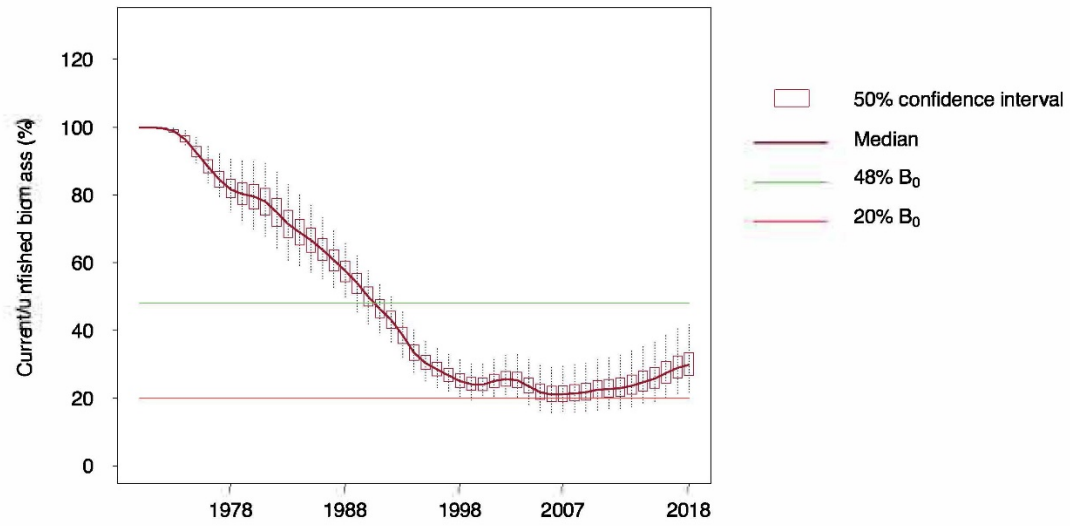
The Commonwealth assessment classifies the eastern Pink Ling stock as not overfished and not subject to overfishing (Patterson et al. 2021). This assessment is based on a Commonwealth Tier 1 assessment (AFMA 2017 i.e. a quantitative model-based assessment). The assessment underpinning the Commonwealth management of the Pink Ling stock is that of Cordue (2015), supplemented with an update of that 2015 assessment done in 2018 (Cordue 2018), as cited in Patterson et al. 2021.

Pink Ling (eastern) spawning stock biomass (SSB) estimates from Tier 1 assessment (integrated quantitative stock assessment; AFMA 2017; Commonwealth of Australia 2007, 2017) and predicted biomass as a proportion of unfished biomass (B_0) at constant-catch scenarios with performance indicators (future SSB, probability estimates of being below the limit and year of SSB being at target reference point) are presented in Figure 2.

The Commonwealth assessment summarised from Paterson et al. (2021) states:

> The 2018 assessment produced an RBC of 260 t for the eastern stock in 2019. Projections of eastern stock response to various constant-catch scenarios indicated that catches below 550 t posed a relatively low (< 5%) risk to the stock falling below the limit reference point ($0.48SB_0$), with at least 50% probability, in a reasonable time-frame (before 2050) for catches up to 500 t per year (Table 1; Cordue 2018). Subsequently, AFMA set a TAC for the eastern stock of 446 t for the 2020/21 fishing season.
>
> The Cordue (2018) assessment estimated the median biomass depletions for the eastern stock in 2018 to be 30% of the unfished spawning stock biomass ($0.30SB_0$, Figure 2). This was below the target reference point of $0.48SB_0$, but above the limit reference point of $0.20SB_0$ in the east. The eastern stock is therefore classified as **not overfished**.
>
> For the 2020/21 fishing season, total combined catch and discards were estimated to be 1,019.1 t, which is below the 2020 combined RBC of 1,320 t. The total fishing mortality for eastern Pink Ling was estimated (using the catch ratio from logbooks) to be 507.8 t, which is above the RBC of 260 t. Although total fishing mortality of eastern Pink Ling was above the RBC, the probability of the biomass being depleted to below 0.2 B_0 in 2021 at that mortality level, is below 0.05%. Furthermore, the eastern stock is expected to be rebuilt to the target reference point ($0.48SB_0$) with at least a 50% probability in a reasonable time-frame (before 2050) for catches between 500 and 550 t per year. The stock is therefore classified as **not subject to overfishing**.

Figure 2. Estimated spawning stock biomass for eastern Pink Ling, 1970 to 2018 (Cordue 2018, cited in Patterson et al. 2021).



Note: B_0 unfished biomass.

Table 1 Base-case 2018 stock assessment performance indicators for eastern Pink Ling, showing stochastic projections at a range of future constant catches (Cordue 2018, cited in Patterson et al. 2021).

Annual catch (t)	B_{2021}/B_0	B_{2026}/B_0	Probability $B_{2021}<0.2B_0$	Probability $B_{2026}<0.2B_0$	Rebuild year
0	0.42	0.72	0	0	2023
300	0.37	0.53	0.01	0	2026
400	0.35	0.47	0.02	0.01	2030
450	0.34	0.44	0.02	0.01	2033
500	0.33	0.41	0.04	0.02	>2040
550	0.32	0.38	0.05	0.05	>2050
600	0.32	0.35	0.06	0.11	>2050
650	0.31	0.31	0.08	0.18	>2050

Notes: B_0 Unfished biomass. B_{year}/B_0 Predicted biomass ratio in given year. $B_{year} < 0.2B_0$ Biomass below 20% B_0 in given year. Rebuild year is the projected year for rebuilding to 48%B_0.
Source: Cordue 2018

Stock Assessment Result Summary

Biomass status in relation to Limit	Performance measure above Limit – Spawning stock biomass estimated at $0.30SB_0$ in the 2018 assessment (Cordue 2015, 2018 and Patterson et al. 2021)
Biomass status in relation to Target	Performance measure below Target Reference Point of B_{48} ($0.48B_0$)
Fishing mortality in relation to Limit	N/A
Fishing mortality in relation to Target	N/A
Current SAFS stock status	**Sustainable**
Current Commonwealth stock status	**Not overfished** **Not subject to overfishing**

Fishery interactions

There are interactions between the Commonwealth Trawl and Auto Lining Fisheries and other commercially fished, by-catch and other species, including threatened and endangered species. Various management and mitigation measures are in place to address many of these issues (AFMA 2018)

The Commonwealth Trawl Fishery interacts with other commercial and non-commercial bycatch and discard marine species, a range of endangered threatened and/or protected species and marine habitats (AFMA 2014; Wayte et al. 2007).

Qualifying Comments

Supplementary information relevant for to the interpretation of the assessment is provided in Appendix 1 and 2.

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Appendix 1

Reliability and Relevance of the Commonwealth Assessment to assessment of stock status in NSW

The current Commonwealth assessment of Pink Ling could adequately inform the decision process for an NSW TAC determination, given that the stock of eastern Pink Ling fished in Commonwealth and State jurisdictions is considered a single biological stock, it is reasonable that NSW use the Commonwealth assessment as the basis for determining stock status in NSW. Further, the commercial landings data used in the model include landings data from NSW.

The benefits of adopting Commonwealth assessments include the application of processes exposed to broad review, including by management, science and industry representatives within the Commonwealth fishing sector, as well as observers from other stakeholder groups (e.g. NSW DPI Fisheries). The Commonwealth assessments have not, however, been developed to provide specific outputs for jurisdictions other than the Commonwealth and do not necessarily include or apply data at resolutions more applicable to alternate jurisdictions. Therefore, applying these assessments to inform NSW total allowable catch (TAC) determinations is done understanding that there are limitations in the data used and the application of the data to a scale other than that to which the assessment was applied.

In addition, applying the assessment of Pink Ling from the Commonwealth to inform the status of NSW Pink Ling and reliably inform management decisions for this species assumes (among other issues) that the assessment represents the same population(s) being harvested by these fisheries. Support for this assumption is provided by the 2020 determination of the stock structure of Pink Ling for the 2020 SAFS reports as a biological stock at the scale of eastern Australia, including Commonwealth waters to which the Commonwealth assessment applies and NSW waters.

NSW and Commonwealth SESSF catch rates

Trends in standardised catch rates (CPUE) for eastern Pink Ling taken by setline in the Ocean Trap and Line, Line East fishery operating within NSW jurisdiction (Figure 7) are generally consistent with indices of abundance based on spawning stock biomass trends in Commonwealth Trawl Sector and Scalefish Hook Sector (Figure 2). Both sources of data, show increasing trends in abundance between 2010 and 2018. This suggests that the component of the stock in NSW waters is exhibiting similar dynamics (with respect to abundance) to the component of stock under Commonwealth jurisdiction and this is consistent with the assumption of a single biological stock.

Appendix 2

NSW catch statistics and additional information relevant to TAC setting in NSW

The commercial fishery data presented in this section of the report includes total Pink Ling catch landed in NSW from 1976/77 to present and catches reported from the NSW Ocean Trap and Line - Line East (OTLLE) from 2009/10. Information presented in figures and table below is summarised by financial year (July–June). These data are provided as supplementary information to the assessment and to help inform the NSW total allowable catch determination. NSW commercial fishery records have not been consistently reported throughout the history of the fishery. Catch from 1976/77 to 1996/97 (inclusive) includes catch from outside current NSW waters (i.e. Commonwealth catches). Total catch from 1997/98 is restricted to waters in NSW jurisdiction. From 1993 landing Pink Ling was prohibited in the NSW Ocean Trawl Fishery.

State-wide fisheries catch

Annual total catch of Pink Ling demonstrated a substantial increase from the mid-1970s, catches showed a peak in excess of 500 t in 1984/85 and ~450 t in 1993/94, with a trough in 1988/89 of ~230 t (Figure 1a and b). For three years from 1997/98, reported catches of Pink Ling in NSW were greater than 40 $t.yr^{-1}$. Over the proceeding 9 years, from 2000/01 to 2008/09, annual catches were <25 $t.yr^{-1}$ (range 9.2 t – 24.6 t) and averaged ~16 $t.yr^{-1}$. Between 2008/09 and 2009/10, the total annual catch increased ~25 t to 48.2 t and since 2009/10 annual catches have remained above 40 $t.yr^{-1}$. Since 2009/10, the highest catch of Pink Ling was 68.8 t, landed in 2016/17. Total catch in 2012/21 was 50.9 t (Figure 3). Annual landings of Pink Ling in NSW, on average, are less than 13% of the total annual catches landed in the Commonwealth (SESSF Commonwealth Trawl Sector, SESSF Gillnet, Hook and Trap Sector and South East Non-Trawl Fishery, Figure 4).

Pink Ling are landed almost exclusively in the OTLLE endorsement (2009/10-2020/21 ≥ 97.2%, range 40.3-68.5 $t.yr^{-1}$; Figure 5), and within the OTLLE, almost exclusively by the setline demersal fishing method (2009/10-2020/21 > 91%; range 30.8-66 $t.yr^{-1}$; Figure 6).

Additional information relevant to TAC setting in NSW

1. The Pink Ling TAC for the May 2020-April 2021 fishing season was set at the 8-year maximum catch of 67.7 tonnes.

2. The Independent Allocation Panel (IAP) recommended that the initial allocation of quota shares for Pink Ling be calculated based on 20% on the proportion of access shares held + 80% on recorded landings for an individual fishing business in the Ocean Trap & Line – Line East Share Class over the selected criteria period 2009/2010 to 2016/2017 (inclusive), but with the "worst catch year" for each business removed (https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0009/832464/Ocean-Trap-and-Line-IAP-Final-Report.pdf).

3. Statistics describing landings of Pink Ling from NSW commercial fisheries may inform determination of a NSW TAC that is consistent with the development of an inter-jurisdictional resource sharing policy.

4. Landings of 59.6 t were reported against a TAC of 67.7 t in 2020/21.

5. In 2020/21 fishing period approximately 21.71 t of quota was held by fishing business that reported nil landings of Pink Ling. However, if you consider fishers that did not use their allocated quota, yet transferred it to other fishers, the result is 6.26 t.

6. 31.3t (46.2%) of the 2021-22 Pink ling TAC (67.7 t) was taken at 1St November 2021 (51% of season complete).

7. SESSF notational catch-limit recommendation for the eastern stock of Pink Ling for 2021/22 was 427 t, which was a 19 t reduction on the 2020/21 notational catch-limit (446 t). Moreover, SESSF TAC recommendation for 2021/22 was 1121 t, which was a 189 t reduction on the 2020/21 TAC (1310 t, https://www.afma.gov.au/sites/default/files/sessf_tac_recommendations_2021-22_-_for_concession_holders.pdf).

Figure 3. Annual catch (t) of Pink Ling from all fishing methods reported to NSW from 1997/98 to 2010/21.

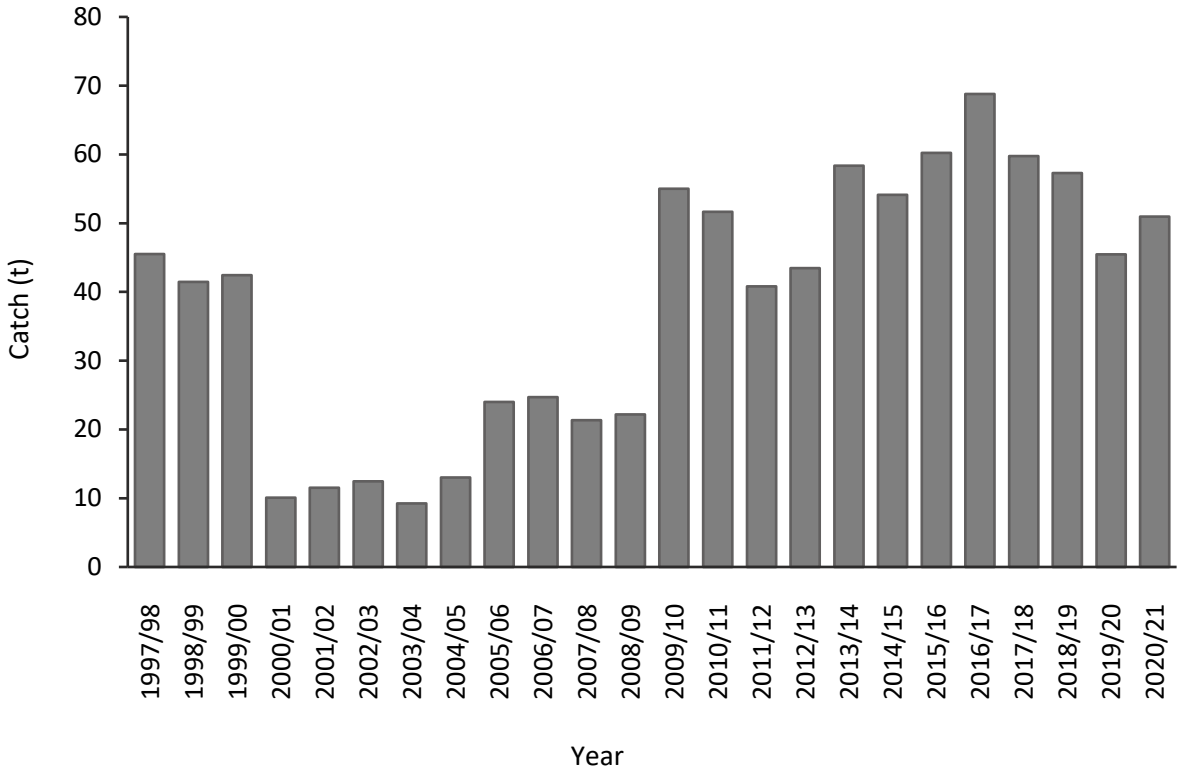

Figure 4. Annual catch (t) of the eastern stock of Pink Ling from the Commonwealth (dark grey, SESSF Commonwealth Trawl Sector, SESSF Gillnet, Hook and Trap Sector & South East Non-Trawl Fishery) and all fishing methods reported to NSW (white) from 2010/11 to 2019/20. Data sourced from SAFS.

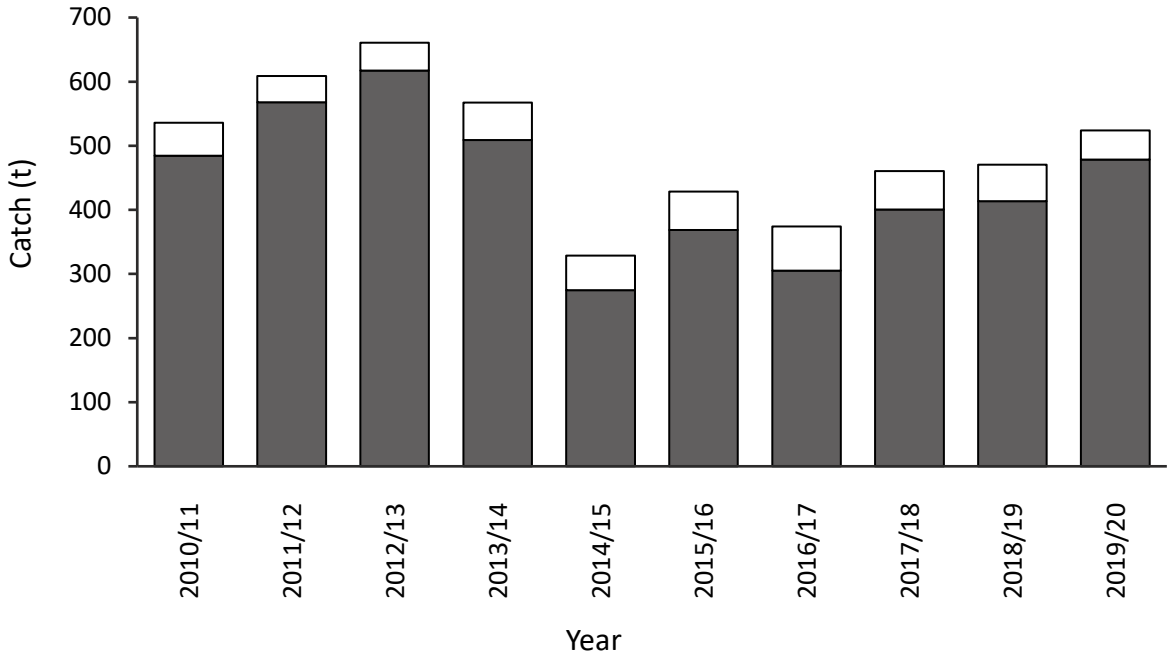

Figure 5. Annual catch (t) of Pink Ling in NSW Ocean Trap and Line - Line East (grey) and all other endorsement codes (black) from 2009/10 to 2020/21.

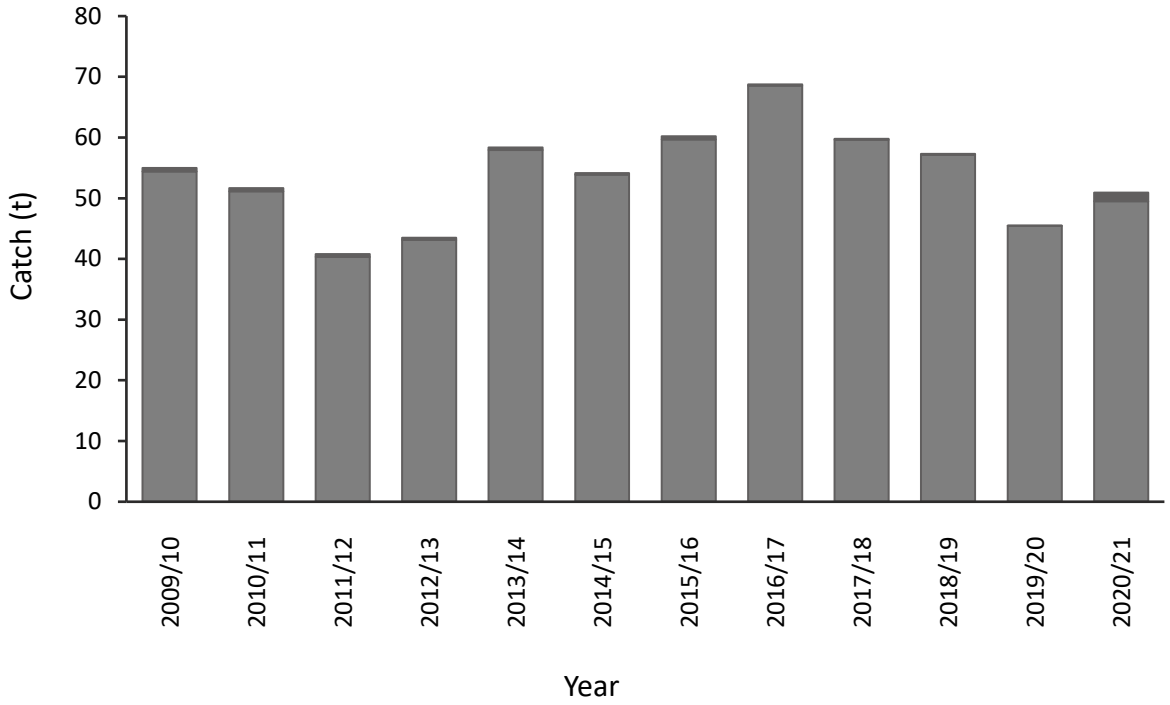

Figure 6. OTLLE – fishing methods - Annual catch (t) of Pink Ling in NSW Ocean Trap and Line - Line East (OTLLE) by setline (grey columns; demersal (STD), trotline (TTL) and unspecified setline (ST)), dropline (white columns; DPL), and other methods (black columns) from 2009/10 to 2020/21.

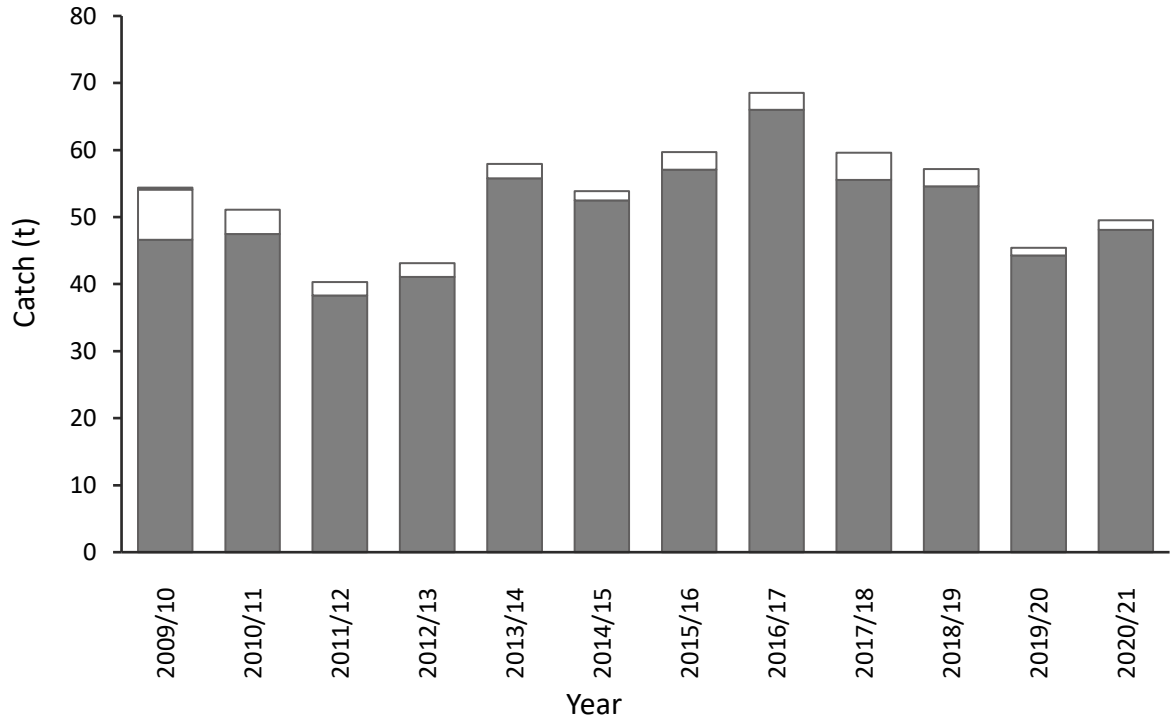

Figure 7. Annual standardised CPUE (kg.day^{-1}) using setline in the OTLLE from 2009/10 to 2020/21. The horizontal line represents the average catch rate (2009/10 to 2020/21). Vertical line = TAC introduction.