

NSW Stock Status Summary – 2023/24

Stout Whiting (*Sillago robusta*)

Karina Hall (2024)

This stock status summary report, summarises information from the combined Trawl Whiting stock assessment report:

Hall, K. C. 2024. Stock assessment report 2023/24 – Eastern School Whiting (*Sillago flindersi*) and Stout Whiting (*Sillago robusta*). NSW Department of Primary Industries, Fisheries Research: 89 pp.

Stock Status

Current stock status	On the basis of the evidence contained within this assessment, Stout Whiting is currently assessed as a sustainable stock for the NSW part of the stock.
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Stock structure & distribution

Stout Whiting (*Sillago robusta*, CAAB 37 330005) is a tropical species that occurs on both the west and east coasts of Australia in ocean waters to a depth of 70 m. There is strong genetic evidence to suggest that the west and east coast populations of Stout Whiting are separate sub-species or species (Dixon *et al.*, 1987). More recent molecular analyses of Stout Whiting samples from Queensland locations also suggest that biological sub-stocks of the east coast stock are unlikely to exist (Ovenden and Butcher, 1999). Therefore, Stout Whiting in southern Queensland and northern NSW are considered a single eastern Australia biological stock for assessment purposes (Roelofs and Hall, 2021).

Scope of this assessment

This assessment of the stock status of Stout Whiting was completed according to the Status of Australian Fish Stocks (SAFS) criteria (Pidcocke *et al.*, 2021), using data up to and including 2022 (and 2023 in some analyses) in calendar years. Where necessary data for Stout Whiting were adjusted or combined with data for Eastern School Whiting (*Sillago flindersi*), to support determination of a combined trawl whiting total allowable commercial catch (TACC) in New South Wales (NSW) for the 2024-25 fishing season (1 May to 30 April). The assessment refers to the NSW Trawl Whiting Harvest Strategy (NSW DPI, 2022). For the 2023-24 fishing season, the combined NSW TACC for trawl whiting was set at 1,066 t.

The Stout Whiting stock is shared with the Queensland Finfish (Stout Whiting) Trawl Fishery, which has also been subject to a voluntary catch quota since 1998 and is managed by the Queensland Department of Agriculture and Fisheries (DAF) under the recently endorsed Commercial Trawl Fishery (Fin Fish) Stout Whiting Harvest Strategy: 2021–2026 (DAF, 2021). For the 2023 fishing season (based on calendar years), the Queensland TACC for Stout Whiting was set at 1,393 t.

A quantitative stock assessment of the entire biological stock of Stout Whiting is completed by Queensland agencies every 3-5 years, with a significant input of NSW data, including standardised CPUE series and discard rate estimates (Wortmann and Hall, 2021). The most recent update of the quantitative assessment was completed in 2021 using data up to 2020. The current year was considered an ‘interim assessment year’,

therefore, this stock assessment report summarises existing information on primary indicators and updates fisheries statistics and data for a range of secondary indicators according to the NSW harvest strategy.

The assessment results for Stout Whiting are presented here at the biological stock level –eastern Australia; however, the conclusions and stock status are derived independently by NSW DPI to support catch quota setting and management for the NSW part of the stock and do not reflect a cross-jurisdictional consensus (as for the national SAFS assessments). The most recent update of the national SAFS assessment occurred in 2023, with Stout Whiting assessed as a **sustainable stock** (Jesson Kerr and Hall, in press).

Biology

Stout Whiting reach a maximum age of 8 years off southern Queensland, 10 years in northern NSW (near Yamba) and 6 years in central NSW (near Newcastle), with a maximum reported size of 23.7 cm FL (O'Neill *et al.*, 2002; Butcher and Hagedoorn, 2003; Gray *et al.*, 2017). However, most of the commercial catch comprises 2- and 3-year-old fish (12 to 18 cm FL) in northern NSW and 1- and 2-year-old fish in central NSW (10 to 13 cm FL) and southern Queensland (of slightly larger size, 14 to 17 cm FL) (O'Neill *et al.*, 2002; Gray *et al.*, 2017). Sexual maturity is reached at about 2 years of age and 15 cm FL.

Fishery statistics

Catch information

Commercial

Annual commercial catches of Stout Whiting in NSW state waters (following adjustment for inaccurate species reporting in northern NSW) show a rapid increase from <100 t per annum to a peak of 526.7 t in 1998. Following a second peak of 479.1 t in 2002, annual catches have remained below 300 t. A catch of 190 t was reported in 2022 and 172 t has already been reported in 2023. Recent catches account for approximately 25% of the total trawl whiting harvest from NSW waters (Fig. 1). In NSW, historic discard rates of Stout Whiting were much higher than recent estimates.

Commercial catches of Stout Whiting in NSW are almost exclusively taken by the ocean prawn trawl sector along the northern coast, with minor quantities reported by the northern fish trawl from the central coast in more recent years (Figs 2 and 3). Although data adjustments for inaccurate species reporting are only applied to prawn trawl catches in northern zones, some misreporting of Stout Whiting as Eastern School Whiting could be occurring further south to produce smaller catches in the fish trawl sector. The sudden increase in fish trawl catches of Stout Whiting in 2020 (Fig. 3) may have resulted from greater industry awareness of the need to report correctly and may indicate that fish trawl catches of Stout Whiting were historically greater than reported.

On average, the bulk (80%) of the total landed catch of Stout Whiting is taken in Queensland and only 20% is taken in NSW (Roy and Hall, 2016) (Fig. 4). In southern Queensland, Stout Whiting is targeted by a small number (2 to 6) Danish seine and otter trawl vessels in the Finfish (Stout Whiting) Trawl fishery, between Fraser Island and the NSW border, but it is also caught and discarded as by-catch by the much larger East Coast Otter Trawl Fishery. The latter fishery primarily targets Eastern King Prawn (*Melicertus plebejus*) and is not permitted to retain Stout Whiting, but estimated discard mortalities are included in estimates of total removals for stock assessments (Wortmann and Hall, 2021). Queensland reported logbook catches, however, only include those taken by the targeted whiting sector.

Queensland commercial catches (not including estimated discards) were over 1,000 t for the preceding five years (2017–2021), but decreased to 947 t in 2022 (Sumpter, 2022) (Fig. 4). The Queensland TACCs were set at 1,106 t between 2017 and 2020, with the quota fully or almost fully caught (Wortmann, 2020), and then were recently

increased to 1,281 t and 1,393 t in 2021 and 2022, respectively, in response to rising Queensland catch rates (Sumpter, 2022).

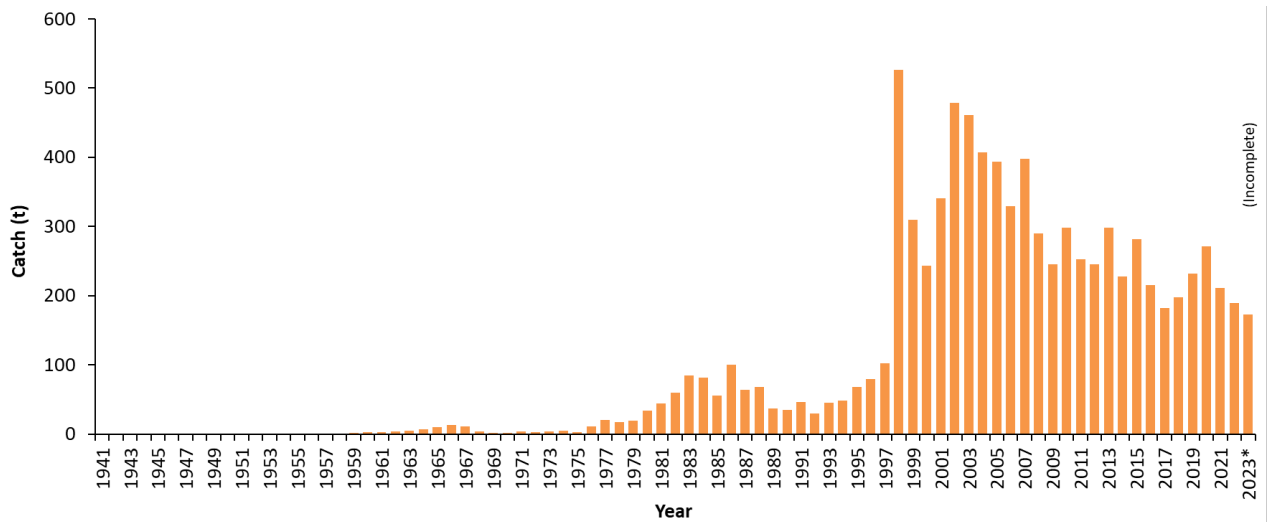


Figure 1 Annual adjusted commercial catches (tonnes) of Stout Whiting in NSW state waters (1941–2023). Catches have been adjusted for inaccurate species reporting in northern NSW and only oceanic ‘mixed whiting’ catches have been included. *Data for 2023 are incomplete.

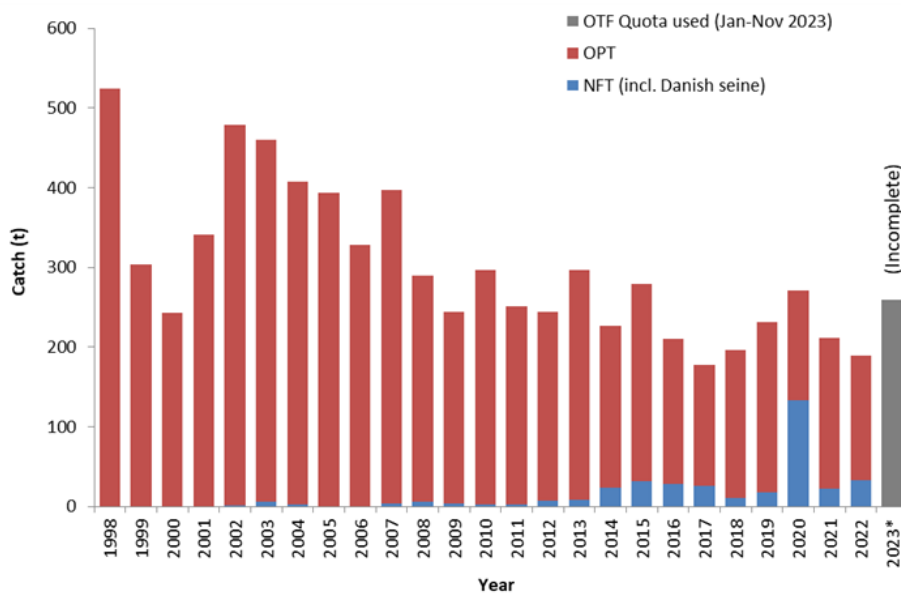


Figure 2 Annual adjusted commercial catches (tonnes) of Stout Whiting in NSW waters (1998–2023) for different sectors and endorsements in the NSW Ocean Trawl Fishery (OPT=ocean prawn trawl, NFT=northern fish trawl). *Data for 2023 are incomplete and the estimated quota used north of Barrenjoey Point for January to November 2023 is indicated instead (grey bar).

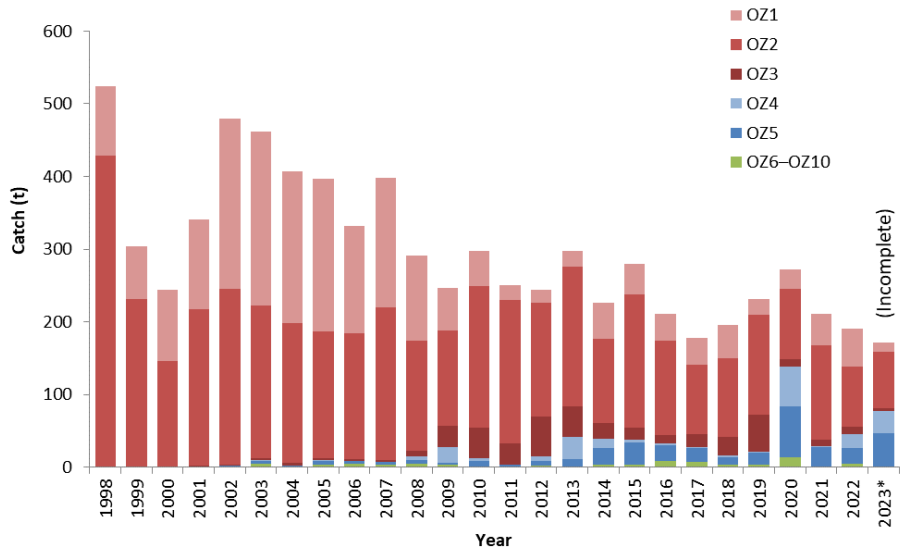


Figure 3 Annual adjusted commercial catches (tonnes) of Stout Whiting from the NSW Ocean Trawl Fishery (1998–2023) reported in different fishing zones (OZ1–OZ10) covering one degree of latitude each from north to south. Catches in OZ6 and further south (negligible amounts) were aggregated for confidentiality reasons. *Data for 2023 are incomplete.

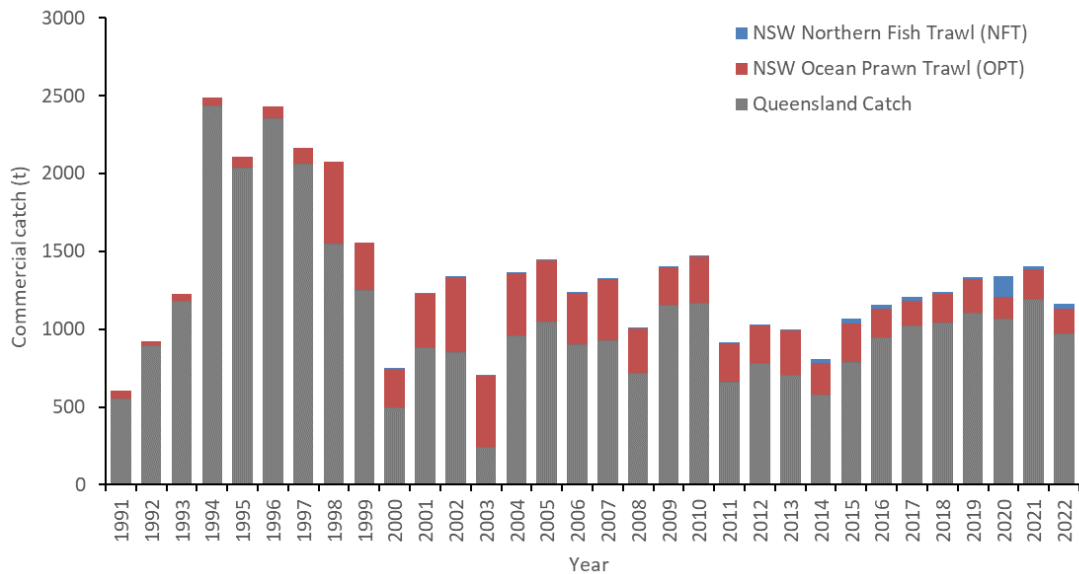


Figure 4 Annual landed commercial catches (tonnes) of Stout Whiting from New South Wales (NSW) and Queensland waters from (1945–2022). Queensland data from DAF (unpub. data).

Recreational & Charter boat

Estimates of recreational catches of combined trawl whiting (Eastern School Whiting and Stout Whiting) from NSW waters are based on biennial telephone surveys of Recreational Fishing Licence (RFL) Households, comprised of at least one fisher possessing a long-term (1 or 3 years duration) fishing licence and any other fishers resident within their household, excluding other long-term licence holders. In all recent surveys, reports of trawl whiting catches have been rare (~0.1% of surveyed households reported trawl whiting catches in the most recent survey) and consequently estimates have a high standard error (SE) and questionable reliability. The most recent estimate

of the recreational harvest of combined trawl whiting in NSW was approximately 259 (\pm 257 SE) fish or around 0.04 t during 2021/22 (Murphy et al., unpub. data), which was considerably smaller than in previous surveys: 9,882 (\pm 4,040) fish in 2019/20, 10,933 (\pm 8,016) fish in 1917/18 and 4,995 (\pm 2,078) fish in 2013/14 (West et al., 2015; Murphy et al., 2020, 2022). Irrespective of the data quality, recreational catches are clearly negligible relative to commercial catches, comprising approximately 0.1% of the total harvest of trawl whiting from NSW waters.

Eastern School Whiting and Stout Whiting are also rarely reported in logbook catches of the NSW Charter Boat Fishery and these catches are similarly considered insignificant in comparison with commercial catches (Gray and Kennelly, 2016; Hughes *et al.*, 2021).

Indigenous

The annual Aboriginal harvest of Eastern School Whiting in NSW waters is currently unknown, but is also assumed to be small and to have a negligible impact on the stock biomass.

Illegal, Unregulated and Unreported

The level of illegal, unregulated and unreported fishing is unknown; however, there is considerable inaccurate reporting to individual trawl whiting species on catch returns, particularly in northern NSW waters. Data in OZ1 and OZ2 have been adjusted accordingly, which affects total catch amounts for each species. In addition, large quantities of trawl whiting catches in 2016–2018 were reported without accurate location information and other large catches in 2019 and 2020 on the south coast in OZ8 were deemed invalid and have been partially removed from total catches.

Fishing effort information

Commercial fishing effort for Stout Whiting was collected as number of days fished on monthly records prior to July 2009 and as number of hours fished per daily event after July 2009. To form a longer time series of effort, recent daily events were re-aggregated, with effort in fisher days estimated from the number of fishing events entered for each fisher in each month where Stout Whiting was reported on at least one day.

Reported effort for Stout Whiting in the prawn trawl sector also declined rapidly from 8,644 fisher days in 1998 to 3,951 fisher days in 2009 (Fig. 5). Since then, effort declined more gradually, but following quota introduction in 2019 rapidly decreased to 1,925 fisher days and 10,470 fisher hours in 2022 and appears to have declined further in 2023 to 7,605 fisher hours (although data are still incomplete).

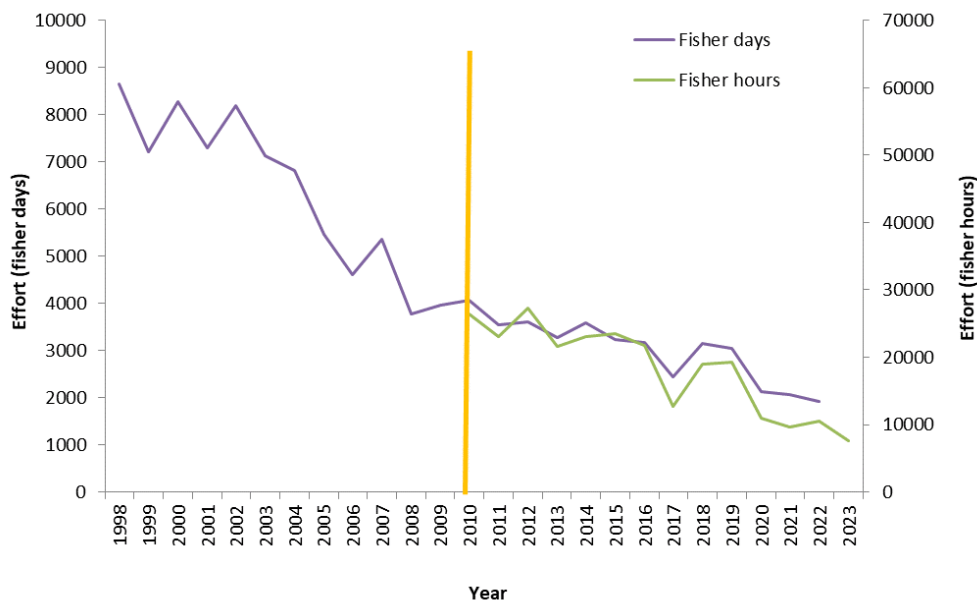


Figure 5 Annual adjusted effort (fisher days and fisher hours) for all prawn trawl fishers that reported landing Stout Whiting on at least one day in any given month. *Data for 2023 are incomplete.

Catch-rate information

Standardised catch rates (catch-per-unit-effort, CPUE) for Stout Whiting taken by ocean prawn trawl sector were compiled from monthly records (in kg per day) between 1998 and 2008 and daily event records (in kg per hour) between 2010 to 2023.

The mean standardized catch rates of Stout Whiting in the prawn trawl sector rapidly declined between 1998 and 2000 to more than 50% below the long-term average, then steadily increased and have remained above or near long-term averages since 2006 (Fig. 6). This suggests that the Stout Whiting stock in northern NSW may have declined following the peak trawl whiting catches in the late 1990s, but has since recovered.

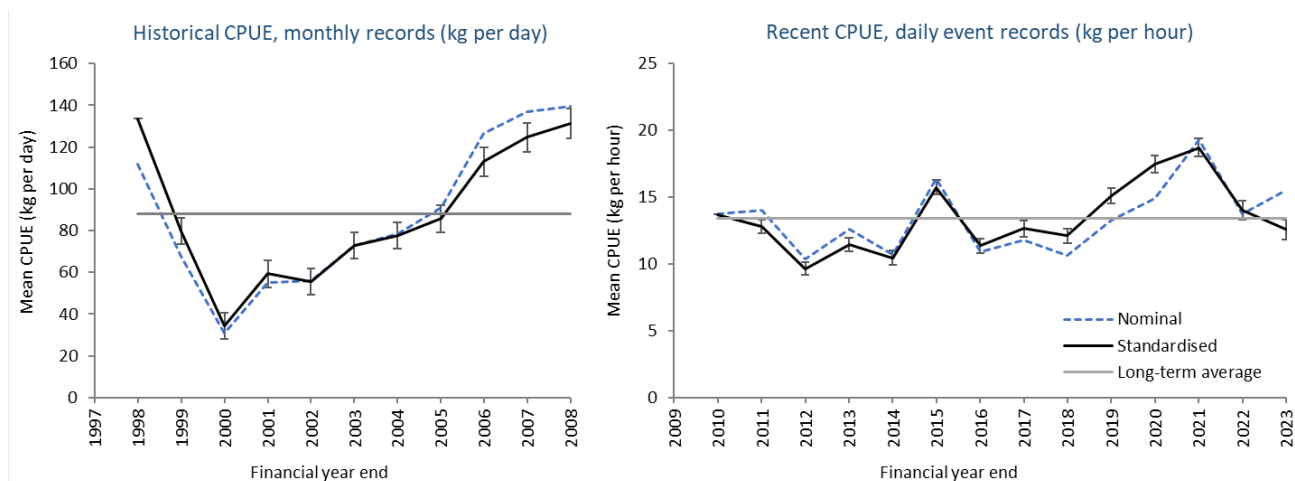


Figure 6 Mean standardised catch rates (catch-per-unit-effort, CPUE) of Stout Whiting for the ocean prawn trawl sector of the NSW Ocean Trawl Fishery, estimated from monthly records (1998–2009) in kg per day and from daily event records (2010–2023) in kg per hour. Data for 2023 are incomplete. The dashed and solid lines indicate the nominal and standardised mean CPUE (\pm 95% confidence intervals), respectively; and the grey horizontal line indicates the long-term average for each series.

Stock Assessment

Stock Assessment Methodology

The NSW Trawl Whiting Harvest Strategy (NSW DPI, 2022) outlines primary indicators of spawning stock biomass depletion relative to unfished spawning stock biomass for each species, and also includes a range of secondary indicators that are to provide supplementary information to apply decision rules in interim years. The most recent quantitative stock assessment for Eastern School Whiting was completed in 2020, so this year is considered an interim year for stock assessment purposes. Therefore, the following stock assessment summarises available information on the primary spawning stock biomass indicators and assesses updated information for the above secondary indicators.

Year of most recent assessment:

2021 using data up to 2019/20, for the Queensland quantitative stock assessment completed by DAF (Wortmann and Hall, 2021); and 2023 using data up to 2022, for the NSW assessment of primary and secondary indicators as outlined in the NSW harvest strategy for an interim year (Hall, 2024).

Assessment method:

In 2021, a two-fleet integrated age-structured population dynamics model was fitted using Stock Synthesis SS-V3.30.15 (Methot and Wetzel, 2013; Methot *et al.*, 2019); and in 2023, weighted-average percent changes in catch rates of the prawn and fish trawl sectors of the NSW Ocean Trawl Fishery, standardised using the r-package 'rforcpue' (Haddon, 2023).

Main data inputs:

Commercial landings – reported annual catch, taken from fisher logbooks for the Queensland Finfish trawl sector (1990–2022) and NSW OTF (1998–2022).

Estimated discards and rates – reported discard weights for the Queensland Finfish trawl sector (1990–2016) and estimated by-catch for the Queensland East Coast otter trawl sector from reported boat-days of effort (1991–2013). Estimated discard rates from NSW onboard observer programs (1992–1995 and 2014–2019).

Commercial catch rates – reported annual catch-and-effort data for two fleets – Queensland Finfish mixed Danish seine and otter trawl fleet in catch-per-hour and catch-per-shot from daily records (1990–2016); NSW OTF prawn and fish trawl fleet (combined Danish seine and otter trawl methods in Queensland analyses, Danish seine excluded in NSW analyses) in catch-per-day from monthly records (1998–2008) and daily event records (2010–2023).

Length compositions – random samples of two 5 kg boxes from every fishing trip by vessels in the Queensland Finfish trawl fleet (1991–2016); length frequencies are statistically re-weighted by region.

Proportions-at-age data – from sectioned otoliths collected from fish sampled for length compositions from the Queensland Finfish trawl fleet (1991–2016).

Key model structure & assumptions:

• Population dynamics modelling

Assumptions: a single-sex model (length data are not available by sex), with an equal sex ratio throughout the lifespan; growth according to the von Bertalanffy growth curve and average annual recruitment follows a Beverton–Holt stock–recruitment relationship; age and length data for the NSW fleet were the same as the Queensland fleet; the population was at an unfished biomass and equilibrium age-structure at the start of 1945; population abundance is proportional to standardised catch rates; the selectivity of fleets, rate of natural mortality and growth (mean size-at-age) are constant over time; and selectivity is logistic for all fleets. More detail on model assumptions are provided in Wortmann and Hall (2021) and Methot and Wetzel (2013).

• Standardised catch rates

Assumptions: annual catch rates are a relative index of abundance and not unduly influenced by other factors that are not accounted for through standardisation.

Sources of uncertainty evaluated:

The 2021 Queensland stock assessment included six additional model runs to assess model sensitivity to the fixed input parameters, including the effects of varying the natural mortality (from $M=0.6$ to 0.55, 0.7 or 0.85 per year) and reducing or increasing the trawl bycatch estimate (Wortmann and Hall, 2021).

Status Indicators - Limit & Target Reference Levels

The stock status of Stout Whiting was assessed against the following performance indicators and reference points outlined in the NSW Trawl Whiting Harvest Strategy (NSW DPI, 2022).

Biomass indicator or proxy	Spawning stock biomass depletion (as a percentage of the estimated unfished spawning stock biomass) estimated every 3–5 years from population biomass modelling; and standardised CPUE-based reference points in interim years.
Biomass Limit Reference Point	Blim of 20% of unfished spawning stock biomass. Current catch rates are assessed relative to long-term averages and levels in the last full assessment year.
Biomass Target Reference Point	Btarg of 48% of unfished spawning stock biomass.
Fishing mortality indicator or proxy	Current harvest levels relative to the estimated recommended biological catch (RBC) from population biomass modelling; and fishing mortality estimates from catch-curve analyses and total catches and discards relative to estimated RBCs in interim years.
Fishing mortality Limit Reference Point	Level of fishing mortality (F _{lim}) above which overfishing is occurring and biomass is depleting toward Blim.
Fishing Mortality Target Reference Point	Level of fishing mortality (F _{targ}) that would result in a spawning stock biomass of B _{targ} .

Stock Assessment Results

Primary indicators

- **Spawning stock biomass**

Results from the most recent full stock assessment for Stout Whiting in 2021 suggested that the estimated spawning stock biomass had recovered to 42% of unfished biomass in 2020 following a minimum of 20–30% in early 2000s (Wortmann and Hall, 2021). Results also suggested that the biomass was at the level for the maximum sustainable yield for the entire biological stock (all sectors and discarded bycatch components including that from the Queensland East Coast prawn trawl fishery). Under the harvest rules outlined in the draft Queensland harvest strategy for Stout Whiting, an RBC of 2,018 t in 2021 was predicted to permit the spawning stock biomass to rebuild to a relative biomass depletion of 48% of unfished biomass within 3 years and 60% by 2032 with a 0.87 buffer. The stock assessment referred to the draft Queensland harvest strategy, which originally outlined a target biomass reference point of 60%, but this has since been revised to 48% in the finalised harvest strategy, in line with the draft NSW harvest strategy (DAF, 2021).

Secondary indicators

- **Fishing mortality**

The Queensland harvest strategy does not outline any specific reference points with respect to fishing mortality (DAF, 2021). So, although surplus production fishing mortality estimates were estimated during the most recent full stock assessment update these were not interpreted within the assessment report. Nevertheless, results from the stock assessment indicated that current levels of harvest are below that needed to maintain the biomass at the level for maximum sustainable yield (MSY).

- **Annual total catches and discards in NSW and other jurisdictions**

Total catches of Stout Whiting across all jurisdictions decreased slightly between 2019 and 2022, with a 3.9% decrease in NSW and 9.3% decrease in Queensland, producing an overall weighted average percent decrease of 13.2% (Hall, 2024). In contrast, anecdotal information from industry in NSW suggest that discards may have increased following the introduction of quota in 2019. Updated discard estimates for Queensland catches were not available for the current assessment.

- **Proportion of total catch caught by each jurisdiction for each species**

The proportion of the total Stout Whiting catch taken by NSW fisheries (16%) versus that taken by Queensland (84%) in 2022, was similar to that in the full assessment year (2019) and only marginally differed from the 10-year average (of 21 and 79%, respectively) (Fig. 7).

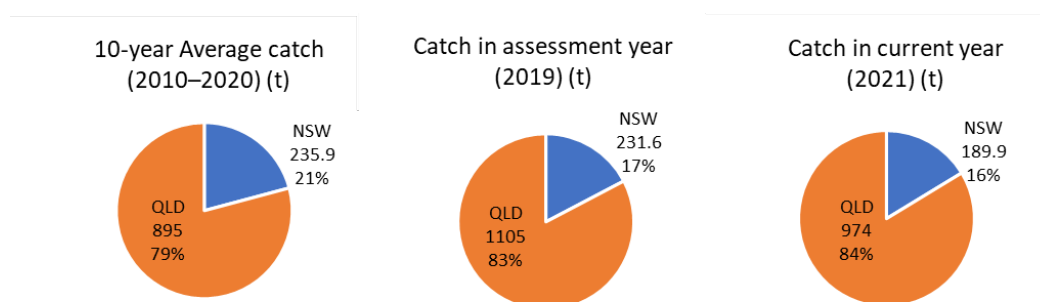


Figure 7 Breakdown of Stout Whiting total catches according to jurisdictions.

- **Species composition of NSW catch relative to predicted species composition from the preliminary TACs**

The preliminary TACs for each species used to derive the NSW basket Trawl Whiting TAC of 1,066 t for the 2021–22 fishing season, were reported by the TAF Committee as 217 t of Stout Whiting and 848 t of Eastern School

Whiting (NSW TAF Committee, 2021). These equate to 20.4% Stout Whiting and 79.6% of Eastern School Whiting. The species composition of reported landings that was realised during 2022 (after data adjustments in OZ1 and OZ2 for inaccurate species reporting) were 190 t (or 25%) of Stout Whiting and 578 t (or 75%) of Eastern School Whiting (Fig. 8). Therefore, Stout Whiting comprised a marginally larger percentage of the harvest under the combined TAC in 2022 than predicted.

The higher catch of Stout Whiting was possibly due to a shift in catch reporting by some fishers in the NFT sector to start reporting their species compositions more accurately, with greater catches of Stout Whiting being reported further south than in previous years.

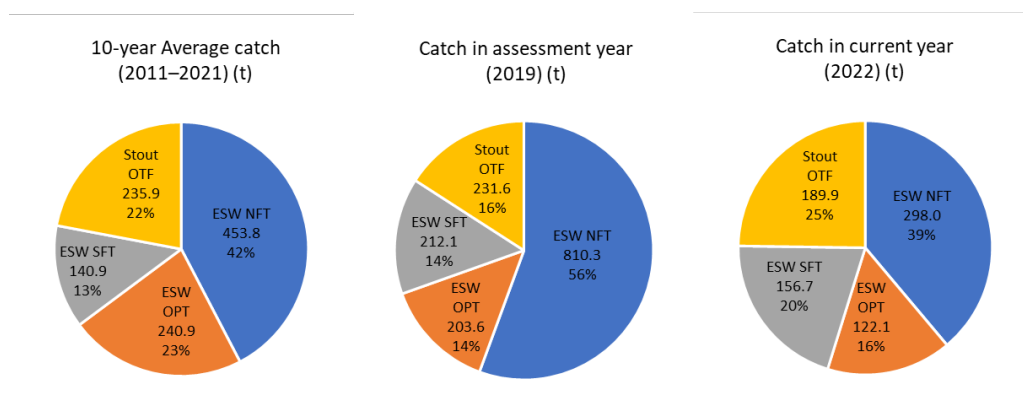


Figure 8 Breakdown of the NSW Ocean Trawl Fishery commercial catches of Eastern School Whiting (ESW) and Stout Whiting (Stout) according to species and sector. NB: Danish seine catches are included within the Northern Fish Trawl (NFT) and Southern Fish Trawl (SFT) sectors. OPT = Ocean Prawn Trawl.

- ### Standardised catch rates by fleet and weighted averages in NSW and in other jurisdictions

Since the last full assessment in 2021, Stout Whiting catch rates in the NSW OPT fleet have decreased by 7.2% (Hall, 2024). Whereas the annual standardised catch rates for the Queensland Stout Whiting Fishery increased by over 50% between 2019 and 2021, to reach the highest CPUE levels on record that were above the long-term average (Sumpter, 2022). In particular, catch rates in the northern zones (between Fraser Island the Sunshine Coast) showed the greatest increase over the two years, while those in the southern zones were already well above the long-term averages and remained steady at those elevated levels (Sumpter, 2022). No updated CPUE data were available for the current assessment year.

- ### Catch rates for the most recent fishing period relative to projected catch rates from the quantitative stock assessment

Information on projected catch rates were not available from the quantitative stock assessment to inform this current stock assessment. However, given that the model estimated the spawning stock biomass of Stout Whiting would recover from 42% of unfished biomass in 2020 to 48% of unfished biomass within 3 years (Wortmann and Hall, 2021), catch rates would be expected to increase over subsequent years. As detailed above, NSW catch rates for Stout Whiting decreased slightly by a weighted average of 7.2%, but Queensland catch rates, which take on average 80% of the total landings, have shown a considerable increase since the last full assessment. Combined, these results suggest that the biomass of the stock may be recovering towards the target; however, there is some regional variation evident.

- ### Size and age-structure of the catch

No new size and age-structure data for the commercial catches of Stout Whiting were analysed for the current assessment. However, otoliths were collected as part of a current FRDC project and will be compiled for the next update of the full stock assessment planned for 2024.

Stock Assessment Result Summary

<p>Biomass status in relation to Limit</p>	<p>The most recent full assessment for Stout Whiting in 2021 (using data up to 2020), estimated that the current spawning stock biomass was at 42% of unfished biomass in 2020 and at the level for maximum sustainable yield (MSY) (Wortmann and Hall, 2021).</p> <p>Updated standardised catch rates from the NSW part of the stock (including data up to 2022 and 2023 in this report), have remained near the long-term average over the last 3 years, despite a slight decrease over the last 2 years. Updated catch rates for the Queensland part of the stock had rapidly increased and were the highest on record in 2021 (Sumpter, 2022), although no new data were available for the last two years.</p> <p>On the basis of the above evidence, the biomass of the Stout Whiting biological stock is unlikely to be recruitment impaired.</p>
<p>Biomass status in relation to Target</p>	<p>The biomass modelling from 2021 predicted that the stock would recover from 42% to 48% of unfished biomass within 3 years if fished at an RBC of 2,018 t for the whole biological stock (Wortmann and Hall, 2021). Recent increases in Queensland catch rate indices suggest that the stock biomass may be recovering towards the target; however, the fleetwide analyses were heavily influenced by significantly increased catch rates in northern zones (Sumpter, 2022). Over the same period, NSW statewide daily CPUE indices and Queensland catch rates from southern zones remained relatively stable near or just above the long-term averages.</p> <p>In the absence of updated catch rates from Queensland and the slight decrease in catch rates for the NSW part of the stock, the assessment is uncertain about the biomass status in relation to the Target reference point.</p>
<p>Fishing mortality in relation to Limit</p>	<p>Results from the 2021 Queensland population biomass modelling suggested that current levels of harvest are below that needed to maintain the biomass at the level for MSY (Wortmann and Hall, 2021).</p> <p>On the basis of the above evidence, the current level of fishing mortality is considered unlikely to cause the biomass to become recruitment impaired.</p>
<p>Fishing mortality in relation to Target</p>	<p>Recent and current harvest levels have been below that required to rebuild the stock to the target reference point of 48% of unfished biomass.</p>
<p>Current SAFS stock status</p>	<p>Stout Whiting was assessed as a sustainable stock under the SAFS framework in 2023 (Jesson Kerr and Hall, in press).</p>

Fishery interactions

The OTF trawl fishing gears interact with other commercial and non-commercial by-catch marine species, a range of endangered, threatened and/or protected (ETP) species and marine habitats. The OTF share management plan mandates that otter trawl nets must be fitted with at least one BRD of an approved design to reduce the by-catch of small prawns and juvenile fish. Mesh size and other gear restrictions are regulated to increase the target species selectivity of otter trawl and Danish seine nets and cod ends. Research results to date suggest that these

measures significantly decrease the levels of by-catch associated with these fishing gears (Broadhurst and Kennelly, 1996; Broadhurst *et al.*, 1996, 1997, 1999, 2005, 2006).

Interactions with animals protected under the Environment Protection and Biodiversity Conservation Act 1999 include marine mammals (dolphins, seals and sea lions), seabirds, some shark species, and seahorses and pipefish (sygnathids). The ETP species that interact with the OTF were subjected to a detailed risk assessment in the environmental impact statement (EIS) for the fishery (NSW DPI, 2004). All 11 ETP species identified in the EIS were considered to be at moderate/low or low risk. An updated threat and risk assessment for all components of the NSW marine estate was completed in 2017 (Fletcher and Fisk, 2017). The OTF was considered a moderate threat to ETP species along the north coast and a low threat to ETP species along the south coast. Interactions with grey nurse sharks and sygnathids were identified as the main concerns.

Compulsory reporting in commercial logbooks of all interactions with ETP species was mandated for the OTF in 2005 and these are reported annually to the Department of Environment and Energy (NSW DPI, 2017). Data on incidental interactions with by-catch, ETP species and associated mortalities were also collected during a recent fish trawl (2014–2016) and prawn trawl (2017–2019) observer surveys.

The majority of available trawl ground in NSW waters is likely to be dominated by sandy habitat with little reef structure, and fishers typically try to avoid high topography, hard, structured habitats to prevent net damage. Large areas within NSW marine parks are closed to trawling and provide areas for habitat protection. The use of bobbins on ground ropes of fish trawl nets is prohibited north of Seal Rocks and the maximum size of bobbins is limited south of Seal Rocks to minimise damage to reef habitats. More information on the potential effects of trawl gears on the soft seabed biota is warranted, as impacts to these less protected habitats are likely to be more significant.

Stakeholder engagement

Results of the current stock assessment were presented to industry members via video conference on 15 December 2023. Feedback suggested that: discarding had increased in the prawn trawl sector since quota introduction, due to migration of quota southwards to the fish trawl sector; prawn catch rates and prices had been strong over recent years, leading to decreased targeting of whiting by the prawn trawl sector; and that data adjustments that allocate 100% of combined trawl whiting catches in OZ1 to Stout Whiting may be flawed because schools of spawning Eastern School Whiting are encountered there at certain times of the year and any fishing in deeper waters is likely to be taking Eastern School Whiting. This feedback will be incorporated into future stock assessments, but should be considered while interpreting current results.

Qualifying Comments

While current stock assessment results indicate no concerns for the status of the stock, it is pertinent to raise the following issues that should be considered when interpreting these results.

- (1) There remains ongoing uncertainty with respect to the species composition of trawl whiting catches in northern and now central NSW, which in turn increases the uncertainty in the data inputs that underpin the current biomass models. Especially given the sudden increase in Stout Whiting catches reported for the fish trawl sector in central NSW in 2020, that are possibly related to greater industry awareness of species reporting issues. Only catches in northern NSW are currently adjusted for inaccurate species reporting and these recent discrepancies suggest that a greater proportion of Stout Whiting may have been previously caught in the central region than reported. This has implications for the accuracy of the catch series for each species used in the current biomass models.
- (2) Some spatial variation in indicators was evident, with differing trends in catch rates from NSW and Queensland over recent years.

- (3) Current discard rates in NSW waters have not been assessed since quota was introduced and may be exceeding those estimated from the observer survey that were used in the biomass modelling. Anecdotal information from fishers suggests that discard rates may have changed since quota introduction.

References

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