Department of Primary Industries and Regional Development

NSW Stock Status Summary – 2024/25

Eastern School Whiting (*Sillago flindersi*)

Assessment Authors and Year

This stock status summary condenses findings for Eastern School Whiting that were detailed in the following full stock assessment report:

Hall, K.C. 2025. Stock Assessment Report 2024/25 – Eastern School Whiting and Stout Whiting (*Sillago flindersi* and *Sillago robusta*). NSW Department of Primary Industries and Regional Development – Fisheries, Coffs Harbour, 72 pp.

Stock Status

Current stock status	On the basis of the evidence contained within this assessment, Eastern School Whiting is currently assessed as **sustainable** for the NSW part of the stock.

Stock structure & distribution

Eastern School Whiting (*Sillago flindersi*, CAAB 37 330014) is a temperate inshore demersal finfish species that occurs in oceanic waters to a depth of about 100 m, from southern Queensland to South Australia, and including north-eastern Tasmania. The species is currently considered and assessed as a single, genetically diverse panmictic stock on the Australian mainland, with some genetic differentiation of Tasmanian populations (Hall *et al.*, 2024).

Scope of this assessment

This assessment of the stock status of Eastern School Whiting was completed according to the Status of Australian Fish Stocks (SAFS) criteria (Roelofs *et al.*, 2024), using data (in calendar years) up to and including 2023. Where necessary data for Eastern School Whiting were adjusted or combined with data for Stout Whiting (*Sillago robusta*), to support determination of a combined trawl whiting total allowable catch (TAC) in New South Wales (NSW) for the 2025-26 fishing season (1 May to 30 April) according to the *NSW Trawl Whiting Harvest Strategy* (NSW DPI, 2022). For the 2024-25 fishing season, the combined NSW TAC for trawl whiting was set at 1,066 t.

The Eastern School Whiting stock is shared to the south with Commonwealth, Victorian, Tasmanian and South Australian fisheries. Commonwealth fisheries have been managed by an independent TAC since 1993 under the *Harvest Strategy Framework for the Southern and Eastern Scalefish and Shark Fishery* (SESSF) (AFMA, 2021). For the 2024-25 fishing season (1 May to 30 April), the Commonwealth TAC for Eastern School Whiting was set at 914 t.

A quantitative Tier 1 stock assessment of the entire Eastern School Whiting biological stock is completed every 3-5 years, with a significant input of NSW data, including standardised CPUE series, historical length and age data and discard rate estimates (e.g., Day *et al.*, 2020). The most recent update of the Tier 1 assessment was completed in 2024 using data up to 2023 (Burch *et al.*, 2024). Therefore, the current year was considered a 'full assessment year' according to the *NSW*

Trawl Whiting Harvest Strategy (NSW DPI, 2022). This current report summarises new information on the primary biomass indicator and updates fisheries statistics, biological data and other secondary indicators for Eastern School Whiting in NSW waters.

The assessment results for Eastern School Whiting are presented here at the biological stock level – south-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 Eastern School Whiting assessed as a **sustainable stock** (Hall *et al.*, 2024).

Biology

Eastern School Whiting is a relatively fast-growing and short-lived species, reaching a maximum recorded age of 9 years (Day, 2017). While it reaches a maximum size of about 32 cm fork length (FL), few individuals in commercial catches exceed 25 cm FL (Gray *et al.*, 2014a). Maturity occurs at about 2 years of age and 15 cm FL (Gray *et al.*, 2014b), although age and size at maturity and spawning season may show some latitudinal variation (Day, 2017).

Fishery statistics

Catch information

Commercial

The bulk of the Eastern School Whiting commercial catch is taken by the NSW Ocean Trawl Fishery and Commonwealth Danish seine and trawl vessels in the SESSF in waters off New South Wales, eastern Victoria and Bass Strait (Burch *et al.*, 2024). Very small catches are also taken by coastal trawl and Danish seine fisheries in the inshore state waters of Victoria (15.4 t in 2021/22), Tasmania (41.9 t in 2021/22) and South Australia (negligible), which combined represent less than 5% of total catches (Hall *et al.*, 2024).

Annual commercial catches of Eastern School Whiting across all jurisdictions (following adjustment of NSW data for inaccurate species reporting in northern NSW) peaked around 2,500 t in the late 1980s and early 1990s and then fluctuated around a declining trend to 1,206 t in 2013 (Fig. 1). Catches rapidly increased again to above 1,700 t in the 3 years prior to quota introduction in NSW, and then decreased to a recent minimum of 1,058 t in 2021 (Fig. 1). While NSW catches have steadily increased again to over 900 t in 2023, Commonwealth catches have halved over the last 3 years and recent TACs have been considerably under-caught (Hall, 2025). The total catch across all jurisdictions in 2023 was 1,216 t.

Most of commercial catch of Eastern School Whiting from NSW waters is taken by fish and ocean prawn trawlers in the Ocean Trawl Fishery (OTF) and Southern Fish Trawl Restricted Fishery (SFT) (Fig. 2). A small number of Danish seine vessels have targeted trawl whiting in NSW since 2010 and their confidential data have been combined with fish trawl (otter trawl) data to form a combined ‘fish trawl sector’. Historically, Eastern School Whiting catches were larger for the ocean prawn trawl sector than the fish trawl sector and showed latitudinal variation across ocean zones (OZ1 to OZ10, north to south along the coastline), with larger catches in the north (OZ1 to OZ4) where the prawn trawl sector mainly operates (Figs 2 and 3). However, since 2007 this trend has gradually reversed, with recent fluctuations in the commercial catches largely influenced by northern fish trawl catches from OZ5 (Figs 2 and 3).

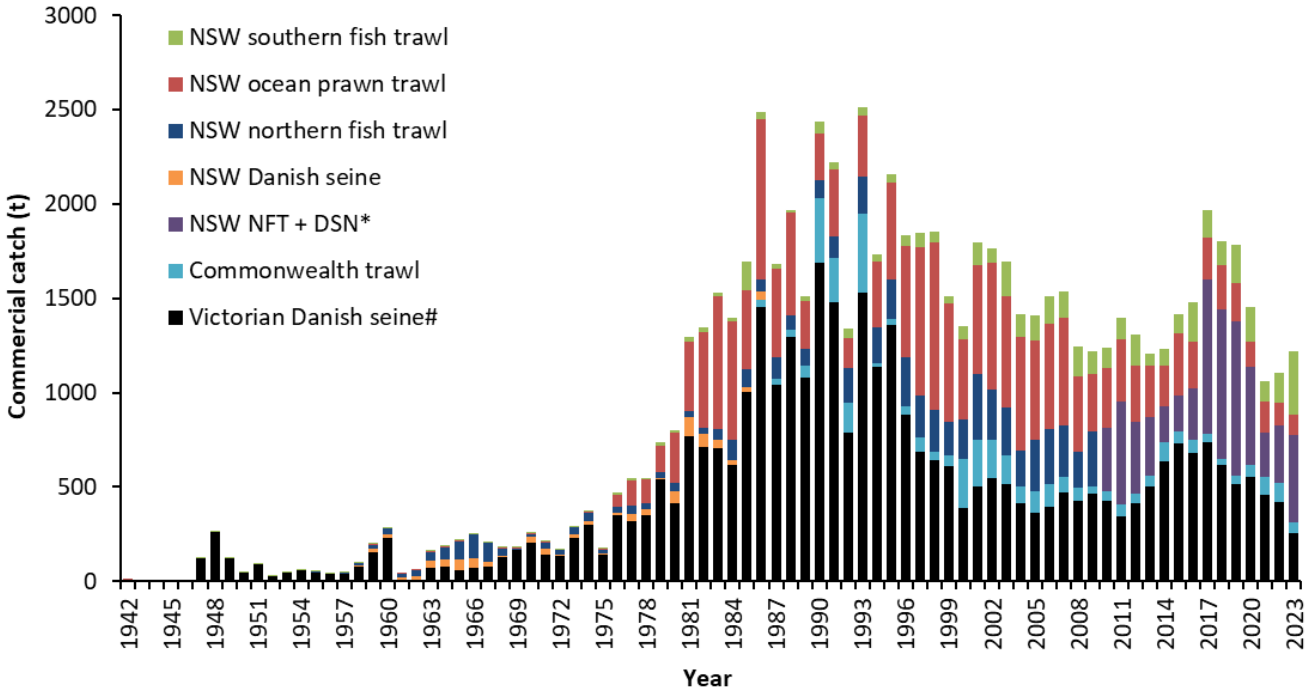


Figure 1 Annual adjusted commercial catches (tonnes) of Eastern School Whiting reported for the six main fleets. *NSW northern fish trawl (NFT) and Danish seine (DSN) catches have been combined after 2009 to ensure confidentiality. #Victorian Danish seine catches also include small amounts from Victorian, Tasmanian and South Australian state waters. Data for other jurisdictions outside of NSW are from Burch *et al.* (2024).

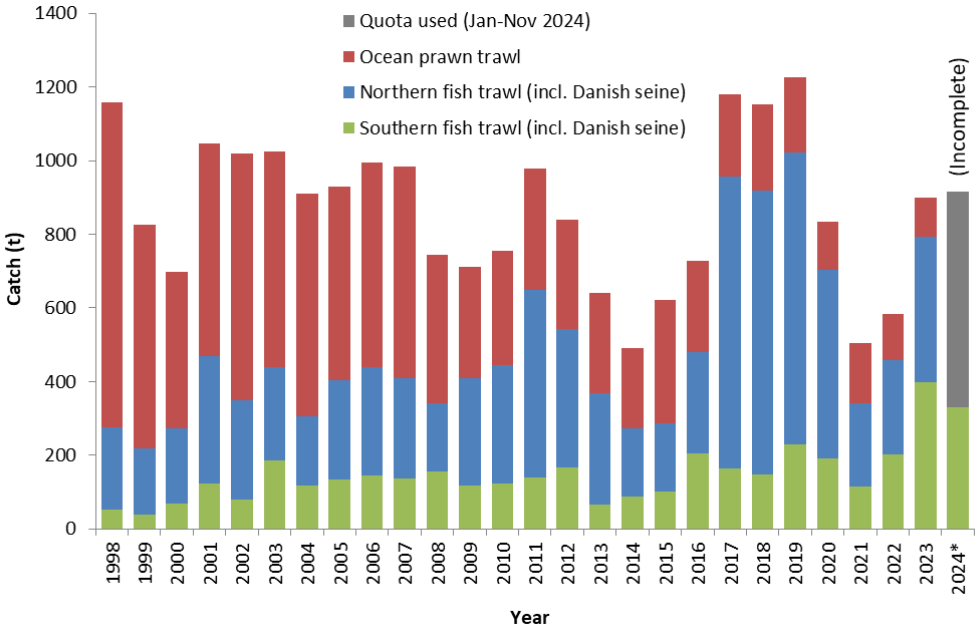


Figure 2 Annual adjusted commercial catches (tonnes) of Eastern School Whiting in NSW waters (1998–2024) for different sectors of the NSW Ocean Trawl Fishery (ocean prawn trawl and northern fish trawl) and the Southern Fish Trawl Restricted Fishery. *Data for 2024 are incomplete and the estimated quota used north of Barrenjoey Point between January and November 2024 is indicated.

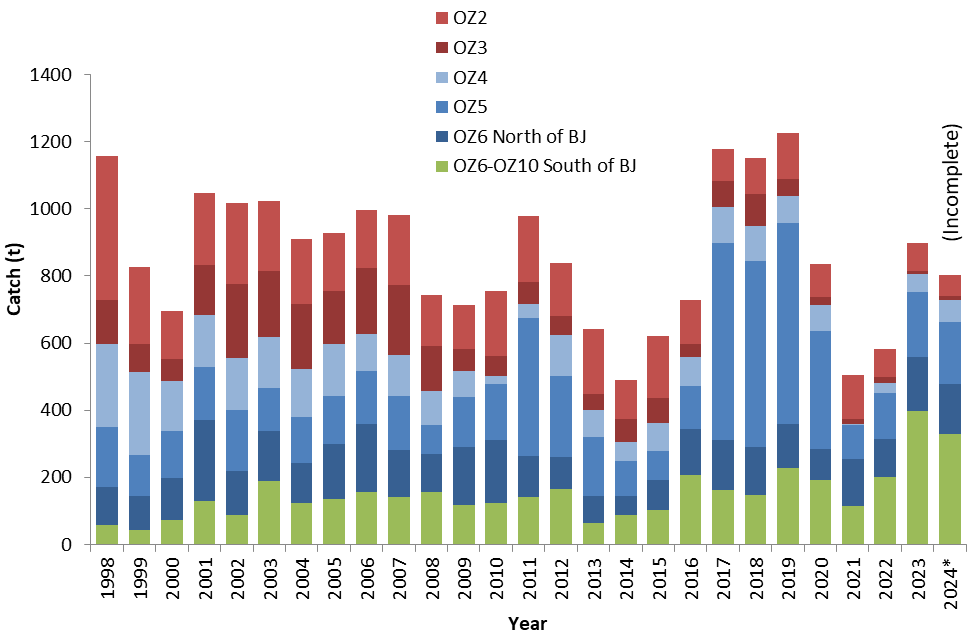


Figure 3 Annual adjusted commercial catches (tonnes) of Eastern School Whiting from the NSW Ocean Trawl Fishery (1998–2024) and Southern Fish Trawl Restricted Fishery reported in different fishing zones (OZ1–OZ10), each covering one degree of latitude from north to south. Catches in OZ6 were divided into amounts taken from north and south of Barrenjoey Point (BJ) and for zones south of BJ data were aggregated for confidentiality reasons. *Data for 2024 are incomplete.

Recreational & Charter boat

Recent estimates of recreational catches of combined trawl whiting (Eastern School Whiting and Stout Whiting) from NSW waters have been 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. Nevertheless, the most recent estimate of the recreational harvest of combined trawl whiting in NSW was approximately 259 (± 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 (± 4,040) fish in 2019/20, 10,933 (± 8,016) fish in 1917/18 and 4,995 (± 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 Eastern School 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 Eastern School Whiting was reported on at least one day.

The annual reported effort for Eastern School whiting by the ocean prawn trawl sector has declined rapidly from 12,628 fisher days in 1998 to 4,978 fisher days in 2009 (Fig. 4). After the reporting change to daily event records in July 2009, effort became more stable between 2010 and 2018, after which it declined again following more recent structural reforms and quota introduction in 2019. Ocean prawn trawl effort for Eastern School Whiting was 2,450 fisher days and 13,368 fisher hours in 2023, which represented just 19.4% of the total effort in 1998 (Fig. 4).

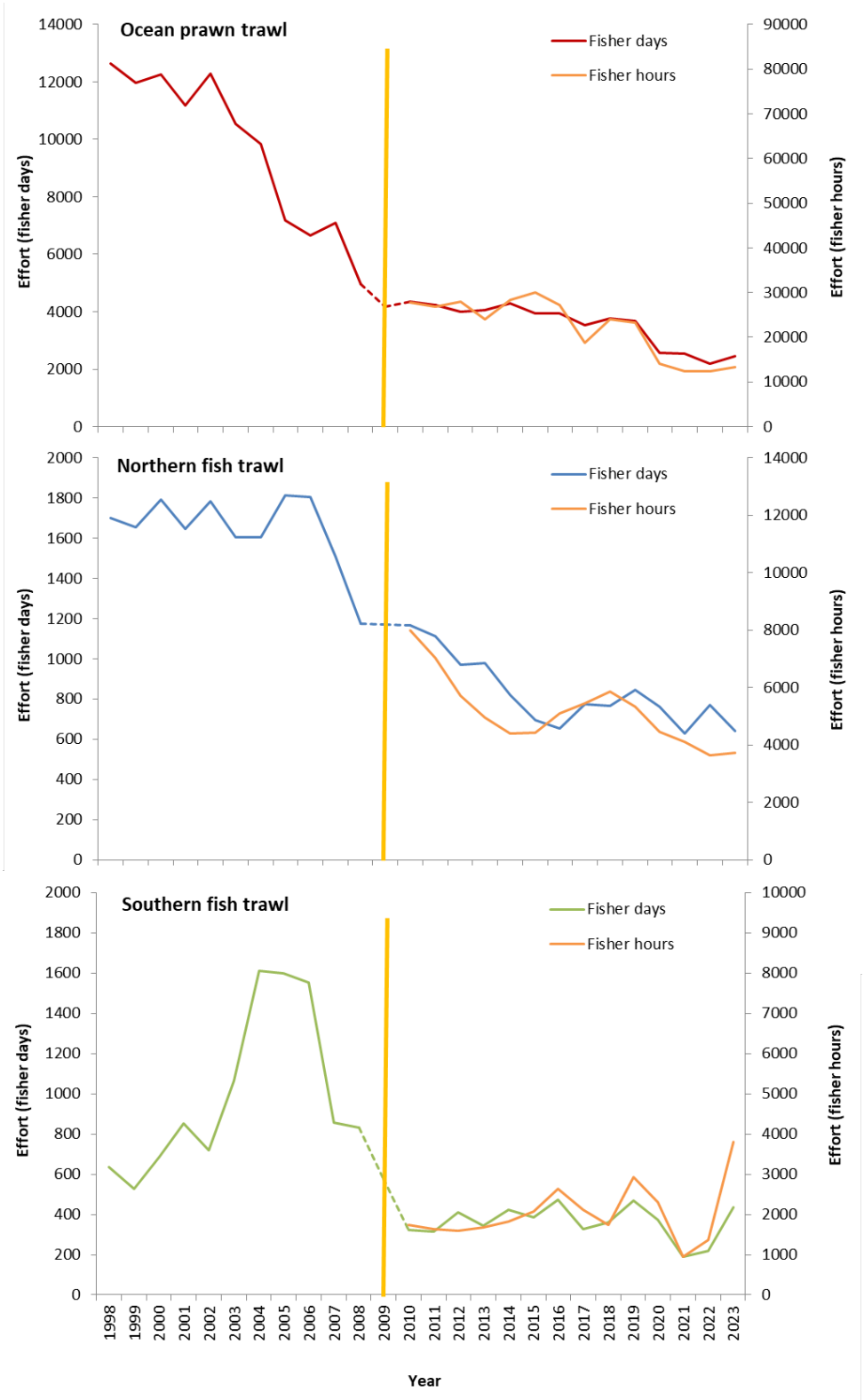


Figure 4 Annual adjusted effort (fisher days and fisher hours) for fishers in the ocean prawn trawl (top) and northern fish trawl (middle) sectors of the NSW Ocean Trawl Fishery and Southern Fish Trawl Restricted Fishery (bottom), that reported landing Eastern School Whiting on at least one day in a given month.

In contrast, reported effort for Eastern School Whiting in the northern fish trawl sector remained stable during the early 2000s with a peak of 1,804 fisher days in 2005, and then declined rapidly between 2006 and 2010 to 1,172 fisher days and again following quota introduction in 2019 (Fig. 4). Reported effort in the northern fish trawl was 640 fisher days and 3,734 fisher hours in 2023.

Reported effort for Eastern School Whiting in the southern fish trawl sector show a different pattern, with effort still rising during the early 2000s to reach a peak of 1,613 fisher days in 2004, followed by a rapid decline between 2006 and 2010 to just 323 fisher days (Fig. 4). Between 2010 and 2020 effort was more stable before decreasing in 2020 and 2021 and then rapidly increasing over the last 2 years. Reported effort in the southern fish trawl was 434 fisher days and 3,806 fisher hours in 2023.

Catch rate information

Standardised catch rates (catch-per-unit-effort, CPUE) for Eastern School Whiting taken by the ocean prawn trawl and northern and southern fish trawl (excluding Danish seine) sectors 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.

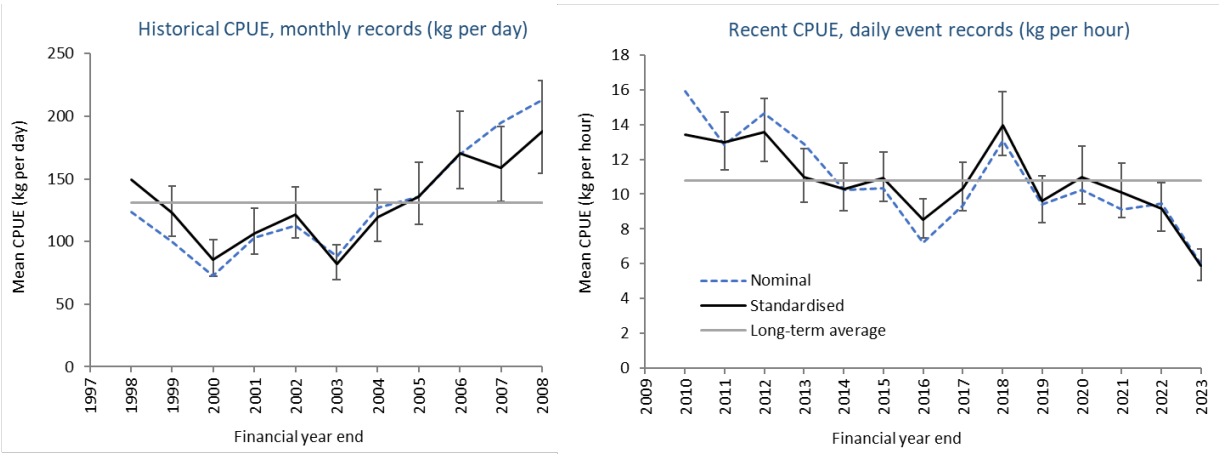
The mean standardized catch rates of Eastern School Whiting were lower in the prawn trawl sector compared to the northern and southern fish trawl sectors, although historically they were more comparable (Fig. 5). The sectors operate in mostly different waters, use different gears and vary in targeted fishing practices, which account for these differences. The temporal trends in the average CPUE series of the three fleets also vary over the last 22 years.

Historical catch rates of the ocean prawn trawl sector (averaged across ocean zones) declined between 1998 and 2000 to below the long-term average, then steadily increased over the next 8 years to be well above the historic average in 2008 (Fig. 5). This suggests that the stock in northern NSW may have initially declined following the peak catches in the late 1990s, but then recovered. Alternatively, changes to the legislated whiting codend configurations may have also influenced the increase in catch rates (Graham *et al.*, 2009). Trends in more recent mean CPUE show a decrease from 2010 to 2016, a spike in 2018 and then have declined from 2019 to finish below average in 2023 (Fig. 5).

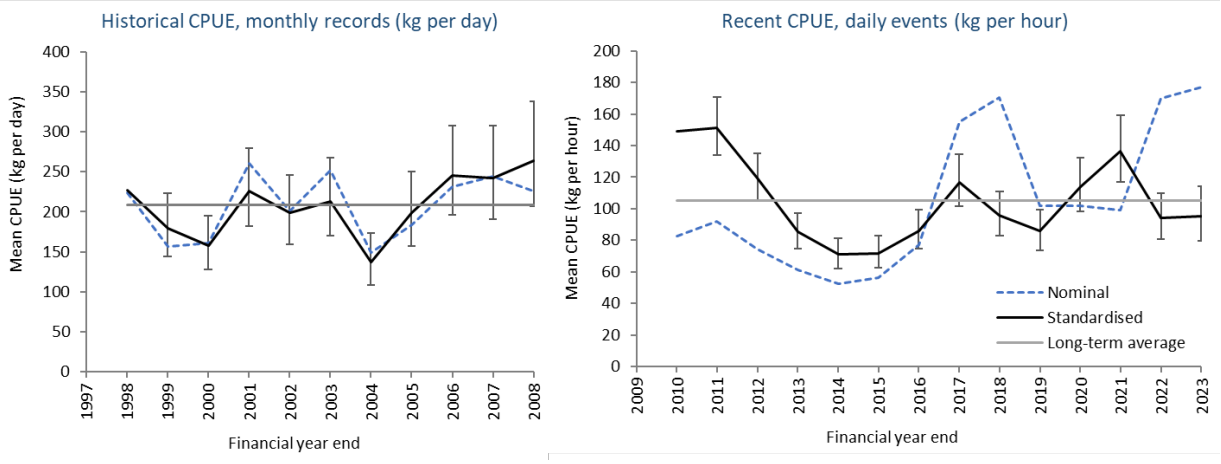
Historical catch rates of the northern fish trawl sector (averaged across ocean zones) fluctuated around the long-term average in the early 2000s and then steadily increased between 2004 and 2008 (Fig. 5). More recently, mean CPUE decreased between 2011 and 2014, then followed an upward trend, and has fluctuated near the long-term average over the last 7 years (Fig. 5). Historical catch rates of the southern fish trawl sector are based on a small number of records and are highly variable, but also show an increasing trend towards 2008. Recent catch rates since 2015 have steadily increased and have been above average over the last 3 years (Fig. 5).

Catch rate series for the two Commonwealth fleets have shown diverging trends over the last six years with Danish seine catch rates showing a declining trend and trawl catch rates increasing considerably (Sporcic, 2024).

Ocean prawn trawl (excluding OZ2)



Northern fish trawl



Southern fish trawl

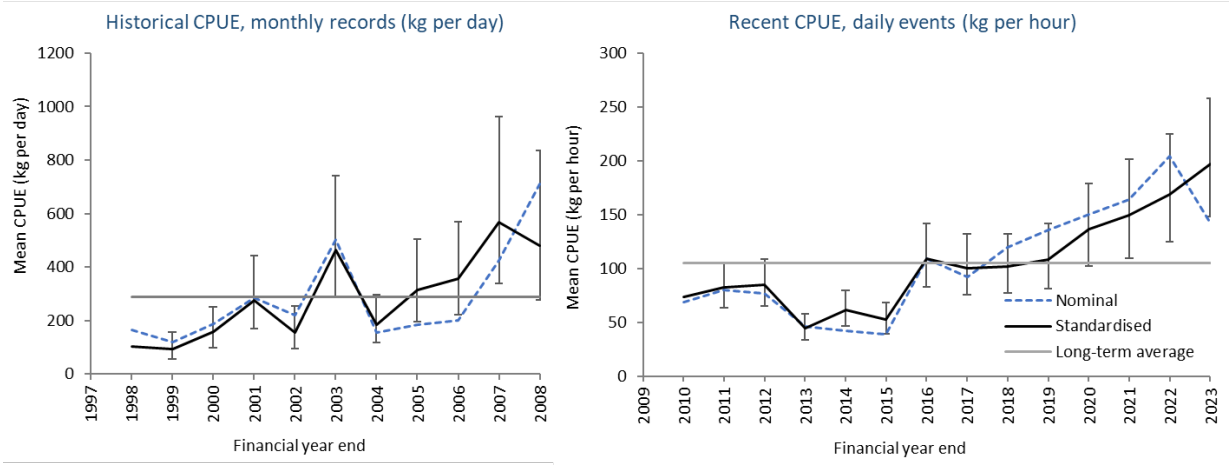


Figure 5. Mean standardised catch rates (catch-per-unit-effort, CPUE) of Eastern School Whiting for the ocean prawn trawl (excluding ocean zone 2, top) and northern fish trawl (middle) sectors of the NSW Ocean Trawl Fishery and Southern Fish Trawl Restricted Fishery (bottom), estimated from monthly records (1998–2009) in kg per day (left) and from daily events (2010–2023) in kg per hour (right). The dashed and solid lines indicate the nominal and standardised mean CPUE (± 95% confidence intervals), respectively; and the grey horizontal line indicates the long-term averages for each series.

Stock Assessment

Stock Assessment Methodology

Year of most recent assessment:

The most recent update of the Tier 1 stock assessment for Eastern School Whiting was in 2024 using data up to 2023 (Burch *et al.*, 2024). Therefore, the current year is considered a 'full assessment year' according to the NSW harvest strategy (NSW DPI, 2022).

Assessment method:

The 2024 update of the Eastern School Whiting stock assessment applied an integrated age-structured population dynamic model using Stock Synthesis v. 3.30.22.1 (Methot *et al.*, 2024). The base-case model was a single region model for the whole stock and comprised six fleets: Victorian Danish seine (with minor catches from Victorian, Tasmanian and South Australian state fisheries), Commonwealth Trawl, NSW ocean prawn trawl, NSW northern fish trawl, NSW southern fish trawl and NSW Danish seine.

Main data inputs:

Separate catch, size, age and discard data were included for all fleets and separate CPUE indices were available for all but the NSW Danish seine fleet . Selectivity parameters were estimated for each fleet, but biological parameters were estimated for the whole stock.

Commercial landings – reported annual catch, taken from fisher logbooks of various sources compiled into six fleets – Commonwealth Danish seine (combined with Tasmanian, Victorian and South Australian state catches); Commonwealth otter trawl; NSW prawn trawl and NSW northern fish trawl (north of Barrenjoey Point to the continental shelf); NSW southern fish trawl (south of Barrenjoey Point to 3 nm from the coastline) and NSW Danish seine; 1942–2023. For the model estimated RBC projections, the 2024 total catch was assumed to be equivalent to the 2023 catch.

Estimated discard rates – from onboard observer programs for five fleets (excluding NSW Danish seine, which was assumed to have zero discarding); Commonwealth data available 1994–2023, with some years missing; NSW data for two time periods (1990–1995 and 2014–2019).

Commercial catch rates – reported annual CPUE data for five fleets – Commonwealth Danish seine (in kg per shot, 1986–2023), Commonwealth trawl (in kg per hour, 1995–2023), NSW prawn trawl, northern and southern fish trawl (in kg per day from monthly records, 1998–2008 and kg per hour from daily events, 2010–2023). Standardised catch rates for the NSW prawn trawl excluded data from OZ2, to remove possible influences of inaccurate species reporting and adjustment for Stout Whiting catches in northern NSW.

Length compositions – from Commonwealth and NSW fleets for retained and discarded catches from onboard observer programs (weighted by number of shots, 1990–2023); and for retained catches from port monitoring (weighted by number of trips, 1951–2023, with many early years missing).

Age-at-length and ageing error data – from sectioned otoliths processed by Fish Ageing Services Pty Ltd for Commonwealth samples (1991–2023, some years missing); and processed by the NSW DPI ageing laboratory for NSW samples (three time periods, 2006–2007, 2015–2016 and 2019–2023).

Life-history parameters – many were estimated during the modelling (e.g., all four von Bertalanffy growth parameters, recruitment and selectivity parameters for each fleet); others were taken from relevant literature (e.g., age and size at sexual maturity of 2 years and 16 cm FL, fecundity assumed to be proportional to spawning biomass, natural mortality fixed at M=0.6, steepness of the stock-

recruitment relationship set at h=0.75 and length–weight relationship parameters of a=1.32 x 10^{-5} and b=2.93) (Burch *et al.*, 2024).

Key model structure & assumptions:

- **Population biomass modelling**

Assumptions included: a single-sex model (length data are not available by sex); single season of spawning assumed across the whole stock; that the population was at an unfished biomass and equilibrium age-structure at the start of 1942; 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; selectivity is logistic for all fleets; and average annual recruitment follows a Beverton–Holt stock–recruitment relationship. For more details on model assumptions see Burch (2024) 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:

Nineteen sensitivity analyses were completed for the base-case model (Burch *et al.*, 2024), including changing the NSW prawn trawl catch series to an alternative series produced from the mean of five modelling approaches (outlined in Hall, 2025). For further details on model specification and sensitivities explored for the base-case model, please refer to Burch *et al.* (2024).

Due to some conflicting trends in recent CPUE series across the six fleets, whereby the Victorian Danish seine catch rates have declined over the last 9 years while the Commonwealth trawl and NSW southern fish trawl catch rates have increased substantially, two alternative regional models were also assessed. The data were split, and a separate model developed for the Victorian Danish seine fleet and another for the remaining fleets that primarily fish in NSW waters. Specifications and parameters for the two split complementary models largely followed those of the base-case model (Burch *et al.*, 2024).

Status Indicators - Limit & Target Reference Levels

The stock status of Eastern School 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, with a trigger reference point of 35% of unfished spawning stock biomass.
Fishing mortality indicator or proxy	Spawning potential ratio (1-SPR) as a proxy for fishing mortality integrated across all fleets in the fishery, estimated every 3–5 years from population biomass modelling; 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 (Flim) above which overfishing is occurring and biomass is depleting toward Blim.
Fishing Mortality Target Reference Point	Level of fishing mortality (Ftarg) that would result in a spawning stock biomass of Btarg.

Stock Assessment Results

Changes to the model structure in 2024, included an increase in the maximum modelled length from 25 cm to 30 cm, which resulted in an increase in the estimated growth rate and overall productivity of the stock (Burch *et al.*, 2024). This produced a considerably larger unfished biomass estimate than the previous five-fleet model (Day *et al.*, 2020).

The two separate regional models produced better fits to some data than the combined model, but poorer fits to other data and some spurious outcomes. In particular, the separate Victorian model provided a poorer fit to the recent declines in CPUE and the separate NSW model was largely driven by the recent increases in CPUE for the Commonwealth Trawl and southern fish trawl sectors, despite these sectors only taking a relatively small amount (on average <30%) of the total catch. Therefore, further development of the alternative models was deemed necessary, and the combined model was selected as the base-case assessment (Burch *et al.*, 2024).

The results of the 19 sensitivity analyses for the base-case model, suggested that changes to some of the fixed parameters had a significant influence on model fits and stock status, with estimates of spawning stock biomass ranging between 42% and 66% (Burch *et al.*, 2024). Results were particularly sensitive to adjustments in the natural mortality estimates, *M*, and the size at 50% maturity, and robust to changes in stock-recruitment steepness (h). Changing the NSW prawn trawl catch series to the new modelled data had little effect on model outcomes, with an identical spawning biomass and depletion estimate as the base case, which included the prawn trawl catch series estimated by the historical rules.

Stock Assessment Result Summary

Biomass status in relation to Limit	The updated joint Tier 1 stock assessment for Eastern School Whiting in 2024 (using data up to 2023) resulted in a six-fleet base-case model that estimated the spawning stock biomass of Eastern School Whiting to be at 48% of unfished biomass in 2024 and increasing to 54% of unfished biomass in 2025, assuming 2024 catches are the same as those in 2023 (Burch *et al.*, 2024). These estimates are well above the limit reference point of 20% of unfished biomass. On the basis of the above evidence, the biomass of the Eastern School Whiting stock is unlikely to be recruitment impaired.
Biomass status in relation to Target	The most recent estimate of current spawning stock biomass depletion in 2024 suggests that the stock is at or above the target reference point of 48% of unfished biomass. Model projections under a fixed average recruitment scenario and assuming the full RBC is harvested each year, predict the spawning stock biomass will remain above the target reference point until 2027 (Burch *et al.*, 2024).
Fishing mortality in relation to Limit	The revised recommended biological catches (RBCs) estimated by applying the 20:35:48 harvest control rule in the updated Tier 1 assessment were 3,086 t in 2025 and 2,961 t in 2026, with a 2-year average of 3,023 t and long-term yield of 2,830 t. Commonwealth catches of Eastern School Whiting have halved over the last 3 years and NSW catches north of Barrenjoey have been limited by the NSW TACC. Consequently, total harvest levels across all jurisdictions, including estimated discards, were

	1,375 t in 2021, 1,425 t in 2022 and 1,558 t in 2023, which were well below the previous estimated 3-year average RBC of 2,237 t (Day *et al.*, 2020) and updated estimates above. On the basis of the above evidence, the current level of fishing mortality is considered unlikely to cause the biomass to become recruitment impaired.
Fishing mortality in relation to Target	Results of the updated Tier 1 assessment in 2024 indicate, through the spawning potential ratio, that fishing mortality has been under the target level during the last 3 years (Burch *et al.*, 2024).
Current SAFS stock status	Eastern School Whiting was assessed as a **sustainable stock** under the SAFS framework in 2023 (Hall *et al.*, 2024).
Current Commonwealth stock status	The Commonwealth part of the stock was also assessed as **not overfished** and **not subject to overfishing** in 2023 based on the Tier 1 stock assessment results from 2020 (Emery *et al.*, 2024).

Fishery interactions

The NSW Ocean Trawl Fishery 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 Ocean Trawl Fishery share management plan mandates that otter trawl nets must be fitted with at least one bycatch reduction device of an approved design to reduce incidental catches 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 Ocean Trawl Fishery 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 Ocean Trawl Fishery 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 Ocean Trawl Fishery 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 the most 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 12 December 2024. Feedback suggested that: prawn catch rates and prices had been strong over recent years, leading to decreased targeting of whiting by the prawn trawl sector and some increased discarding since quota introduction, due to migration of quota southwards to the fish trawl sector; 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 in northern NSW 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 also be considered while interpreting current results.

Qualifying Comments

The following are important considerations for interpreting the stock assessment results for determining a basket TACC for Eastern School Whiting and Stout Whiting in NSW waters:

- The two most recent updates of the joint Tier 1 stock assessment for Eastern School Whiting in 2020 and 2024 and the Queensland quantitative stock assessment in 2021 for Stout Whiting included increased amounts of NSW data.
- Outcomes from these assessments are considered relevant for determining stock statuses and informing TACC determination in NSW waters. Including greater quantities of age and length data from NSW waters in future assessments will strengthen their relevance over time.
- Estimates of Eastern School Whiting spawning stock biomass from population modelling have varied considerably between successive assessments. The species is short-lived and is subject to population fluctuations in response to variations in recruitment indices.
- The uncertainty in the species composition of NSW catch histories should be considered when interpreting the results of stock assessments.
- Ongoing inaccurate reporting of multi-day trips as single fishing events further compromise the accuracy of current NSW catch-rate data.
- Improving the accuracy of whiting species composition, location of capture and effort reporting will help improve the quality of future stock assessments.
- Temporal and spatial variation in discard rates of both species in NSW waters differ from those in other jurisdictions and have likely changed again since quota introduction and are another source of uncertainty in the NSW harvest data that are not adequately accounted for in assessments.
- With a basket TACC and inaccurate reporting of separate catches for each species, there is an increased risk of undetected depletion in one of the stocks, especially if the distribution of fishing effort or species distributions change.
- While genetic and otolith chemistry results suggest a single biological stock exists for Eastern School Whiting on the mainland, regional variation in trends in catch rates and catches of both species suggest that some finer-scale population dynamics in response to exploitation or variable recruitment patterns may be occurring.
- Data assessed in this report date only as far back as 1941. Trawl fishing in NSW waters is known to have occurred since at least 1920. Before export markets for trawl whiting developed in the 1970, they were considered trash fish and likely had high discard mortality despite the small landings reported. No attempt was made to account for any extra historical

discard mortality (above that proportional to catch sizes) in the modelling and stocks were assumed to be at their unfished biomass at the start of the catch time series.

References

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