



Pilbara Demersal Scalefish Resource

Fisheries Science Update – November 2023

Key points: 2023 stock assessment outcomes

- The Pilbara Demersal Scalefish Resource (PDSR) spans from the North West Cape to 120°E and comprises over 60 demersal scalefish species, including indicator species red emperor, rankin cod, and bluespotted emperor.
- The PDSR is accessed by recreational fishers, charter operators and three commercial fisheries: Pilbara Fish Trawl (Interim) Managed Fishery, Pilbara Trap Managed Fishery, and the Pilbara Line Fishery.
- The PDSR is a key 'food bowl' for Western Australia, supplying the local market with about 2,500 tonnes of demersal scalefish annually.
- The PDSR provides unique and valuable recreational fishing opportunities at locations such as the Montebello and Mackerel Islands, and the Dampier Archipelago.
- The status of the PDSR is assessed by the Department of Primary Industries and Regional Development (DPIRD) via weight of evidence stock assessments undertaken every 3 to 5 years.
- The assessment of red emperor in the Pilbara region is the most comprehensive finfish assessment in WA due to an extensive timeseries of catch and biological data.
- The 2023 stock assessment shows that there are significant sustainability concerns for red emperor and goldband snapper and management action is required to reduce fishing pressure and begin recovery.

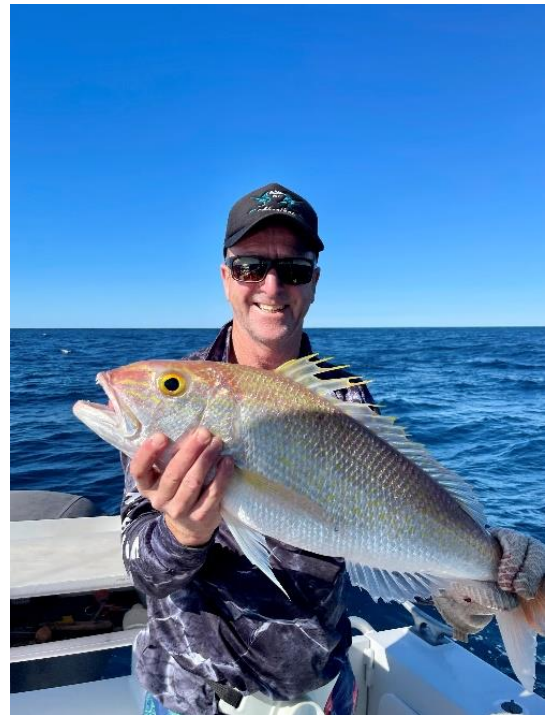
Pilbara Demersal Scalefish Resource Management

The PDSR is a part of the broader North Coast Demersal Scalefish Resource (NDSR) and stretches across approximately 950 km of coastline, including key towns such as Onslow, Karratha, and Port Hedland.

The PDSR includes over 60 demersal scalefish species and is fished by the commercial and recreational (including charter) fishing sectors. Commercial fishing for demersal scalefish in the Pilbara is undertaken by the Pilbara Fish Trawl Interim Managed Fishery (PFTIMF), Pilbara Trap Managed Fishery (PTMF), and the Pilbara Line Fishery (PLF).

Most of the local scalefish seafood supply to the WA market comes from the NDSR.

The PDSR is managed in accordance with North Coast Demersal Scalefish Resource Harvest Strategy (2017-2021) with catch limits outlined for the commercial fisheries, however there is no formal catch allocation between the commercial and recreational sectors.



Scientific monitoring and assessments

To monitor and assess the PDSR, an ‘indicator species’ approach is undertaken. Indicator species are chosen based on attributes such as vulnerability to fishing, and their commercial, social and/or cultural importance.

For the Pilbara region, these species are red emperor (*Lutjanus sebae*), bluespotted emperor (*Lethrinus punctulatus*), and rankin cod (*Epinephelus rankini*). The relative spawning biomass of indicator species is assessed against the target, threshold, and limit levels. If biomass drops below the threshold or limit, harvest control rules guide what management actions are required to recover the species (Figure 1).

Did you know?

The assessment of red emperor in the Pilbara is the most comprehensive finfish assessments in WA due to the extensive timeseries of catch and biological data.

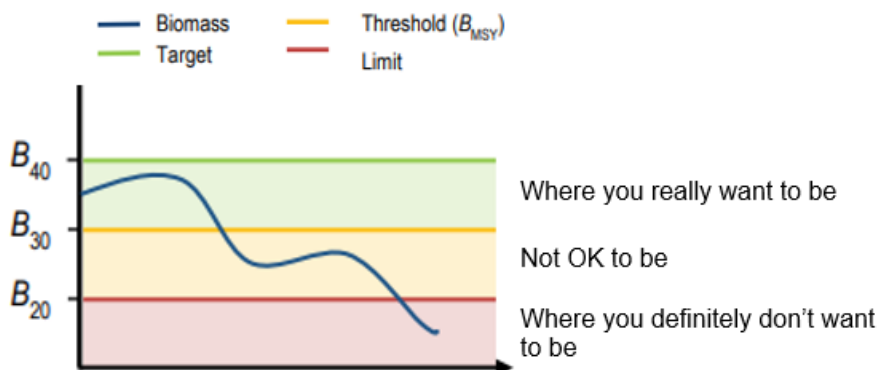


Figure 1. Graphical illustration of how the performance of indicator species is assessed.

Secondary (non-indicator) species, such as goldband snapper (*Pristipomoides multidens*; an indicator species in the Kimberley component of the NDSR), are also periodically assessed.

Historically, foreign fishing fleets have accessed the Pilbara under an international agreement with annual catches of demersal scalefish peaking at close to 25,000 tonnes in the 1970s. After the ceasing of foreign fishing in 1989, the PDSR was considered to be in a seriously depleted state. In 2010/2011, the PFTIMF took a ~20% reduction in fishing effort and the resource had been in the rebuilding phase until 2019, when catches began to decline.

Finfish weight-of-evidence stock assessments

Assessments of scalefish stocks in WA include a range of analyses that provide an understanding of stock status, including:

- Evaluating trends in commercial, recreational and charter catches over time.
- Analysis of catch per unit effort information as a proxy for stock abundance.
- Analysis of biological information collected by fishery-dependent (catches) and fishery-independent (research) sampling to evaluate length and age compositions and estimate growth, length and age at maturity, and selectivity by fishing gear.
- Fitting stock assessment models of varying complexity to available data to provide estimates of fishing mortality and relative spawning biomass to compare with internationally recognised reference points.

For each assessment, a 'weight-of-evidence' approach is used, this considers all available information, and evaluates the outputs from each analysis to determine the current status of stocks, and the risk of future depletion. This information is reviewed against the Harvest Strategy to determine if a management response is required.

Taking stock – the latest science

The 2023 Pilbara weight-of-evidence stock assessment of red emperor, bluespotted emperor, and goldband snapper included catch and biological information collected up to 2022. The science shows the **relative female spawning biomass** for:

- **bluespotted emperor** sits between the target and threshold levels, is a sustainable stock with projected increases in relative spawning biomass in the future (Figure 2).
- **red emperor** has breached the limit reference level, is considered a depleted stock, and requires management action to begin recovery (Figure 2).
- **goldband snapper** has breached the threshold reference level, is considered a depleting stock, and requires management action to begin recovery (Figure 3).



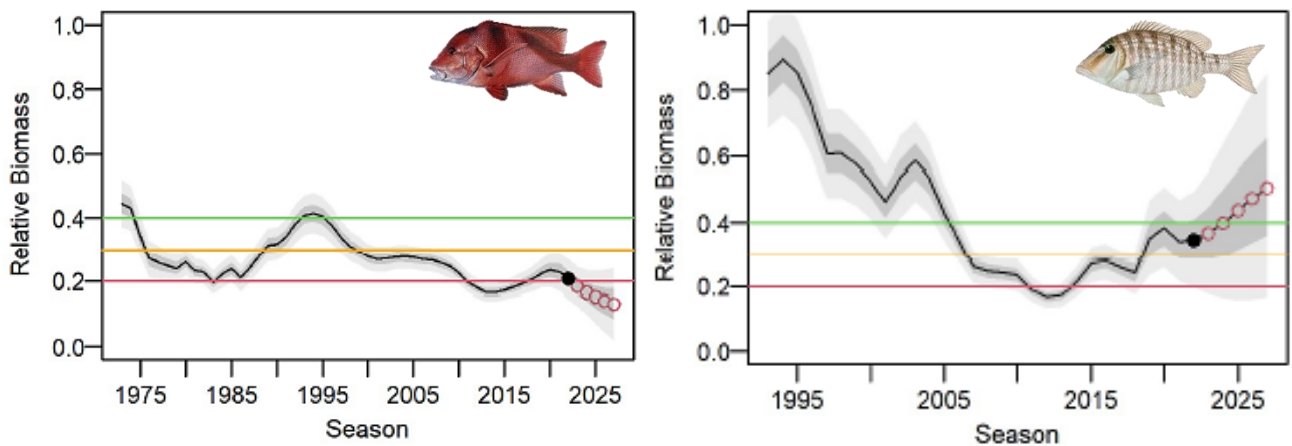


Figure 2. Model estimates for relative female spawning biomass ($\pm 60\%$ CI*) of red emperor (left) and bluespotted emperor (right) at the stock level against Target (green), Threshold (yellow) and Limit (red) reference levels, projections of future trajectories in spawning biomass (red circles) are based on current catch levels and estimated total mortality.

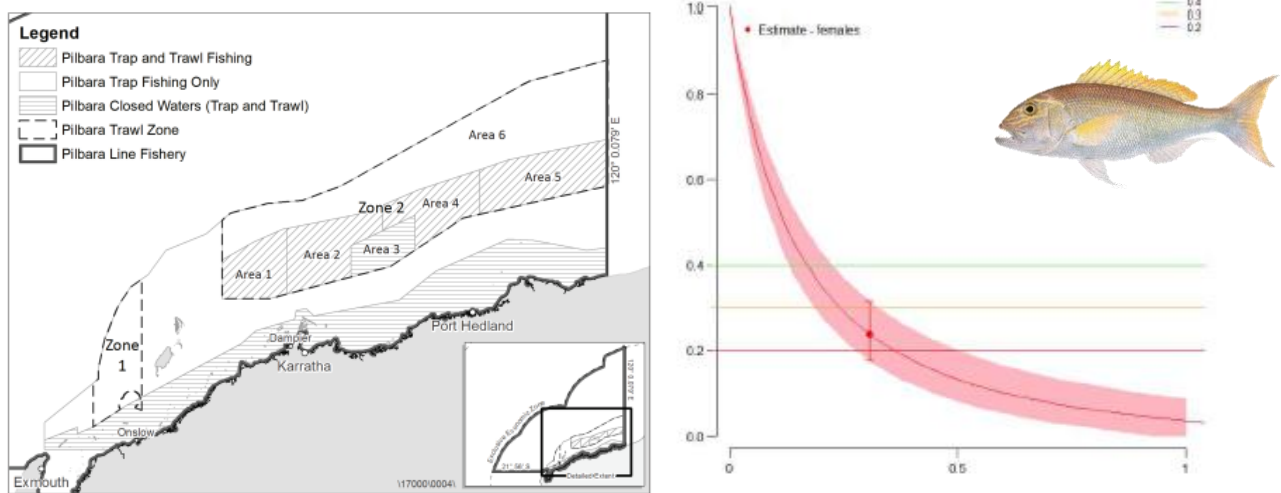


Figure 3. Map showing boundaries of the three commercial fisheries operating in the Pilbara (left) and estimate of relative female biomass (B_{rel}) for the Pilbara goldband snapper stock (right). Red, yellow, and green horizontal lines refer to limit ($B_{rel}=0.2$), threshold ($B_{rel}=0.3$) and target ($B_{rel}=0.4$) reference points, respectively.

Age and size composition

The science shows the red emperor stock is dominated by relatively young fish (less than 10 years old; Figure 4), with an age range of two to 25 years (maximum estimated age of 40 years). Approximately 5% (by weight) of commercial red emperor catch is discarded due to being under the minimum legal-size limit of 410 mm, with the associated discard mortality likely to be high due to shark depredation and/or barotrauma. Goldband snapper shows a similar trend with stock dominated by fish younger than 10 years old. With no minimum legal-size limit, most commercial catch is retained.

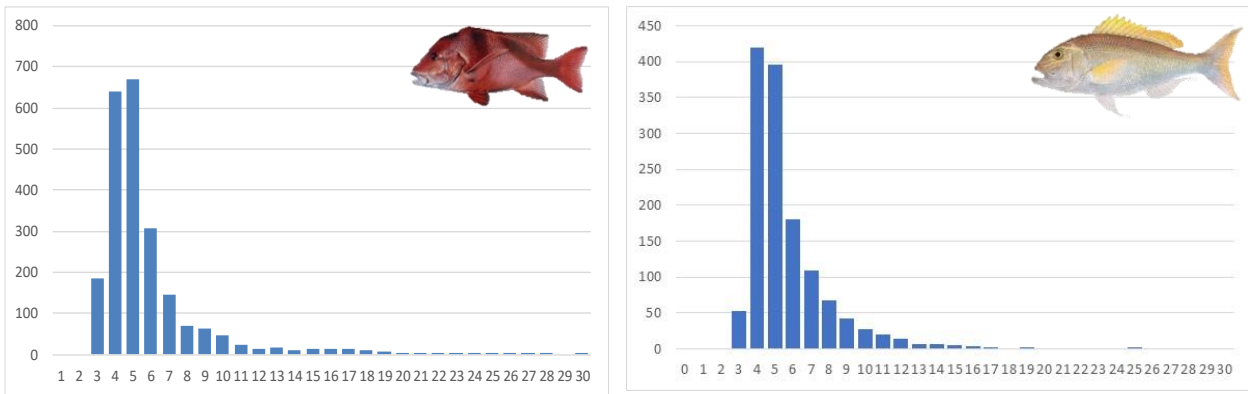


Figure 4. Age composition for red emperor (left) and goldband snapper (right) from 2019/20.

Trends in commercial and recreational catches

Catch of red emperor, bluespotted emperor, and goldband snapper are greatest in the commercial sector with catches of red emperor and bluespotted emperor increasing between 2015 and 2019 (Figure 5). There has been a notable decline in catch rates of both red emperor and bluespotted emperor from 2019 onwards.

Commercial fishers landed an average of 2,500 tonnes of demersal scalefish (98% of total catch of all species) with annual catches in recent years above the catch limits outlined in the Harvest Strategy in all management areas.

Retained catch of demersal scalefish by recreational and charter fishers has been approximately 40 tonnes each annually since 2017. A high proportion of recreationally caught red emperor and bluespotted emperor are released and there are high anecdotal rates of shark depredation, which contributes to the overall fishing mortality.

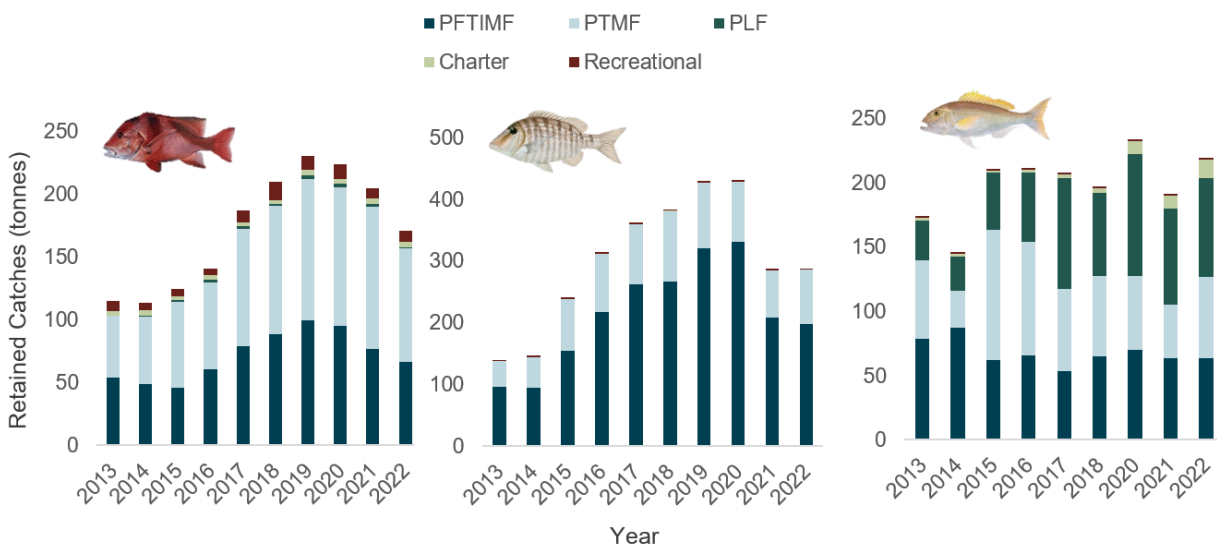


Figure 5. Retained catch (tonnes) for commercial (PFTIMF, PTMF, and PLF), recreational and charter fishing sectors in the Pilbara waters for red emperor (left), bluespotted emperor (middle), and goldband snapper (right) for the past 10 years (2013-2022).

So, what next?

Action is required to commence recovery of the PDSR. A review process is underway, and DPIRD are engaging with stakeholders to develop management arrangements and a recovery plan.

Any proposed changes to management arrangements for the PDSR will be subject to consultation with relevant stakeholders and approval by the Minister for Fisheries.

A Fisheries Research Report which provides detailed information on the 2023 stock assessment will be published in 2024.

DPIRD wishes to thank commercial, charter and recreational fishers who continue to contribute important catch and fishing information to help in the monitoring and assessment of the PDSR.



For more information, visit www.fish.wa.gov.au.

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