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# PART 1: INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

**WCPFC-SC19-AR/CCM-01**

**AUSTRALIA**

Australian Government
Department of Agriculture, Fisheries and Forestry

ABARES

# Annual report to the Western and Central Pacific Fisheries Commission

## Part 1: Information on fisheries, research and statistics 2022 Australia

**S. Blake and H. Patterson**

Research by the Australian Bureau of Agricultural and Resource Economics and Sciences

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**Acknowledgement of Country**

We acknowledge the Traditional Custodians of Australia and their continuing connection to land and sea, waters, environment and community. We pay our respects to the Traditional Custodians of the lands we live and work on, their culture, and their Elders past and present.

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# Summary

Australian commercial fisheries for highly migratory species in the Western and Central Pacific Fisheries Commission (WCPFC) Convention Area are managed as part of the Eastern Tuna and Billfish Fishery (ETBF) (a mainly longline fishery with a smaller minor line component) and Eastern Skipjack Fishery (a purse seine fishery). Most fishing occurs in the longline sector of the ETBF and, as such, this is the primary focus of the annual report. There was no activity in the Eastern Skipjack Fishery in 2022.

Total catches of WCPFC species of interest reported in logbooks for the ETBF increased from 3,595 t (including <1 t minor line) in 2021 to 3,709 t (including <1 t minor line) in 2022. This is a decline from a peak of 8,229 t in 2002. Longline fishing effort in the ETBF has fallen from a peak of 12.40 million hooks in 2003 to 6.9 million total hooks in 2022. Of this, 6.88 million hooks, 99.7% of effort, was within the Australian exclusive economic zone (EEZ). A further 0.3% of effort occurred in high seas areas adjacent to the Australian EEZ. Thirty-six Australian vessels reported longlining in the WCPFC Convention Area during 2022.

The ETBF is a multi-species longline fishery, targeting albacore, bigeye tuna, yellowfin tuna and swordfish. The profitability and viability of the fishery is dependent on this suite of species, each of which fluctuate in availability in the Australian region through time. Longline logbook catch of albacore decreased from 1,041 t in 2021 to 993 t in 2022. Longline catch of bigeye tuna decreased from 361 t in 2021 to 329 t in 2022. Longline catch of yellowfin tuna decreased from 1,407 t in 2021 to 1,405 t in 2022. Longline catch of swordfish increased from 604 t in 2021 to 719 t in 2022. Longline catch of striped marlin increased from 167 t in 2021 to 230 t in 2022. Longline catch of skipjack increased from 2 t in 2021 to 15 t in 2022.

There were four dedicated minor line (including trolling and rod-and-reel) vessels in the ETBF; most minor line catches are reported by vessels (e.g. longline vessels) on their way to and from fishing grounds. In 2022, five vessels actively targeted tuna and billfish species using minor line in the ETBF, including one vessel which employed both longline and handline. The number of vessels reporting using minor line has decreased in the ETBF from a peak of 52 vessels in 2001. There were no vessels active in the Eastern Skipjack Fishery (purse seine) in 2022.

The Australian Fisheries Management Authority (AFMA) observer program began deploying observers on domestic longliners in 2001, initially as part of a program to test the efficacy of seabird mitigation devices. From July 2003, observers were deployed more broadly across the fishery with the aim of collecting additional fishery data, including information on fishing gear and the size and species composition of catches. AFMA conducted a trial of electronic monitoring (i.e. e-monitoring; on-board, fixed-mount digital video cameras and other systems) in 2009–10 to evaluate the effectiveness of this technology for a range of fishery monitoring purposes and to conduct a cost–benefit analysis. E-monitoring of the fishery became compulsory from 1 July 2015 for vessels operating within the Australian Exclusive Economic Zone. As a minimum, 10% of the hauls are reviewed and used to acquit information provided in logbooks. The total number of longline hooks observed from the e-monitoring system in 2022 was 649,126, which is 9.4% of the hooks deployed.

The AFMA Commission agreed on the total allowable commercial catches (TACCs) for the ETBF. These apply to the 2022 season which commenced on 1 January 2022. The TACCs for the five main target species are: albacore (2,500 t); bigeye tuna (1,056 t); swordfish (1,047 t); striped marlin (351 t); and yellowfin tuna (2,400 t).

# 1 Background

Australian commercial fisheries for highly migratory species in the Western and Central Pacific Fisheries Commission (WCPFC) Convention Area are managed as part of the Eastern Tuna and Billfish Fishery (ETBF) (a mainly longline fishery with a small minor line component) and Eastern Skipjack Fishery (a purse seine fishery). Scientific and common names of relevant species are provided in Appendix A.

## 1.1 Longline

Japanese longliners began fishing off Australia's east coast in the late 1950s. Sporadic domestic longlining for yellowfin tuna commenced soon after, in the early 1960s. The declaration of the Australian Fishing Zone (AFZ) in 1979 resulted in Japanese longliners being licensed to fish in Australian waters under bilateral agreements. In the early 1980s, longlining increased markedly after successful air-freighting of fresh-chilled tuna to Japan. In the 1990s, effort expanded in the waters off northern Queensland, resulting in high catch rates of yellowfin and bigeye tuna.

In the mid-1990s, improved access to swordfish markets in the United States of America prompted many ETBF fishers to move to southern Queensland ports such as Mooloolaba to target swordfish. Japanese longliners were excluded from the AFZ from 1997. Longlining for swordfish has declined since early 2005 because of high fuel and bait costs, the introduction of a competitive total allowable catch (TAC) in 2006 (now an individual transferable quota system), and changes in the currency exchange rate.

The Securing our Fishing Future structural adjustment package (between 2005 and 2006) likely increased the exit of less-efficient vessels from the fishery. However, the number of longline vessels was already declining from a peak of 152 vessels in 1999; by 2007, 58 longline vessels remained, and in 2022 a total of 36 longline vessels were active.

Management through total allowable commercial catch (TACC) limits and individual transferable quotas (ITQs) commenced in 2011. Quota species are albacore, bigeye tuna, yellowfin tuna, swordfish and striped marlin. The level of latency in the ETBF, measured by the proportion of TACC not caught in the fishery, has varied across the key species since the shift to quota-based management in 2011. This is to be expected in a multi-species fishery, noting that latency is driven by a range of factors including catch-per-unit-effort, input costs, fish price and market access.

## 1.2 Pole-and-line, purse seine and minor line

The pole-and-line fishery expanded rapidly in the 1950s with the introduction of live-bait-and-pole techniques for southern bluefin tuna and sporadic catches of skipjack and yellowfin tuna. Pole-and-line fishing decreased in the late-1990s with little to no fishing by Australian fleets in the WCPFC Convention Area since then. The introduction of purse seining in the 1970s also increased catches. After peaking at 7,000 t in the early 1990s, purse-seine effort and catches of skipjack have decreased dramatically, with zero to very low effort and catches in recent years, although there is industry interest in re-invigorating the fishery. Minor line effort has been decreasing in the fishery over time, with a peak number of vessels in 2001 (52). There were four dedicated minor line vessels that operated in the ETBF in 2022.

## 1.3 Recreational fishing

Recreational and charter anglers have taken tuna and billfish off eastern Australia since the early 1900s. During the 1970s, recreational vessels capable of operating offshore became more readily available and angling for tuna and billfish grew in popularity. The continental shelf extends less than 8 natuical miles (nm) offshore in some places along the southeast coast of Australia, allowing anglers to fish for tuna from shore at several locations. The Game Fishing Association of Australia (GFAA) was formed in 1938 and has a membership of several thousand anglers, most based on the east coast of Australia. Many gamefishers tag and release much of their catch, especially marlins.

# 2 Flag state reporting

## 2.1 Domestic longlining catch and effort

Unless otherwise stated, all catch and effort levels in this report are derived from those reported in AFMA logbooks. Thirty-six vessels in the Australian fleet reported longlining in the WCPFC Convention Area during 2022, down from a peak of 180 in 1997 (Figure 1). Total longline effort decreased from 7.68 million hooks in 2021 to 6.9 million hooks in 2022 (Table 1). Overall, effort has declined from the peak effort of 12.40 million hooks deployed in 2003. This decline is mainly the result of the strength of the Australian dollar, increased operating costs, the surrender of permits under the structural adjustment component of the Australian Government Securing Our Fishing Future package, the introduction of hook limits in 2009 and the introduction of individual transferrable quota management in 2011. The number of vessels in 2022 fishing for striped marlin south of 15°S was 31. Thirty-six vessels fished for albacore and 33 fished for swordfish south of 20°S.

**Figure 1. Historical annual vessel numbers for the Australian fleet, by gear (longline, purse seine, pole-and-line and other commercial methods [minor line including trolling, rod-and-reel and handline]) for the WCPFC Convention Area**

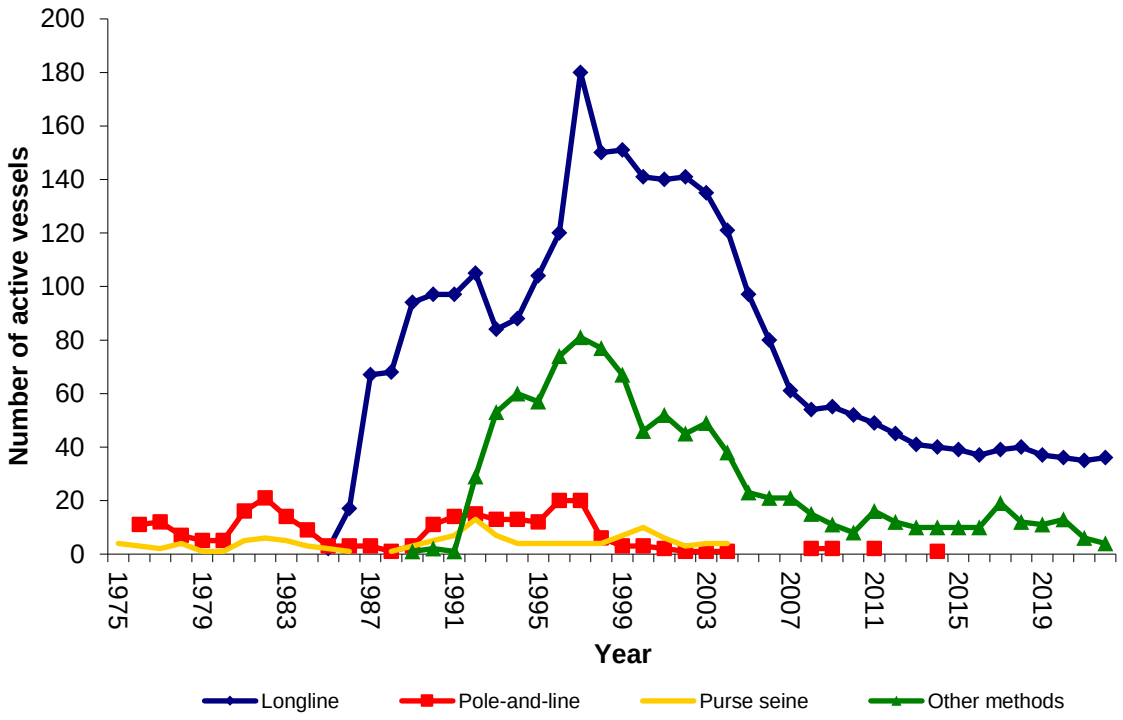


**Table 1. Annual catch and effort estimates (whole weight) for the Australian fleet, by gear and primary species, for the WCPFC Convention Area, 2018–22**

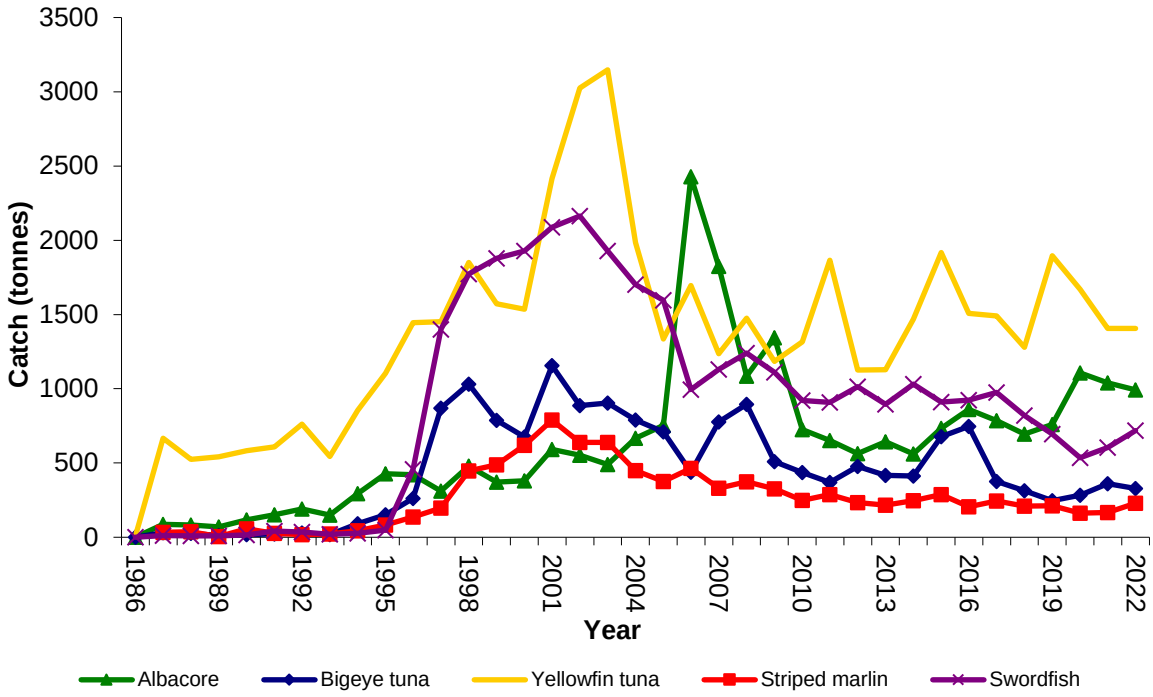
| Fishing method | Year | Effort [a] | Primary species (t) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Albacore | Bigeye | Skipjack | Yellowfin | Striped marlin | Swordfish |
| **Total** | 2018 | - | 694.6 | 313.8 | 3.1 | 1278.2 | 208.9 | 819.9 |
| | 2019 | - | 759.9 | 246.6 | 4.1 | 1896.4 | 211.5 | 694.8 |
| | 2020 | - | 1106.9 | 283.0 | 2.5 | 1670.3 | 162.5 | 536.3 |
| | 2021 | - | 1040.4 | 361.0 | 2.3 | 1406.7 | 166.6 | 604.4 |
| | 2022 | - | 993.4 | 328.8 | 14.7 | 1405.4 | 230.1 | 719.3 |
| **Longline [b]** | 2018 | 7896 | 694.6 | 313.8 | 3.1 | 1278.2 | 208.9 | 819.7 |
| | 2019 | 8567 | 759.9 | 246.6 | 4.0 | 1896.4 | 211.5 | 694.8 |
| | 2020 | 8218 | 1105.4 | 283.0 | 2.5 | 1670.5 | 162.7 | 536.3 |
| | 2021 | 7685 | 1040.9 | 361.0 | 2.3 | 1406.8 | 166.6 | 604.4 |
| | 2022 | 6897 | 993.1 | 328.8 | 14.7 | 1405.4 | 230.1 | 719.3 |
| **Purse seine** | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2019 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2020 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2021 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2022 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Note: **a** Longline–number of hooks (000's); purse seine–search hours. **b** Includes small catches from other commercial methods (minor line component including trolling, rod-and-reel, handline and pole-and-line). Note: Australia is currently reviewing catch estimation methods and therefore values reported here may be amended in future reports.

Total longline catches of WCPFC species of interest in the ETBF reported in logbooks increased from 3,595 t in 2021 to 3,709 t in 2022. This is down from a peak of 8,229 t in 2002. Historical catches for the Australian fleet in the WCPFC Convention Area, by primary species, are shown in Figure 2. Longline catches of albacore decreased from 1,041 t in 2021 to 993 t in 2022 (840 t caught south of 20°S). Longline catches of bigeye tuna decreased from 361 t in 2021 to 329 t in 2022. Longline catches of yellowfin tuna decreased from 1,407 t in 2021 to 1,405 t in 2022. Longline catches of swordfish increased from 604 t in 2021 to 719 t in 2022 (680 t caught south of 20°S). Longline catch of striped marlin increased from 167 t in 2021 to 230 t in 2022 (222 t caught south of 15°S in 2022). Longline catches of skipjack decreased from 2 t in 2021 to 15 t in 2022. Annual catch distributions of the main target species by the Australian longline fleet for 2017 to 2022 are shown in Figure 3.

**Figure 2. Historical annual longline catch in the WCPFC Convention Area for (a) albacore, bigeye tuna and yellowfin tuna, as well as striped marlin and swordfish, and (b) purse seine catch skipjack tuna**

a)

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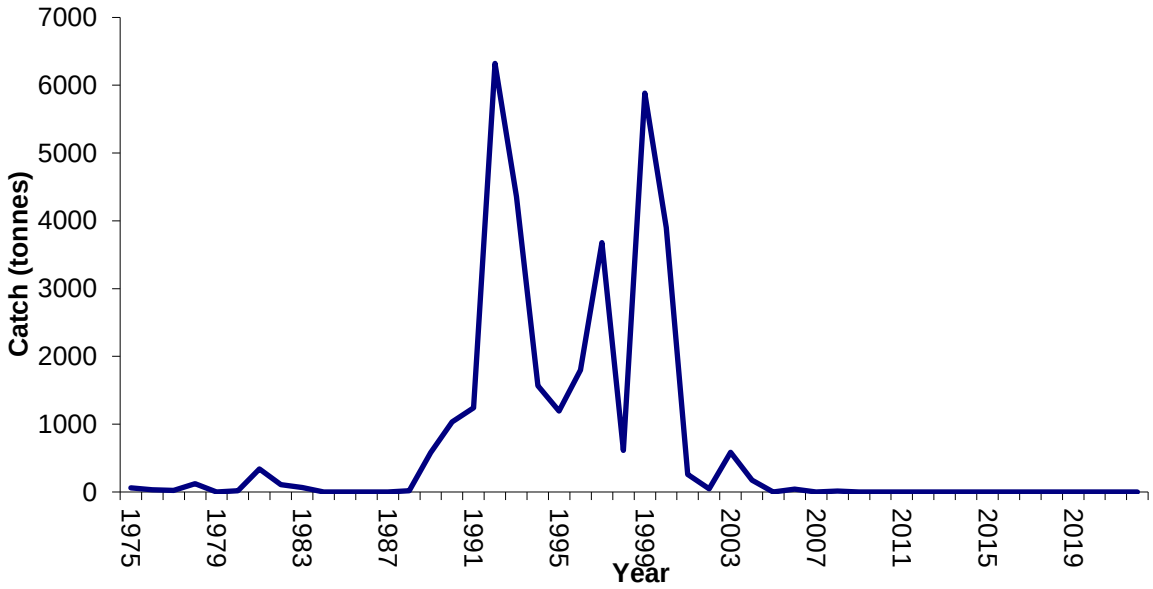
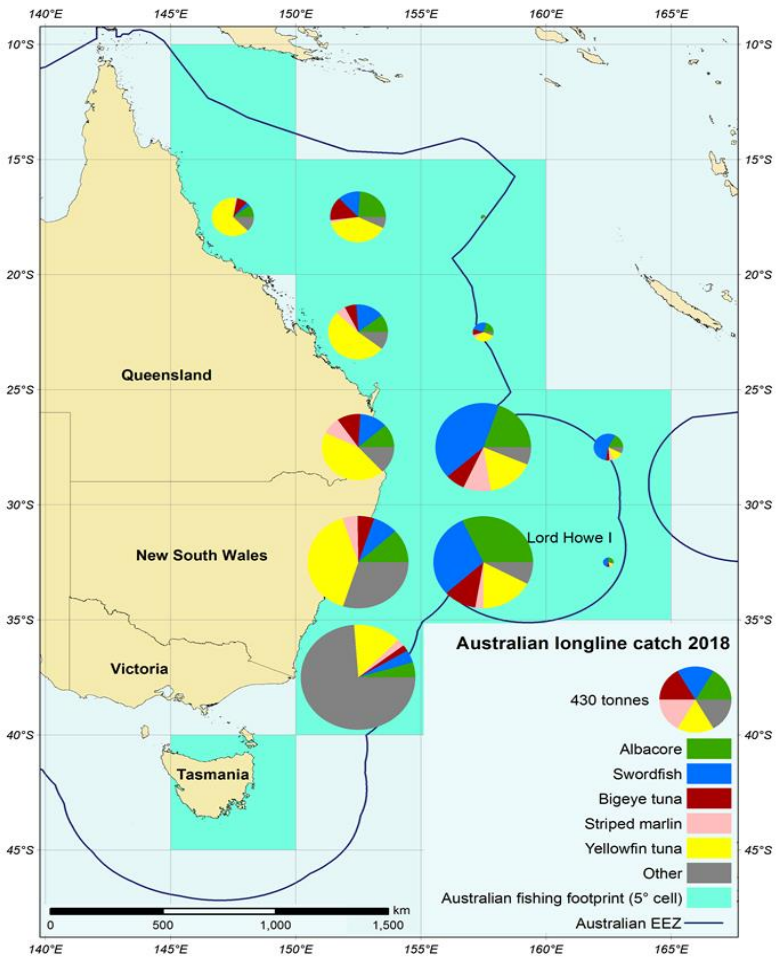


**Figure 3 (a–e). Annual distributions of target species catch by the Australian longline fleet active in the WCPFC Convention Area, for 2018 to 2022. Catches have been aggregated to 5-degree blocks to address issues of confidentiality. The diameter of the pie chart in each grid cell is proportional to the total catch of that grid cell. The diameter to catch relationship is provided in the legend. The pie charts also show the proportions of catch of each of the target species. The segments of the pie chart in the legend are for illustrative purposes only. Fishing footprint shows the total extent of waters fished at a spatial resolution of 5-degree square.**

a)

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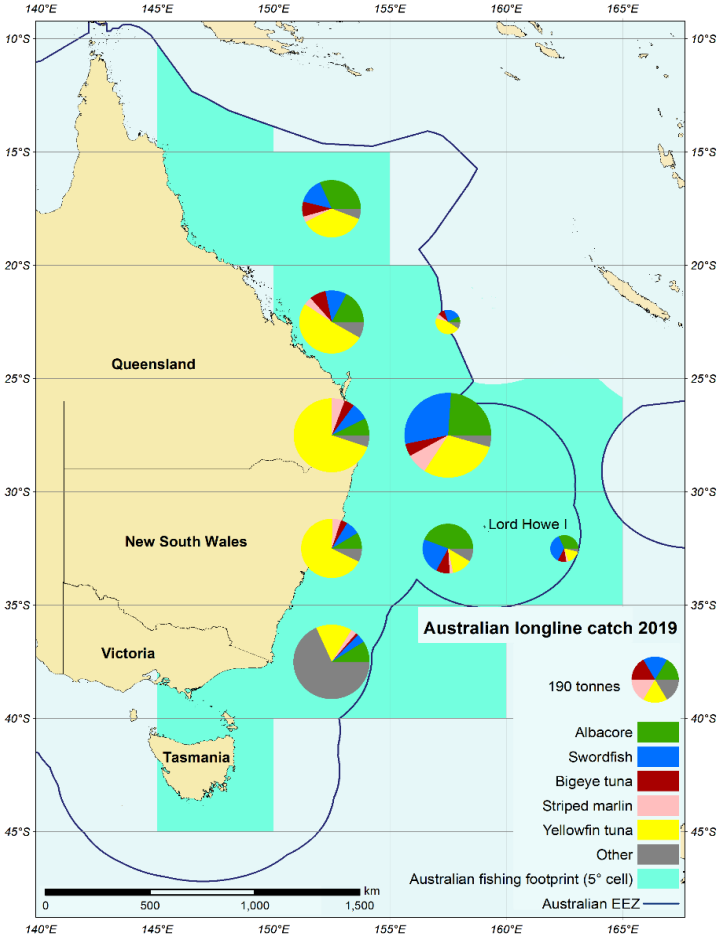

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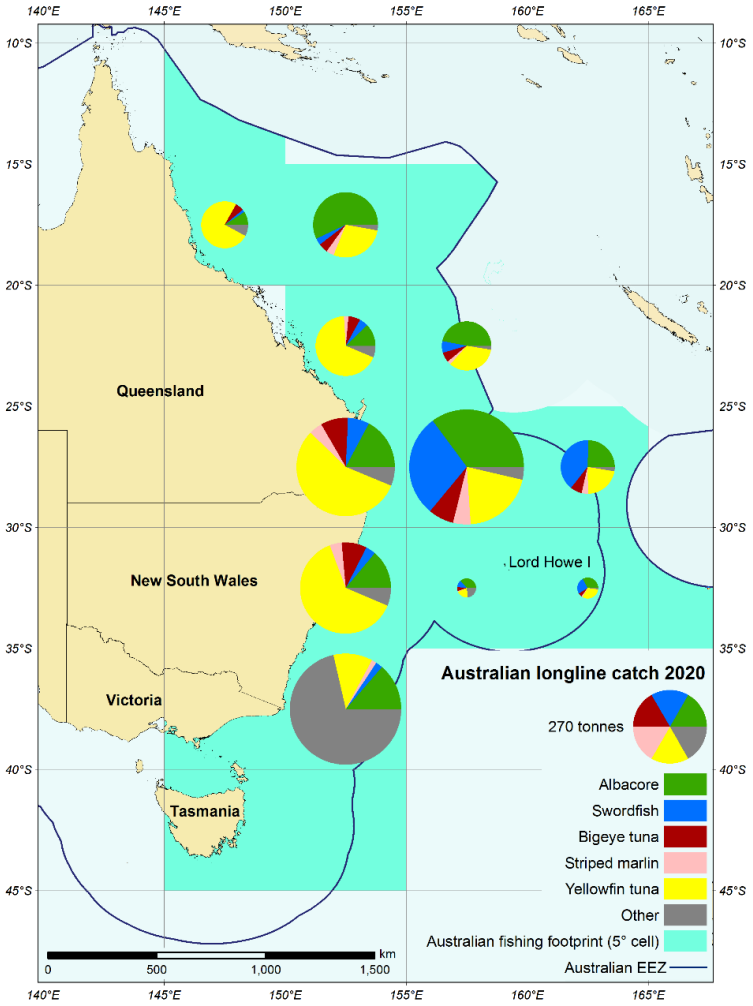
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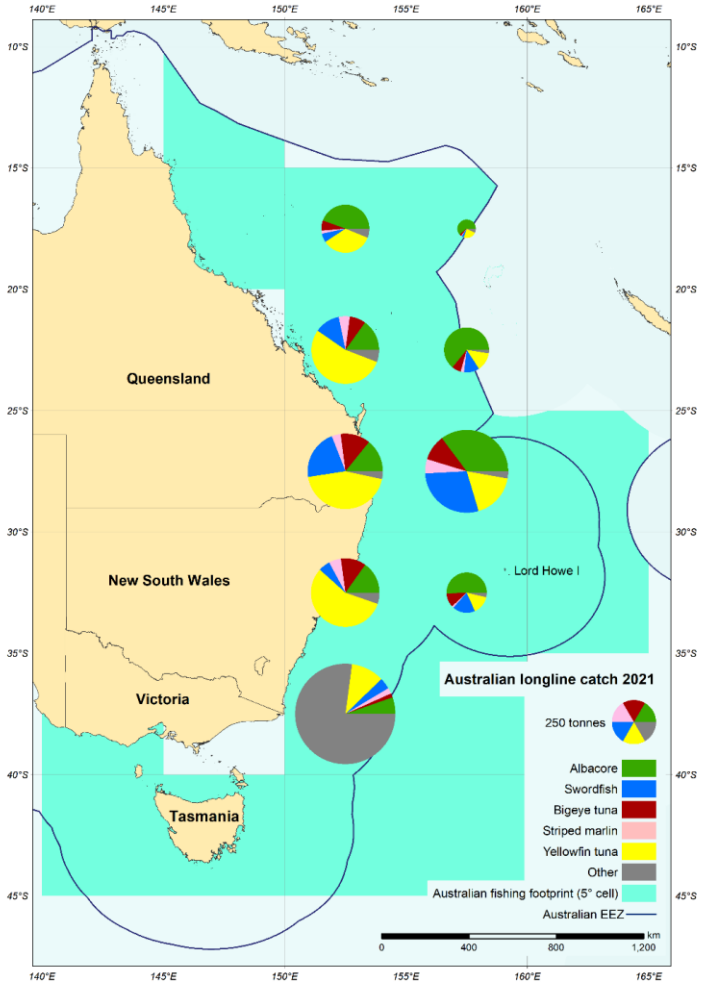
145°E
150°E
155°E
160°E
165°E
10°S
15°S
20°S
25°S
30°S
35°S
40°S
45°S
Queensland
New South Wales
Victoria
Tasmania
Lord Howe I
Australian longline catch 2020
270 tonnes
Albacore
Swordfish
Bigeye tuna
Striped marlin
Yellowfin tuna
Other
Australian fishing footprint (5° cell)
Australian EEZ
km
0
500
1,000
1,500

d)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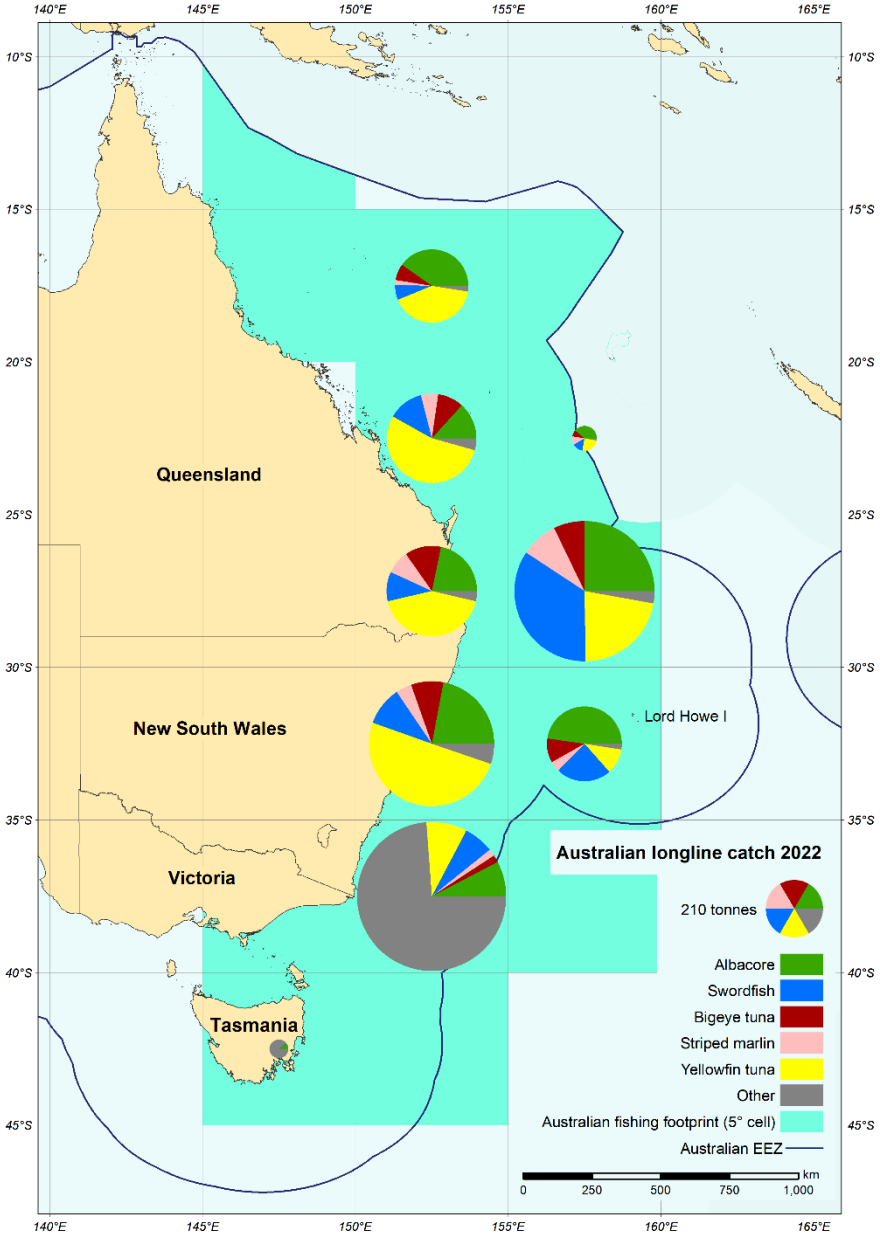
35°S
40°S
45°S
Queensland
New South Wales
Victoria
Tasmania
Lord Howe I
Australian longline catch 2021
250 tonnes
Albacore
Swordfish
Bigeye tuna
Striped marlin
Yellowfin tuna
Other
Australian fishing footprint (5° cell)
Australian EEZ
km
0
400
800
1,200

e)




Annual retained catch estimates of major non-target, associated and dependent species, including sharks, by the Australian longline fleet from 2018–22 are presented in Table 2. Estimates of releases derived from logbooks are in Table 3. From July of 2015, the logbooks of the Australian longline fleet were subject to potential verification through e-monitoring coverage. This has resulted in a rise in the levels of discards reported in logbooks since 2016 (Table 3).

Since 1 January 2013, retention of oceanic whitetip sharks by all commercial vessels has been prohibited and no retention was recorded in logbooks in 2022 (Table 2) while 741 were reported as discarded in logbooks (Table 3). Of the 44 oceanic whitetips observed caught, 8 were released alive, 4 were dead, and 32 were released in an undetermined condition.

Since 1 July 2014, retention of silky sharks has been prohibited. None were recorded as either retained (Table 2) or discarded (Table 3) in logbooks in 2022. In the 2022 calendar year, no silky sharks were observed caught in the ETBF.

Since 14 September 2014 hammerhead sharks must be reported by species under CITES listings. For the purposes of this report, however, we have continued to group hammerheads into a single group for consistency in data presentation.

Further restrictions on shark catches in the ETBF can be found at Management booklets | Australian Fisheries Management Authority (afma.gov.au).

Retention of both blue marlin and black marlin by commercial longliners has been prohibited since 1998 and no retention was recorded in logbooks in 2022, while 579 black marlin and 1,558 blue marlin were reported as discarded (Table 3). The vast majority of the catch and effort by Australian longliners has been within the AFZ, with little effort on the adjacent high seas (Table 4).

## 2.2 Pole-and-line, purse seine and minor line catch and effort

In 2022, there were no active purse-seine vessels in the Eastern Skipjack Fishery and no interactions with whale sharks were recorded (CMM 2019-04). Total minor line catches of WCPFC species of interest in the ETBF (including pole and line, trolling, rod-and-reel and handline) was <1 t in 2022. The only catch of target species was albacore (0.37 t). The number of vessels reporting using minor line in the ETBF has steadily decreased from a peak of 52 vessels in 2001 to five in 2022 (using troll, rod-and-reel and handline). Minor line effort peaked in 2007 with 975 lines.

**Table 2. Annual retained catch estimates (tonnes, t) of major non-target, associated and dependent species, including sharks, by the Australian fleet, by gear (longliners and other methods combined), in the WCPFC Convention Area, for 2018–22**

| Group | Species | Longline (t) | | | | | Other methods (t) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2018 | 2019 | 2020 | 2021 | 2022 | 2018 | 2019 | 2020 | 2021 | 2022 |
| Scalefish | Escolar | 23.8 | 26.5 | 7.7 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Lancetfish | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Mahi mahi | 128.1 | 119.3 | 81.3 | 53.3 | 35.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Moonfish | 14 | 12.3 | 25.5 | 33.4 | 8.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Ocean sunfish | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Oilfish | 0.1 | 0.6 | 2.2 | 0.6 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Ray's bream | 22.4 | 19.3 | 15.5 | 8.2 | 11.6 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| | Rudderfish | 43.9 | 19.4 | 8.4 | 10.6 | 15.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Sailfish | 1.6 | 2.4 | 1.3 | 1.7 | 1.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Shortbill spearfish | 11.8 | 16.9 | 10.4 | 4.5 | 5.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Wahoo | 14.9 | 14.7 | 13.3 | 12.7 | 11.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | **Subtotal** | **260.6** | **231.4** | **165.9** | **125.2** | **90.2** | **0.0** | **0.0** | **0.1** | **0.0** | **0.0** |
| Sharks | Blacktip shark | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Blue shark | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Bronze whaler | 0.4 | 0.5 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Dusky shark | 0.3 | 0.2 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Hammerhead | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Longfin mako | 0.2 | 0.2 | 0.1 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Oceanic whitetip | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Porbeagle | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Shortfin mako | 24.9 | 23.7 | 16 | 12.5 | 14.9 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 |
| | Silky shark | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Thresher shark | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Tiger shark | 0.1 | 0.1 | 0.1 | 0.0 | 1.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Whale shark | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | **Subtotal** | **26** | **24.8** | **16.8** | **12.5** | **16.7** | **0.2** | **0.0** | **0.0** | **0.2** | **0.0** |
| | **TOTAL** | **286.6** | **256.2** | **182.7** | **137.7** | **106.9** | **0.2** | **0.0** | **0.1** | **0.2** | **0.0** |

**Table 3. Annual longline discard estimates (numbers) of major non-target, associated and dependent species, including sharks, by the Australian fleet in the WCPFC Convention Area, for 2018–22**

| Group | Species | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|
| Scalefish | Black marlin | 1,333 | 1,506 | 1,310 | 1,489 | 579 |
| | Blue marlin | 1,038 | 984 | 681 | 1,230 | 1,558 |
| | Escolar | 1,192 | 1,636 | 2,041 | 567 | 585 |
| | Lancetfish | 17,295 | 21,421 | 19,346 | 21,369 | 15,466 |
| | Mahi mahi | 864 | 703 | 404 | 569 | 400 |
| | Moonfish | 7 | 5 | 82 | 27 | 235 |
| | Ocean sunfish | 2,834 | 1,379 | 2,149 | 5,846 | 4,154 |
| | Oilfish | 41 | 54 | 258 | 752 | 1,258 |
| | Ray's bream | 201 | 115 | 181 | 68 | 229 |
| | Rudderfish | 1,767 | 3,845 | 4,349 | 3,926 | 5,043 |
| | Sailfish | 24 | 74 | 38 | 73 | 19 |
| | Shortbill spearfish | 115 | 171 | 131 | 101 | 209 |
| | Wahoo | 55 | 68 | 47 | 88 | 57 |
| | **Subtotal** | **26,766** | **31,961** | **31,017** | **36,105** | **29,792** |
| Sharks | Blacktip sharks | 0 | 6 | 0 | 0 | 0 |
| | Blue shark | 13,820 | 13,394 | 14,871 | 21,134 | 20,141 |
| | Bronze whaler | 3477 | 4568 | 2331 | 11,403 | 3,628 |
| | Dusky shark | 1648 | 2339 | 1470 | 333 | 211 |
| | Hammerhead | 476 | 433 | 287 | 376 | 138 |
| | Longfin mako | 6 | 1 | 3 | 0 | 0 |
| | Oceanic whitetip | 806 | 1071 | 1086 | 1637 | 741 |
| | Porbeagle | 4 | 1 | 1 | 0 | 0 |
| | Shortfin mako | 1311 | 1219 | 805 | 1,079 | 501 |
| | Silky shark | 130 | 54 | 264 | 60 | 0 |
| | Thresher shark | 664 | 634 | 970 | 868 | 619 |
| | Tiger shark | 749 | 682 | 1621 | 1,684 | 1,156 |
| | Whale shark | 0 | 0 | 0 | 0 | 0 |
| | **Subtotal** | **23,091** | **24,402** | **23,709** | **38,574** | **27,135** |
| | **TOTAL** | **49,857** | **56,363** | **54,726** | **74,679** | **56,927** |

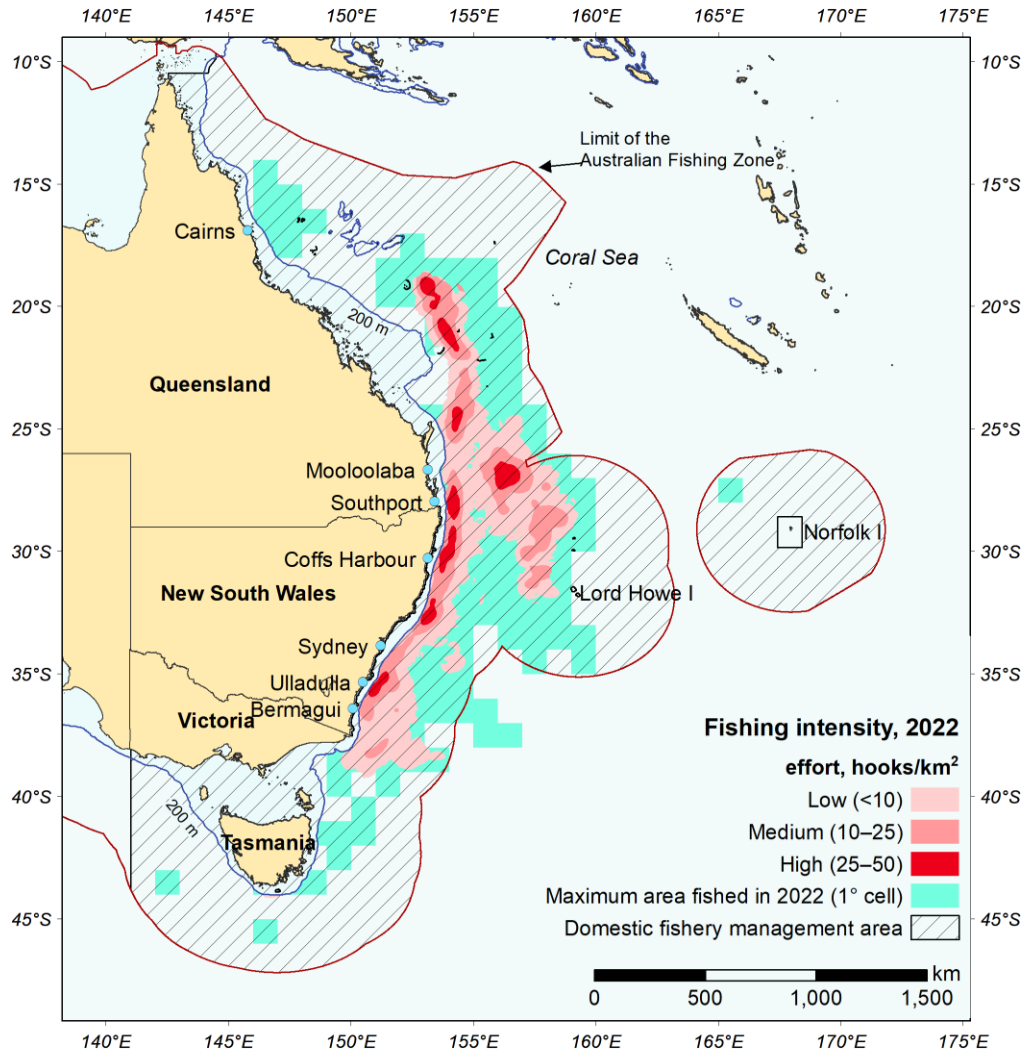
**Table 4. Effort by Australian longliners and catch by primary species, within the AFZ and on the high seas, 2018–22. The percentage of catch or effort within the AFZ or on the high seas is provided in parentheses.**

| | Year | Effort ('000 hooks) | Primary species catch (t) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Albacore | Bigeye | Skipjack | Yellowfin | Striped marlin | Swordfish |
| **Within AFZ** | 2018 | 7,783 | 692.6 | 311.2 | 3.1 | 1,273.9 | 202.1 | 804.6 |
| | | (98.6%) | (99.7%) | (99.2%) | (100.0%) | (99.7%) | (96.7%) | (98.2%) |
| | 2019 | 8,539 | 757.6 | 245.9 | 4.0 | 1,893.9 | 210.6 | 690.7 |
| | | (99.7%) | (99.7%) | (99.7%) | (100.0%) | (99.9%) | (99.6%) | (99.4%) |
| | 2020 | 8134 | 1,100.6 | 281.1 | 2.5 | 1,660.9 | 161.2 | 525.0 |
| | | (99.1%) | (99.5%) | (99.3%) | (99.6%) | (99.4%) | (99.2%) | (97.9%) |
| | 2021 | 7,424 | 1,019.4 | 348 | 2.2 | 1,376.8 | 162.8 | 588.6 |
| | | (99.8%) | (99.9%) | (100%) | (100%) | (99.9%) | (100%) | (99.9%) |
| | 2022 | 6,876 | 991.8 | 328.4 | 14.7 | 1,404.4 | 229.6 | 717.2 |
| | | (99.7%) | (99.9%) | (99.9%) | (99.99%) | (99.9%) | (99.8%) | (99.7%) |
| **High seas** | 2018 | 113 | 2.0 | 2.6 | 0 | 4.3 | 6.8 | 15.1 |
| | | (1.4%) | (0.3%) | (0.8%) | (0.0%) | (0.3%) | (3.3%) | (1.8%) |
| | 2019 | 27 | 2.3 | 0.7 | 0 | 2.5 | 0.9 | 4.2 |
| | | (0.3%) | (0.3%) | (0.3%) | (0.0%) | (0.1%) | (0.4%) | (0.6%) |
| | 2020 | 72 | 5.9 | 2 | 0.01 | 9.4 | 1.3 | 11.2 |
| | | (0.9%) | (0.5%) | (0.7%) | (0.4%) | (0.6%) | (0.8%) | (2.1%) |
| | 2021 | 17 | 1 | 0 | 0 | 0.6 | 0 | 0.1 |
| | | (0.2%) | (0.1%) | (0%) | (0%) | (<0.1%) | (0%) | (<0.1%) |
| | 2022 | 20.8 | 1.2 | 0.4 | 0.001 | 1 | 0.5 | 2.1 |
| | | (0.3%) | (0.1%) | (0.1%) | (<0.1%) | (<0.1%) | (0.2%) | (0.3%) |

## 2.3 Fishing patterns

Fishing patterns vary with target species, location and season. The management area of the ETBF extends from Cape York, at the northern tip of Queensland, to the border between Victoria and South Australia, including waters around Tasmania (Figure 4). In the WCPFC Convention Area, skipjack tuna are fished from southern New South Wales to north-eastern Tasmania.

**Figure 4. Longline effort distribution in the Eastern Tuna and Billfish Fishery (2022). Fishing footprint shows the total extent of waters fished at a spatial resolution of one degree square.**




# 2.4 Fleet operations

Domestic longlining vessels are mostly 15–25 m long and use monofilament gear (Table 5). Vessels usually conduct one longline operation per day, or night, depending on the target species. A typical longline set will comprise about 1400+ hooks. Fishers commonly operate around 150 days per year. Most trips are between 2 and 15 days and typically range from 40–300 nm from port with effort mostly concentrated on the edge of the continental shelf (seaward of 200 m depth) but extending much further eastward off Mooloolaba (Figure 4). The catch is gilled and gutted (depending on species) and stored on ice, in ice slurry or in refrigerated brine.

Historically, most purse-seiners were 20–25 m long, but several were 40–45 m. Most poling vessels were 15–20 m long. Most minor line catches are reported by vessels (e.g. longline vessels) on their way to and from fishing grounds.

**Table 5. Number of Australian vessels, by gear and size category, active in the WCPFC Convention Area, targeting WCPFC species, for 2018 to 2022. Gross registered tonnes (GRT) is the unit for vessel size.**

| Year | Longline | | | | Purse seine | Pole-and-line | Troll | Rod-and-reel | Total |
|---|---|---|---|---|---|---|---|---|---|
| Vessel size (GRT) | ≤50 | 51–200 | 201–500 | Subtotal | ≤500 | 0–50 | Unknown | Unknown | |
| 2018 | 16 | 23 | 1 | 40 | 0 | 0 | 0 | 0 | 40 |
| 2019 | 10 | 26 | 1 | 37 | 0 | 0 | 0 | 0 | 37 |
| 2020 | 8 | 27 | 1 | 36 | 0 | 0 | 2 | 0 | 38 |
| 2021 | 9 | 25 | 1 | 35 | 0 | 0 | 2 | 3 | 41[a] |
| 2022 | 8 | 26 | 2 | 36 | 0 | 0 | 1 | 3 | 40 |

**a** The total of forty-one vessels that fished in the WCPFC Convention Area in 2021 include one handline vessel.

# 2.5 Species of special interest

Australia implements a mandatory reporting scheme for fisheries interactions with protected species, which includes species of special interest. Interactions with these species are recorded by fishers in their logbooks and are reported to AFMA. These interactions are then forwarded to the Department of Climate Change, Energy, the Environment and Water on a quarterly basis. A summary of these interactions, from logbooks, is presented in Table 6. Life status of the animal involved in the interaction is also recorded.

In 2022, interactions were recorded with 29 green turtles (all alive), 25 leatherback turtles (24 alive and 1 dead), 13 loggerhead turtles (all alive), 6 Olive Ridley turtles (4 alive and 2 dead), and 25 unidentified turtles (21 alive and 4 dead).

Interactions were also recorded with 10 flesh footed shearwaters (8 alive and 2 dead), 2 short tailed shearwaters (both dead), 24 unspecified shearwaters (1 alive, 22 dead and 1 unknown), 1 shy albatross (dead), 1 wandering albatross (dead), 33 unspecified albatrosses (3 alive, 29 dead and 1 injured), 2 short-finned pilot whales (both alive), 1 long-finned pilot whale (alive), 1 false killer whale (alive), 5 toothed whales (2 alive and 3 dead), 2 common dolphins (both alive), 10 unidentified dolphin (8 alive and 2 dead), 2 Australian fur seals (both alive), 13 unidentified seals (12 alive and 1 dead).

From July of 2015, the logbooks of the Australian longline fleet were subject to potential verification through electronic monitoring. This has resulted in an increase in the reporting level of interactions with species of special interest since 2016 (Table 6).

Observed captures are reported in Table 7. In 2022, there were 13 observed captures of sea turtles (9 alive, 1 dead and 3 of unknown life status); and 10 captures of seabirds (4 alive and 6 dead).

## 2.5.1 Sea turtles

The Eastern Tuna and Billfish Fishery requires the use of large circle hooks in Australia's shallow-set pelagic longline fisheries targeting swordfish, consistent with CMM2018-03. Mitigation requirements in the ETBF for sea turtles are reported in Appendix B.

### 2.5.2 Seabirds and marine mammals

Australia has extensive mitigation requirements for seabirds in the ETBF (Appendix B). More specific seabird interaction information is presented in Table 8 and Table 9. Table 10 provides the proportion of mitigation measures used.

**Table 6. Interactions with species of special interest recorded in logbooks for the Australian longline fleet in the WCPFC Convention Area, 2018–22. Interactions not identified to species level are noted as unspecified (unspec).**

| Group | Common name | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|
| Seabirds | Black-browed albatross | 4 | 2 | 3 | 0 | 0 |
| | Shy albatross | 0 | 1 | 1 | 0 | 1 |
| | Sooty albatross | 0 | 0 | 1 | 0 | 0 |
| | Wandering albatross | 6 | 3 | 0 | 0 | 1 |
| | Albatrosses (unspec) | 56 | 50 | 9 | 20 | 33 |
| | Cape Petrel | 0 | 1 | 0 | 0 | 0 |
| | Sooty shearwater | 1 | 0 | 0 | 0 | 0 |
| | Short-tailed shearwater | 1 | 2 | 0 | 1 | 2 |
| | Flesh-footed shearwater | 0 | 0 | 0 | 16 | 10 |
| | Shearwaters (unspec) | 17 | 37 | 10 | 5 | 24 |
| | Terns | 0 | 0 | 1 | 0 | 0 |
| | Australian gannet | 4 | 0 | 3 | 0 | 0 |
| | Birds (unspec) | 3 | 5 | 14 | 16 | 0 |
| | **Subtotal** | **92** | **101** | **42** | **58** | **71** |
| Turtles | Green turtle | 36 | 52 | 31 | 16 | 29 |
| | Hawksbill turtle | 5 | 8 | 3 | 2 | 0 |
| | Leatherback turtle | 68 | 53 | 21 | 21 | 25 |
| | Loggerhead turtle | 18 | 12 | 13 | 10 | 13 |
| | Flatback turtle | 0 | 1 | 0 | 1 | 0 |
| | Pacific (Olive) Ridley turtle | 7 | 9 | 7 | 5 | 6 |
| | Turtles (unspec) | 22 | 18 | 20 | 35 | 25 |
| | **Subtotal** | **156** | **153** | **95** | **90** | **98** |
| Mammals | Melon-headed whale | 0 | 0 | 2 | 0 | 0 |
| | Toothed whales | 0 | 0 | 0 | 0 | 5 |
| | Short-finned pilot whale | 7 | 4 | 1 | 4 | 2 |
| | Long-finned pilot whale | 1 | 0 | 0 | 2 | 1 |
| | False killer whale | 0 | 4 | 3 | 0 | 1 |
| | Humpback whale | 1 | 0 | 0 | 0 | 0 |
| | Whales (unspec) | 0 | 1 | 3 | 0 | 0 |
| | Common dolphin | 0 | 3 | 2 | 0 | 2 |
| | Bottlenose dolphin | 0 | 1 | 1 | 1 | 0 |
| | Dolphin (unspec) | 4 | 7 | 4 | 1 | 5 |
| | Australian fur seal | 0 | 0 | 0 | 0 | 2 |
| | New Zealand fur seal | 0 | 2 | 0 | 0 | 0 |
| | Seals (unspec) | 5 | 0 | 1 | 11 | 13 |
| | **Subtotal** | **18** | **22** | **17** | **19** | **31** |
| | Unknown or other | **0** | **0** | **0** | **0** | **0** |
| | **TOTAL** | **266** | **276** | **154** | **167** | **200** |

**Table 7. Observed captures of species of special interest for the Australian longline fleet in the WCPFC Convention Area, 2018–22. Interactions not identified to species level are noted as unspecified (unspec).**

| Group | Common name | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|
| Seabirds | Black-browed albatross | 0 | 0 | 0 | 0 | 0 |
| | Shy albatross | 0 | 0 | 0 | 0 | 0 |
| | Wandering albatross | 0 | 1 | 0 | 0 | 0 |
| | Albatrosses (other) | 9 | 3 | 4 | 5 | 1 |
| | Cape petrel | 0 | 0 | 0 | 0 | 0 |
| | Gannets and boobies | 0 | 0 | 3 | 0 | 0 |
| | Great crested tern | 0 | 0 | 0 | 0 | 0 |
| | Flesh-footed shearwater | 0 | 0 | 0 | 0 | 0 |
| | Wilson's storm petrel | 0 | 0 | 0 | 0 | 0 |
| | Petrels Prions and Shearwaters | 4 | 6 | 0 | 1 | 1 |
| | Shearwaters | 0 | 1 | 2 | 3 | 7 |
| | Birds (unspec) | 1 | 0 | 2 | 1 | 1 |
| | **Subtotal** | **14** | **11** | **11** | **10** | **10** |
| Turtles | Green turtle | 0 | 5 | 0 | 0 | 0 |
| | Hawksbill turtle | 0 | 0 | 0 | 0 | 0 |
| | Leatherback turtle | 11 | 2 | 0 | 6 | 3 |
| | Loggerhead turtle | 0 | 0 | 0 | 0 | 0 |
| | Pacific (Olive) Ridley | 0 | 0 | 0 | 0 | 0 |
| | Turtles (unspec) | 14 | 16 | 9 | 11 | 13 |
| | **Subtotal** | **25** | **23** | **9** | **17** | **16** |
| Mammals | Dolphin (unspec) | 1 | 2 | 0 | 0 | 0 |
| | Long-finned pilot whale | 0 | 0 | 0 | 0 | 0 |
| | Short-finned pilot whale | 0 | 1 | 0 | 0 | 0 |
| | Whales (unspec) | 2 | 1 | 1 | 0 | 1 |
| | Eared seals | 0 | 0 | 0 | 0 | 1 |
| | Australian fur seal | 0 | 0 | 0 | 0 | 0 |
| | **Subtotal** | **3** | **4** | **1** | **0** | **2** |
| | **TOTAL** | **42** | **38** | **21** | **27** | **28** |

CMM 2011-03 regarding the intentional setting of purse-seine gear on cetaceans entered into force on 1 January 2013. Such setting practices are prohibited in Australian purse-seine fisheries since the introduction of the *Environment Protection and Biodiversity Conservation Act*. There were no reported interactions with cetaceans in purse-seine fisheries in 2022.

**Table 8. Effort and observed seabird captures by fishing year for the ETBF a) south of 30°S, b) for 25°S – 30°S and c) for 23°N – 25°S. No seabird captures have been observed north of 23°N as there was no effort. For each year, the table gives number of longline vessels, total number of hooks (000's), number of observed hooks (000's), observer coverage (percentage of hooks that were observed), number of observed captures and the capture rate (captures per thousand hooks). Mitigation methods provided in Appendix B.**

a) South of 30°S

| Year | | Fishing effort (000's hooks) | | | Observed seabird captures | |
|---|---|---|---|---|---|---|
| | Number of vessels | Number of hooks | Observed hooks | % hooks observed | Capture number | Capture rate |
| 2016 | 31 | 2,471 | 278 | 11.2 | 2 | 0.007 |
| 2017 | 32 | 2,183 | 206 | 9.4 | 2 | 0.010 |
| 2018 | 37 | 3,084 | 345 | 11.2 | 8 | 0.023 |
| 2019 | 33 | 2,537 | 306 | 12.1 | 8 | 0.026 |
| 2020 | 30 | 1,721 | 168 | 9.8 | 9 | 0.054 |
| 2021 | 30 | 1,890 | 187 | 9.9 | 7 | 0.037 |
| 2022 | 31 | 2,071 | 201 | 9.7 | 3 | 0.015 |

b) 25°S – 30°S

| Year | Fishing effort (000's hooks) | | | | Observed seabird captures | |
|---|---|---|---|---|---|---|
| | Number of vessels | Number of hooks | Observed hooks | % hooks observed | Capture number | Capture rate |
| 2016 | 26 | 3,718 | 326 | 8.8 | 1 | 0.003 |
| 2017 | 31 | 3,816 | 391 | 10.3 | 0 | 0.000 |
| 2018 | 27 | 2,917 | 298 | 10.2 | 5 | 0.017 |
| 2019 | 26 | 3,264 | 391 | 12.0 | 3 | 0.008 |
| 2020 | 22 | 3,990 | 409 | 10.2 | 2 | 0.005 |
| 2021 | 21 | 2,607 | 267 | 10.2 | 1 | 0.004 |
| 2022 | 22 | 2,583 | 240 | 9.3 | 6 | 0.025 |

c) 23°N – 25°S

| Year | Fishing effort (000's hooks) | | | | Observed seabird captures | |
|---|---|---|---|---|---|---|
| | Number of vessels | Number of hooks | Observed hooks | % hooks observed | Capture number | Capture rate |
| 2016 | 20 | 1,633 | 131 | 8.0 | 0 | 0.000 |
| 2017 | 22 | 2,744 | 300 | 10.9 | 0 | 0.000 |
| 2018 | 22 | 1,897 | 212 | 11.2 | 1 | 0.005 |
| 2019 | 18 | 2,769 | 302 | 10.9 | 0 | 0.000 |
| 2020 | 18 | 2,409 | 219 | 9.8 | 0 | 0.000 |
| 2021 | 17 | 3,025 | 288 | 9.5 | 2 | 0.007 |
| 2022 | 21 | 2,062 | 207 | 10.0 | 1 | 0.005 |

**Table 9. Number of observed seabird captures in the ETBF, 2022, by species and area**

| Species | South of 30°S | 25°S–30°S | 23°N–25°S | North of 23°N | Total Captures |
|---|---|---|---|---|---|
| Birds | 0 | 0 | 1 | 0 | 1 |
| Albatrosses | 1 | 0 | 0 | 0 | 1 |
| Gannets and boobies | 0 | 0 | 0 | 0 | 0 |
| Petrels and Shearwaters | 1 | 0 | 0 | 0 | 1 |
| Shearwaters | 1 | 6 | 0 | 0 | 7 |
| **Total** | **3** | **6** | **1** | **0** | **10** |

**Table 10. Proportion of mitigation types used by the fleet 2018 to 2022**

| **Combination of mitigation measures** | **Proportion of observed effort using mitigation measures** | | | | |
|---|---|---|---|---|---|
| | **2018** | **2019** | **2020** | **2021** | **2022** |
| TL + WB | 0.86 | 0.85 | 0.90 | 0.87 | 0.86 |
| TL + WB + NS | 0.14 | 0.15 | 0.10 | 0.13 | 0.14 |
| **Total** | **1.00** | **1.00** | **1.00** | **1.00** | **1.00** |

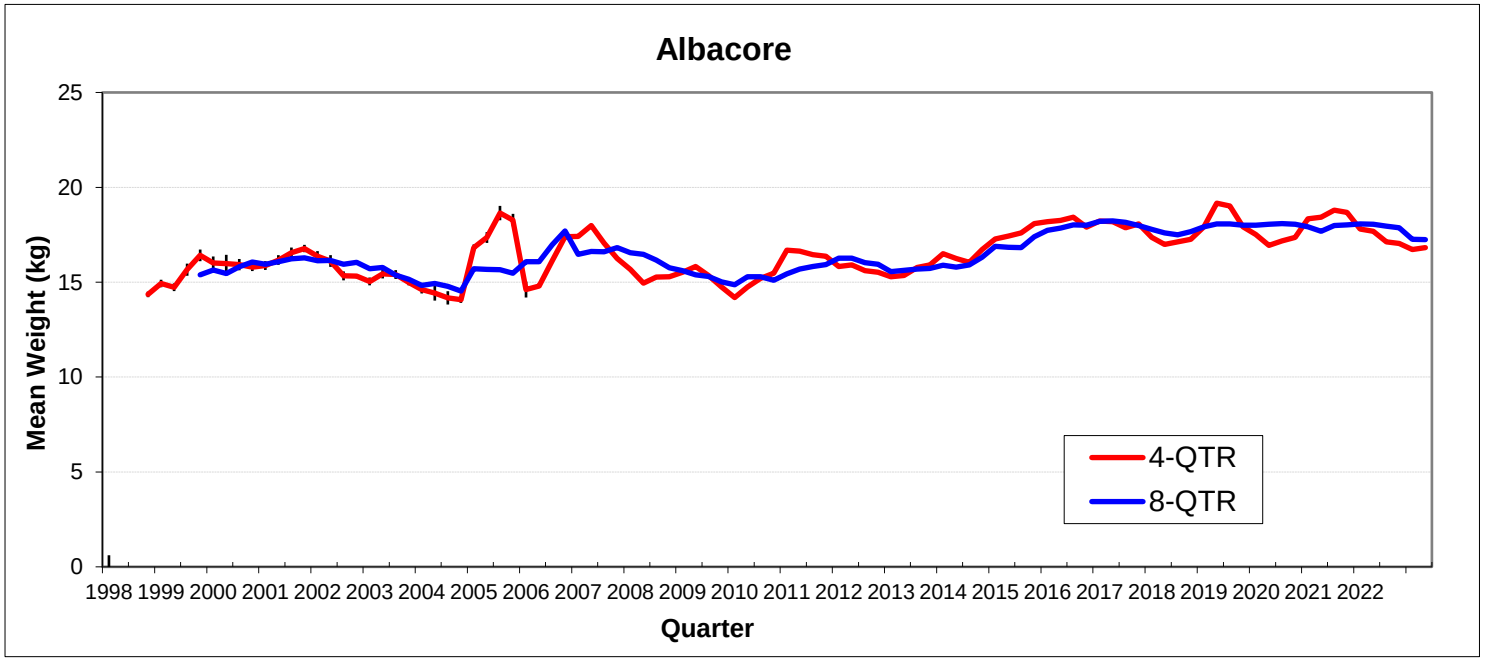
Note: Proportions were derived from the AFMA observer database and, from July 2015 onwards, from electronic monitoring data. TL = tori line, NS = Night setting, WB = weighted branch lines.

## 2.6 Trends in size composition of retained catch

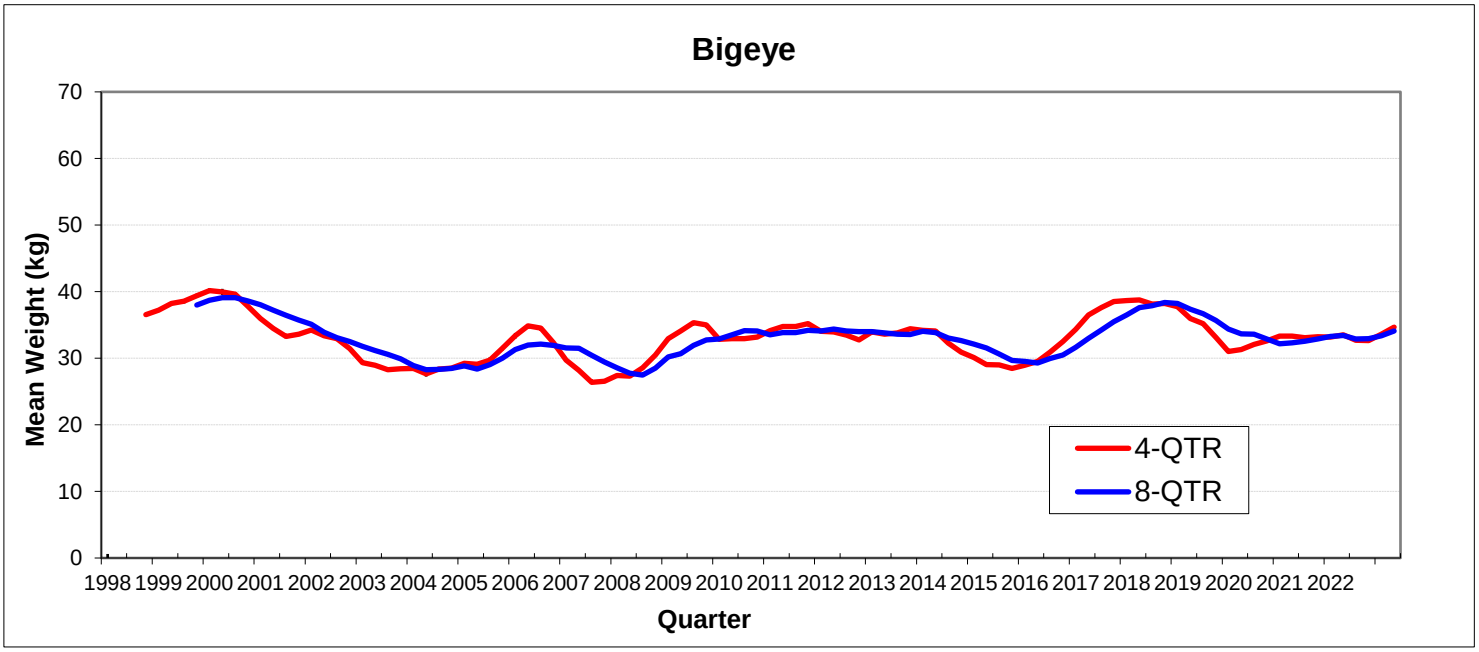
The size composition (based on processed weights) of albacore, bigeye tuna, yellowfin tuna and striped marlin is shown in Figure 5. Albacore has maintained a high 8-quarter running mean weight of around 18 kg since 2016 (Figure 5a). The 8-quarter running mean of bigeye tuna declined to around 32–35 kg by the end of 2019 and has since remained fairly stable (Figure 5b). Yellowfun tuna maintained a high 8-quarter running mean weight of 39–40kg between 2016 to 2018 before decreasing to ~35kg from 2019 to 2022 (Figure 5c). The 8-quarter running mean weight of striped marlin hovered around 63 kg from 2018 to 2020 before decreasing to 60 kg in 2022 (Figure 5d). Swordfish showed an increasing trend in its 8-quarter running mean between 2015 to 2018 before declining to around 41 kg by the end of 2022 (Figure 5e).

**Figure 5 (a–e). Time series of 4-quarter and 8-quarter running means from 1998 to 2022, by quarter, of processed fish weight (in kg) of a) albacore, b) bigeye tuna, c) yellowfin tuna, d) striped marlin and e) swordfish sampled across the entire ETBF based on the data collected from the port sampling program.**

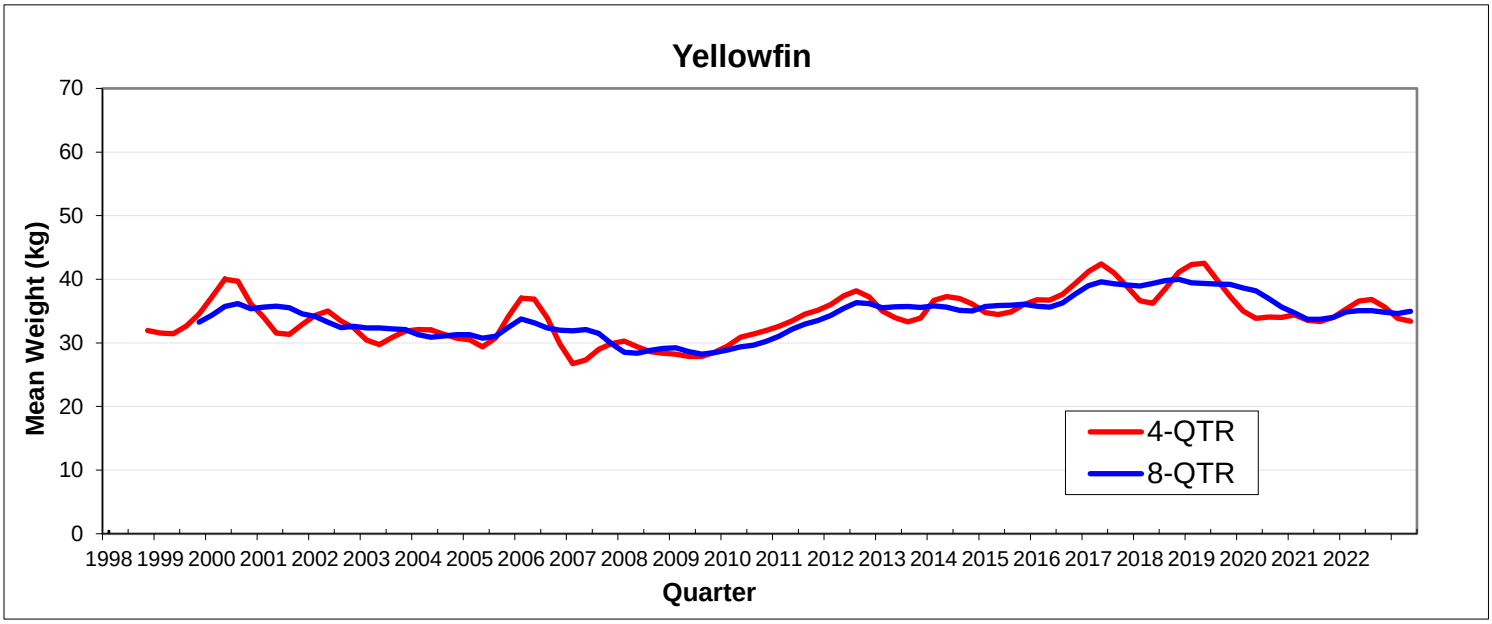
a)



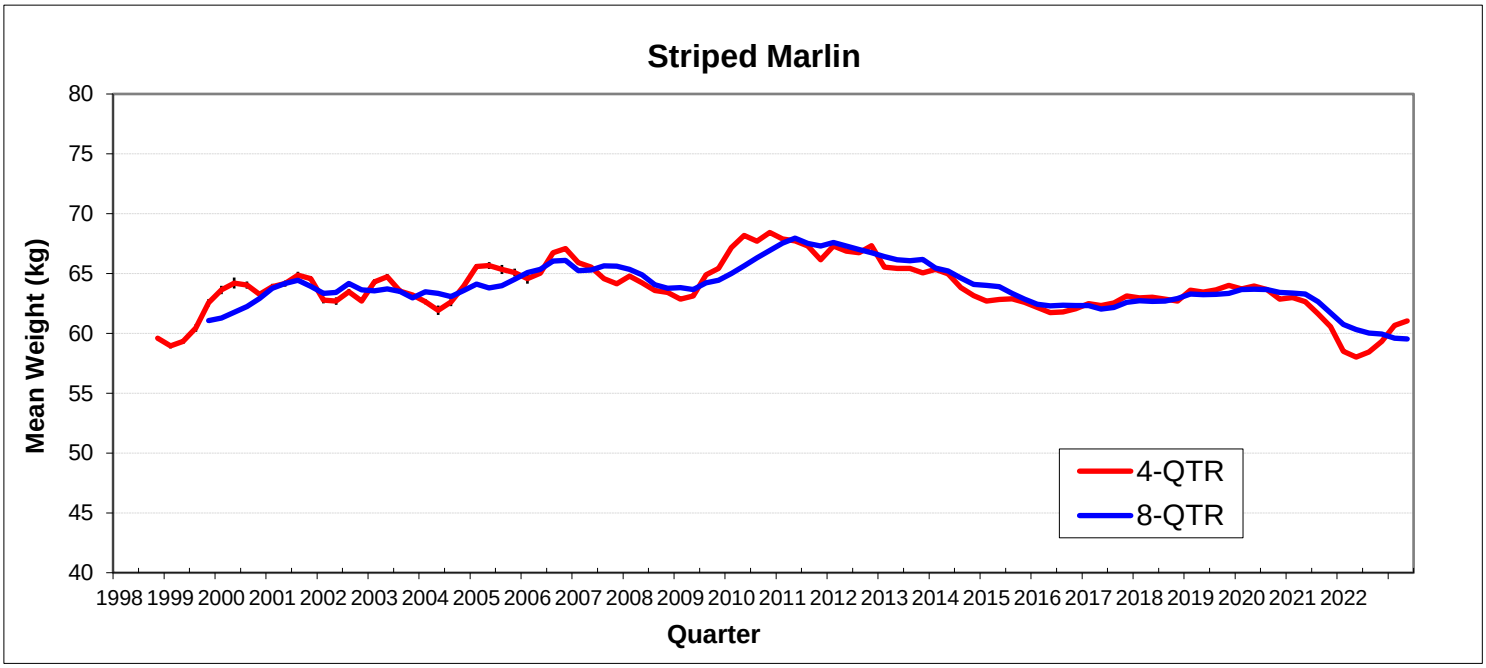

b)



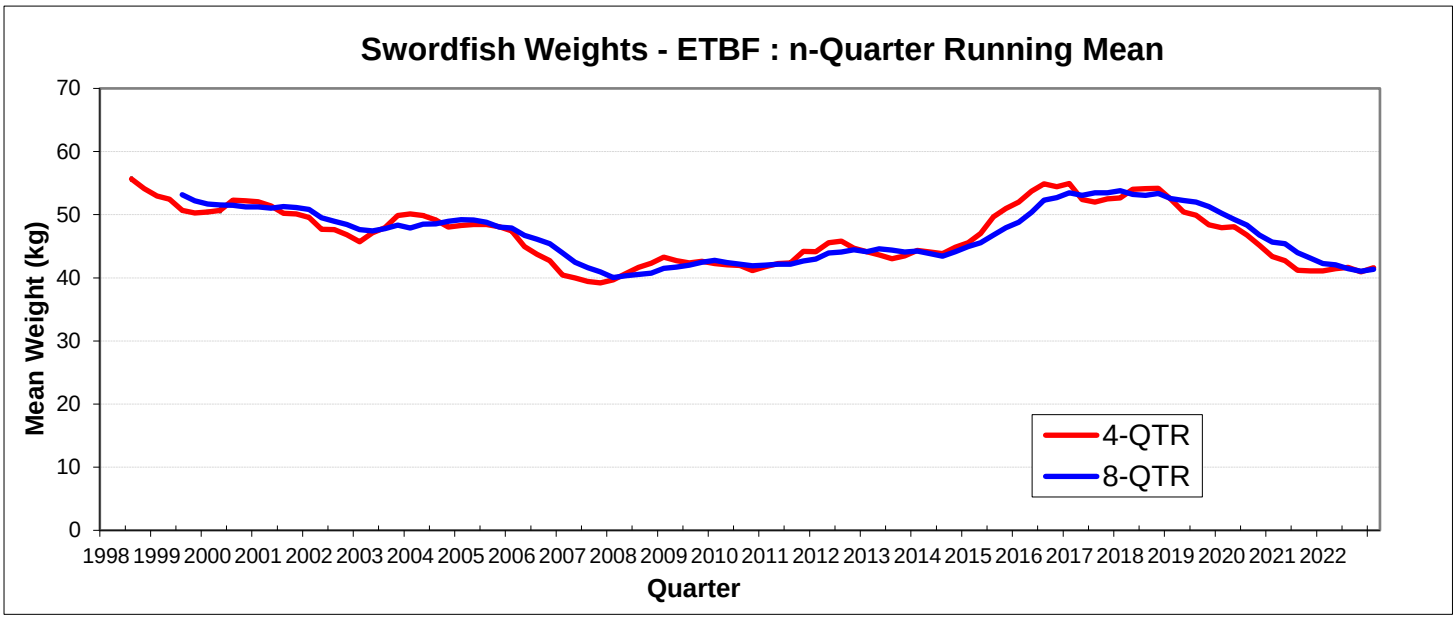
c)


Yellowfin
Mean Weight (kg)
70
60
50
40
30
20
10
0
1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
Quarter
4-QTR
8-QTR

d)


Striped Marlin
Mean Weight (kg)
80
75
70
65
60
55
50
45
40
1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
Quarter
4-QTR
8-QTR

e)


Swordfish Weights - ETBF : n-Quarter Running Mean
Mean Weight (kg)
70
60
50
40
30
20
10
0
1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
Quarter
4-QTR
8-QTR

# 3 Coastal state reporting

There are currently no foreign fishing vessels licensed to operate in the AFZ.

# 4 Socio-economic factors

In 2015–16, the gross value of production (GVP) of the ETBF reached an 11-year peak in real terms (2021–22 dollars) of $55.3 million reflecting increased catch of all key targeted species and generally improved prices that year. GVP has since remained below the value achieved in 2015–16 because of falling catch volumes between 2015–16 and 2021–22 and despite generally improved prices for key species during that time period. In 2021–22 GVP decreased from the previous financial year by 3% to $34.7 million largely because of lower yellowfin tuna catch volume.

# 5 Dispatch of catch

The combined value of Australian exports of albacore, bigeye tuna and yellowfin tuna (the three key species of tuna caught in the WCPFC) decreased from the previous financial year by 29% to $10.1 million in 2021–22. The export value of albacore, bigeye tuna and yellowfin tuna decreased, driven by lower export volumes (and offsetting higher export prices) for all three species. The decline in export value was most significant for yellowfin tuna, down by 46% to $4.3 million. Swordfish is typically the second most valuable species group landed in the ETBF after yellowfin tuna. In 2021–22 the value of swordfish exports increased by 123% to $4.0 million, reflecting higher export volumes and prices.

# 6 Onshore developments

Nil

# 7 Future prospects for the fishery

Commercial operators view the Australian skipjack fisheries as an important development opportunity because significant catching capacity exists in Port Lincoln, South Australia. Currently, catches are low as a result of variability in the availability of skipjack tuna in the AFZ, variable participation levels, low profit margins and the closure of the Port Lincoln cannery; however, there is room for development in this fishery.

The AFMA Commission agreed on the total allowable commercial catches (TACCs) for the ETBF. These apply to the 2022 season which commenced on 1 January 2022. The TACCs for the five main target species are: albacore (2,500 t); bigeye tuna (1,056 t); swordfish (1,047 t); striped marlin (351 t); and yellowfin tuna (2,400 t).

# 8 Status of data collection systems

## 8.1 Logbook data collection and verification

AFMA introduced a logbook for domestic longliners in 1986. The logbook has been revised on several occasions. The latest (AL06—Australian Pelagic Longline Daily Fishing Log) was introduced in 2007; vessels began submitting AL06 logbooks in November 2007. Return of logbooks by Australian longliners improved when, in 1995, it became a condition of fishing permits and has been close to 100% in recent years. Logbooks have also been introduced for the skipjack tuna purse-seine fisheries; PS01—Australian Purse Seine Daily Fishing Log was distributed in July 2002 with the first skipjack tuna catch recorded in this logbook in December 2003. Weights from catch disposal records are verified; weights recorded on logbooks are an estimate only. From 1 July 2015 logbooks have been verified through e-monitoring. As of 2021, all reporting in the ETBF is done via electronic logbooks.

## 8.2 Observer program

AFMA observers were deployed on domestic longliners from 2001 to 2015. From July 2003 to 2015, observers were deployed more broadly across the fishery with more general duties, such as the collection of data on fishing gear and the size and species composition of catches.

AFMA implemented a trial of e-monitoring to evaluate the effectiveness of this technology for a range of fishery monitoring purposes and to conduct a cost–benefit analysis in 2009–10 (Piasente et al. 2012). E-monitoring became compulsory for all ETBF longline vessels from 1 July 2015. E-monitoring replaced human observers in the ETBF for all in-zone observer requirements, although the government maintains the right to place human observers on board vessels if there is a need to do so. At least 10% of the video footage from all hauls is reviewed to verify the accuracy of logbooks which are required to be completed for 100% of shots. This review rate may be increased in some cases. In 2022, the coverage rate was 9.4% (Table 11). During the reporting period, Australian vessels operated principally in Australian waters with occasional forays onto the high seas. Australia's national observer program is accredited under the WCPFC ROP.

**Table 11. Summary of longline observer coverage (by hooks) for 2022**

| CCM Fleet | Fishery | No. of Hooks | | | Days fished | | | Days at sea | | | No. of trips | | | See notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total est. | Obs. | Obs % | Total est. | Obs. | Obs % | Total est. | Obs. | Obs % | Total est. | Obs. | Obs % | |
| Australia | Domestic | 6.9 million | 649,126 | 9.4 | | | | | | | | | | Nil |

Note: Blacked-out cells are not applicable.

## 8.3 Port sampling program

The collection of individual processed fish weights from processors receiving longline caught fish from the ETBF commenced in mid-1997. The program mainly focuses on the five principal target species in the fishery (yellowfin tuna, bigeye tuna, albacore, swordfish and striped marlin), though data on a range of other species have also been collected. During the period from July 1997 to December 2022 over 2.2 million individual fish weights pertaining to the five main target species have been collected. Coverage rates (% of landed fish sampled) for the target species are generally

high, and for the 5-year period between 2018 and 2022 have averaged around 87% for yellowfin tuna, 93% for bigeye tuna, 93% for swordfish and 94% for striped marlin, while for albacore 3% of landed fish have been individually sampled (Table 12). Individual fish weights for another 310,866 fish from 51 non-target species have also been collected across all years. Bulk weights for albacore sampled in batches (covering on average 93% of the catch between 2018 and 2022) and some other species are also collected. Where both the total batched weight and the number of fish have been recorded, these bulk weights cover 1,449,883 fish for 39 species (including 1,001,263 albacore).

**Table 12. Estimated annual coverage of operational catch and effort (logbooks), observer data (% hooks) and port sampling (% coverage rate for the five main target species of individual fish weights collected from processors receiving longline-caught fish in the ETBF) for the Australian fleet active in the WCPFC Convention Area, 2018–22.**

| Gear | Year | Operational catch & effort coverage (%) | Observer coverage (%) | Port sampling coverage (%) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | YFT | BET | ALB | SWO | STM | SKJ |
| Longline[a] | 2018 | 100 | 10.8 | 74 | 91 | 3 | 96 | 91 | 0 |
| | 2019 | 100 | 11.7 | 91 | 100 | 4 | 95 | 100 | 0 |
| | 2020 | 100 | 9.7 | 88 | 96 | 3 | 94 | 93 | 0 |
| | 2021 | 100 | 9.9 | 91 | 91 | 3 | 92 | 94 | 0 |
| | 2022 | 100 | 9.4 | 90 | 91 | 3 | 90 | 90 | 0 |
| Purse seine | 2018 | NA | NA | NA | NA | NA | NA | NA | NA |
| | 2019 | NA | NA | NA | NA | NA | NA | NA | NA |
| | 2020 | NA | NA | NA | NA | NA | NA | NA | NA |
| | 2021 | NA | NA | NA | NA | NA | NA | NA | NA |
| | 2022 | NA | NA | NA | NA | NA | NA | NA | NA |

[a] includes fish taken by minor line
Abbreviations: yellowfin tuna (YFT), bigeye tuna (BET), albacore (ALB), striped marlin (STM), swordfish (SWO) and skipjack (SKJ)
Sources: Scott Cooper (CSIRO) and AFMA observer database

## 8.4 Unloading/transhipment

Catch disposal records are the formal method for monitoring unloads and were implemented in the ETBF in January 2006 (Table 13). Catch disposal records are completed by both the fisher and licensed fish receiver at the point of unload to obtain accurate data on fish numbers and verified weight by species. Skippers tend to under-estimate the weights reported in logbooks for most species, so the catch disposal record data have been reported in domestic official statistics since 2007 and are the authoritative figures for retained catch in the fishery. Compliance checks are conducted on unloads as part of a risk-based compliance programme. Weight estimates are also derived from the size-monitoring program and are likely to be more accurate than logbook data for that part of the time series.

**Table 13. Annual catch estimates (converted whole weights) for the ETBF for 2018–22 derived from catch disposal records. Estimates are in tonnes.**

| Year | Albacore | Yellowfin | Bigeye | Striped marlin | Swordfish | Other | Total |
|---|---|---|---|---|---|---|---|
| 2018 | 889.1 | 1516.5 | 367.5 | 245.6 | 1026.9 | 1448.0 | 5493.6 |
| 2019 | 923.8 | 2089.0 | 284.5 | 250.8 | 793.1 | 1133.9 | 5475.0 |
| 2020 | 1176.8 | 1856.4 | 308.2 | 204.4 | 610.6 | 1082.3 | 5238.7 |
| 2021 | 1094.7 | 1593.3 | 391.9 | 207.1 | 619.8 | 1245.0 | 5150.9 |
| 2022 | 1134.2 | 1367.4 | 347.8 | 284.0 | 727.4 | 1192.6 | 5053.3 |

One transhipment activity was undertaken in 2022 (Tables 14 and 15). No Australian vessels were authorised to tranship on the high seas.

**Table 14. Transhipment quantities by weight for Australian longline vessels in 2022 within the WCPFC Convention Area**

| | Location | Transhipped within Convention Area (CA)? | Caught within Convention Area (CA)? | Product Form? | Fishing gear | Species | Kg |
|---|---|---|---|---|---|---|---|
| **Offloaded** | 23’01S 154’09E | 1 | Yes | Fresh, whole* | Longline | Yellowfin tuna = 770<br>Bigeye tuna = 95<br>Swordfish = 120<br>Albacore = 18<br>Striped marlin = 515<br>Mahi mahi = 110<br>Wahoo = 62<br>Shortfin mako shark = 40 | |

*Billfish can have their bills removed at sea in the ETBF.

**Table 15. Number of transhipment for Australian longline vessels in 2022**

| | | Transhipped within Convention Area (CA)? | Caught within Convention Area (CA)? | Fishing gear | Number of Transhipments |
|---|---|---|---|---|---|
| Offloaded | | 1 | Yes | Longline | 1 |

## 8.5 Other

AFMA introduced the compulsory requirement for all Commonwealth endorsed fishing vessels to be fitted with Integrated Computer Vessel Monitoring Systems (ICVMS) in 2007. For 2022, no ETBF vessel received formal warnings for non-operational ICVMS. There were no other ICVMS infringements. Compliance with ICVMS requirements has increased markedly since mid-2008. AFMA uses the ICVMS to assist in planning inspections and operations, to assist the observer program in deploying scientific observers and to actively monitor compliance with closed areas.

A range of data is also collected via individual research projects (see the Research Activities section for more information).

# 9 Research activities

The Australian Government and the fishing industry allocate considerable funds to fishery research and monitoring each year. In addition to the logbook and observer programs, key areas of research in past years and ongoing research include:

## 9.1 Biological research projects

- Reproductive dynamics of swordfish in the domestic longline fishery off eastern Australia (Young & Drake 2002)
- Age and growth of bigeye tuna from the eastern and western AFZ (Farley et al. 2003)
- Age and growth of swordfish from Australian waters (Young & Drake 2004)
- Population biology and habitat preferences of striped marlin in eastern Australia (Keller & Davie 2009)
- Population biology of albacore tuna in the Australian region (Farley et al. 2012)
- Spatial dynamics of swordfish in the south Pacific Ocean (Evans et al. 2012)
- Defining regional connections in southwest Pacific swordfish (Wilcox 2012)
- Determination of swordfish growth and maturity relevant to the southwest Pacific stock (Farley et al. 2016)
- Age, growth and maturity of bigeye tuna in the western and central Pacific Ocean (Farley et al. 2018)
- Yellowfin tuna age and growth in the Western and Central Pacific Ocean (Farley et al. 2020)
- Feasibility of close-kin mark-recapture assessment for South Pacific albacore in the WCPO (Bravington et al 2021)
- Bomb radiocarbon age validation for bigeye and yellowfin tunas in the WCP (Andrews et al. 2022)

## 9.2 Assessment-related research projects

- Dynamics of the interactions of the fishery and swordfish on seamounts off eastern Australia (Campbell & Hobday 2003)
- Migration and habitat preferences of bigeye tuna on the east coast of Australia (Gunn et al. 2005)
- Stock assessment of striped marlin in the south-western Pacific Ocean (Langley et al. 2006)
- Developing harvest strategies for the ETBF (AFMA 2007)
- Developing robust stock-status indicators (Basson & Dowling 2008)

- Updating the stock assessment of swordfish in the south Pacific Ocean (Kolody, Campbell & Davies 2008)
- Determining the depths fished and the effective longline effort targeted at various species in the ETBF (Campbell & Young 2010)
- Integrated evaluation of management strategies for tropical multi-species long-line fisheries (Kolody et al. 2010)
- Eastern Tuna and Billfish Fishery size monitoring program (Williams et al. ongoing)
- Integrated analysis and assessment supporting implementation of the management and harvest strategy framework within the ETBF (Campbell 2011)
- Predicting the impact of hook decrementation on the distribution of fishing effort in the ETBF (Wilcox et al. 2011)
- Analysis of recreational fishing catch and effort data to support the striped marlin stock assessment (Ghosn et al. 2012)
- Standardisation of commercial catch and effort data to support the stock assessment of striped marlin (Campbell 2012)
- Changes in fishing strategies in the ETBF in response to the introduction of quota management (Preece, Cambell & Hillary 2012)
- Development of an approach to harvest strategy management of internationally managed multi-species fisheries (Hillary et al. 2016)
- Developing innovative approaches to improve CPUE standardisation for Australia's multi-species longline fisheries (Campbell et al. 2017)
- Data management, assessment and implementation of harvest strategies for Australia's tropical tuna fisheries (Campbell 2017)
- Determination of the spatial dynamics and movement rates of the principal target species within the Eastern Tuna and Billfish Fishery and connectivity with the broader western and central Pacific Ocean - beyond tagging (Evans et al. 2021)
- Data management, assessment and implementation of harvest strategies for Australia's tropical tuna fisheries (Campbell et al. 2020)
- ETBF striped marlin harvest strategy revision and evaluation (Preece 2021)
- Management strategy evaluation of the broadbill swordfish ETBF harvest strategies (Hillary 2020)
- Data management, assessment and implementation of harvest strategies for Australia's tropical tuna fisheries (Campbell et al. 2020; Williams et al. 2023)
- Scientific advice for management of Tropical Tuna and Billfish Fisheries (CSIRO, July 2023-May 2026)

## 9.3 Ecological research projects

- Ecological risk assessment for the effects of fishing (Webb et al. 2007)
- Rapid quantitative assessment (Zhou, Smith & Fuller 2007)
- Determining the ecological impacts of longline fishing in the ETBF (Young et al. 2009)
- Ecological risk assessment for the effort of fishing report for the Eastern Tuna and Billfish Fishery: Longline sub-fishery, data since 2015 (Sporcic et al. 2019)
- Investigation of oceanographic and environmental factors impacting on the ETBF (Hartog et al. 2023; Scales et al. 2023)

## 9.4 Bycatch research projects

- A review of byproduct interactions and economics in Australia's tuna and billfish fisheries (Bromhead et al. 2005)
- Marine turtle mitigation in Australia's pelagic longline fishery (Robins et al. 2007)
- The effects of bycatch mitigation measures, such as circle hooks and wire leaders, on target and non-target catches (Ward et al. 2008)
- Effect of line shooters on the sink rates of pelagic longlines and the effect on seabird interactions (Robertson, Candy & Wienecke 2010a)
- Factors affecting the sink rates of baited hooks and the impact on seabird interactions in pelagic longline fisheries (Robertson & van den Hoff 2010; Robertson et al. 2010b; Robertson & Candy 2013)
- Branch line weighting regimes to reduce the incidental catch of seabirds in pelagic longline fisheries (Robertson et al. 2013)
- The effects of propeller turbulence on sink rates of baited hooks (Robertson & Candy 2014)
- Development of an underwater bait setting system (Robertson et al. 2015)
- Improving the effectiveness, efficiency and safety of mitigation tools for protected species interactions in the Eastern Tuna and Billfish Fishery (FRDC 2020-041, 2020, ongoing).
- Improving the management of wildlife interactions in pelagic longline fisheries (FRDC 2021-078, 2021, ongoing).

# Appendix A: Common and Scientific Names

| Common names | Scientific names |
|---|---|
| Albacore | *Thunnus alalunga* |
| Albatrosses (other) | *Diomedeidae* spp. |
| Australian fur seal | *Arctocephalus pusillus doriferus* |
| Australian gannet | *Morus serrator* |
| Australian sea lion | *Neophoca cinerea* |
| Baleen whale | Mysticeti |
| Bigeye tuna | *Thunnus obesus* |
| Birds | Aves |
| Black marlin | *Makaira indica* |
| Black-browed albatross | *Thalassarche melanophrys* |
| Blacktip sharks | *Carcharhinus* spp. |
| Blue marlin | *Makaira mazara* |
| Blue shark | *Prionace glauca* |
| Bottlenose dolphin | *Tursiops truncatus* |
| Bronze whaler shark | *Carcharhinus brachyurus* |
| Buller's albatross | *Thalassarche bulleri* |
| Cape petrel | *Daption capense* |
| Common dolphin | *Delphinus delphis* |
| Cormorants | *Phalacrocoracidae* |
| Dolphin | Delphinidae |
| Dugong | *Dugong dugon* |
| Dusky shark | *Carcharhinus obscurus* |
| Escolar | *Lepidocybium flavobrunneum* |
| False killer whale | *Pseudorca crassidens* |
| Flatback turtle | *Natator depressa* |
| Flesh-footed shearwater | *Puffinus carneipes* |
| Great crested tern | *Sterna bergii* |
| Great skua | *Catharacta skua* |
| Great-winged petrel | *Pterodroma macroptera* |
| Green turtle | *Chelonia mydas* |
| Grey-headed albatross | *Thalassarche chrysostoma* |
| Hammerhead shark | *Sphyrna* spp. |
| Hawksbill turtle | *Eretmochelys imbricata* |
| Humpback whale | *Megaptera novaeangliae* |
| Lancetfish | *Alepisaurus sp.* |
| Leatherback turtle | *Dermochelys coriacea* |
| Loggerhead turtle | *Carretta carretta* |
| Long-finned pilot whale | *Globicephala melas* |
| Longfin mako | *Isurus paucus* |
| Mahi mahi | *Coryphaena hippurus* |
| Melon-headed whale | *Peponcephala electra* |
| Moonfish (opah) | *Lampris guttatus* |
| New Zealand fur seal | *Arctocephalus fosteri* |
| Northern bluefin tuna | *Thunnus orientalis* |
| Ocean sunfish | *Mola mola* |
| Oceanic whitetip shark | *Carcharhinus longimanus* |
| Oilfish | *Ruvettus pretiosus* |
| Pacific (olive) ridley turtle | *Lepidochelys olivacea* |
| Petrels, prions and shearwaters | *Procellariidae* spp. |

| | |
|---|---|
| Porbeagle | *Lamna nasus* |
| Ray's bream | *Brama brama* |
| Rudderfish | *Centrolophus niger* |
| Sailfish | *Istiophorus platypterus* |
| Scalloped hammerhead | *Sphyrna lewini* |
| Seals | Phocidae |
| Shearwaters | *Puffinus* spp. |
| Shortbill spearfish | *Tetrapturus angustirostris* |
| Shortfin mako | *Isurus oxyrinchus* |
| Short-finned pilot whale | *Globicephala macrorhynchus* |
| Short-tailed shearwater | *Puffinus tenuirostris* |
| Shy albatross | *Thalassarche cauta* |
| Silky shark | *Carcharhinus falciformis* |
| Skipjack tuna | *Katsuwonus pelamis* |
| Smooth hammerhead | *Sphyrna zygaena* |
| Sooty shearwater | *Puffinus griseus* |
| Southern bluefin tuna | *Thunnus maccoyii* |
| Southern royal albatross | *Diomedea epomophora* |
| Striped marlin | *Kajikia audax* |
| Swordfish | *Xiphias gladius* |
| Thresher shark | *Alopias vulpinus* |
| Tiger shark | *Galeocerdo cuvier* |
| Toothed whale | Odontoceti |
| Turtles | Testudinata |
| Wahoo | *Acanthocybium solandri* |
| Wandering albatross | *Diomedea exulans* |
| Wedge-tailed shearwater | *Puffinus pacificus* |
| Westland petrel | *Procellaria westlandica* |
| Whale shark | *Rhincodon typus* |
| Wilson's storm petrel | *Oceanites oceanicus* |
| Yellowfin tuna | *Thunnus albacares* |
| Yellow-nosed albatross | *Thalassarche chlororhynchos* |

# Appendix B: Mandatory mitigation measures in the ETBF 2023

***(Source: AFMA website)***

*file:///C:/Users/Patterson%20Heather/Downloads/2023-etbf-management-arrangements-booklet.pdf*

## Seabirds

At all times you must:

- Carry more than one assembled tori lines on board
- Not discharge offal while setting
- Carry at least three seabird feather kits onboard
- Comply with seabird interaction obligations relating to the Threat Abatement Plan (TAP).

When you are fishing south of 25°S you must:

- Deploy a tori line before commencing a shot when fishing between the hours of nautical dawn and nautical dusk
- A tori line if not required to be deployed when performing fishing operations between the hours of nautical dusk and nautical dawn
- Use only non-frozen bait
- Weight longlines with either a minimum of:
    - 60 g weights at a distance of no more than 3.5 m from each hook ; or
    - 98 g weights at a distance of no more than 4 m from each hook; or
    - 40 g weights immediately adjacent to the hook, or at no more than 0.5 m from the hook, with dead, non-frozen baits attached to the hooks or
    - a 'hook shielding device' attached and deployed directly to each hook according to minimum branchline specifications.

Note: If you are fishing south of 40° South, AFMA may require you to implement additional seabird mitigation measures as this is an area in which higher than average number of seabird interactions are possible.

Your tori line must be:

- At least 100 m long

- Must be deployed from a position on board the boat and utilise am additional towed line, ,aterial or object to create drag and ensure that it remains above the water surface for a minimum of 75 metres from the stern of the boat
- Have streamer attached at a maximum interval of 3.5 m
- Must have streamers attached to it with a maximum interval between the streamers of 3.5 metres
- All streamers must be maintained to ensure that their lengths are as close to the water as possible.

There are four key steps you need to undertake if a seabird is killed while you are fishing:

(1) Hold up the dead Seabird to the electronic monitoring camera for identification. At a minimum, the seabird must be held in view of and in close proximity to the closest or most convenient electronic monitoring camera. First, the head and bill (for 3 seconds), then underside with one wing outstretched (for 3 seconds), then the back of the bird with one wing outstretched (for 3 seconds).

(2) Collect a feather sample using a Seabird feather collection kit. Feathers must be pulled out, not cut, with feathers collected from the belly side and back side of the seabird. Samples must be marked with an ID label which includes:

- Date of interaction
- Time of interaction
- Latitude and Longitude of interaction
- Fishing method; and
- ID number

The bagged feather samples must be placed inside a second zip lock bag with absorbent material, then sealed, and posted to AAD using the reply paid envelope provided in the Seabird feather sample kit.

(3) Record the details of the interaction. You must record the details of the interaction as required in your e-logs. If you are unable to use e-logs for the trip, you will need to record the interaction in your Australian Longline Daily Fishing Log (AL06), circle 'Yes' in the box at the bottom of the log sheet and fill out the 'Listed Marine and Threatened Species' form (i.e. as for any other protected species interaction). afma.gov.au

(4) Comply with any additional Seabird interaction obligations relating to the Threat Abatement Plan (TAP). AFMA will notify you in writing that you are required to comply with additional Seabird interaction obligations if, within any five degree latitude zone, you meet one of the following criteria:

a. You have interacted with more than one Seabird and have exceeded the Seabird bycatch rate (0.05 birds per 1,000 hooks), during any two of the last three consecutive TAP seasons (NB: this can include the current TAP season).

b. You have interacted with more than 10 Seabirds in the current or previous TAP season.

c. You have been found to have an unreported Seabird interaction.

Once notified by AFMA, one of the following Seabird mitigation options must immediately be implemented:

- a daylight setting ban (ensure that all longline hooks are deployed only during the hours between nautical dusk and nautical dawn); or
- amended line weighting of either:
    - 40g or greater attached within 0.5 metre of the hook; or
    - 60g or greater attached within 1 metre of the hook; or
    - 80 g or greater attached within 2 m of the hook, or
- ACAP approved hook shielding devices on all hooks; or
- a northern shift in the area of operation (to at least 5 degrees north of the most northerly seabird interaction with the nominated vessel, as verified and notified by AFMA).

If, after implementing one of the seabird mitigation options listed above, either one additional albatross (dead) or two other seabirds (dead) are killed while your vessel is fishing, then one of the following additional mitigation measures must immediately be implemented:

- another mitigation measure from the list of seabird mitigation options above (that is in addition to the measure already implemented); or
- cease the use of live bait (if using) and only use dead bait; or
- relocate fishing activities to north of latitude 25 degrees south; or
- cease fishing using longlines for the remainder of the TAP season.

In each instance where additional mitigation is required, the period for which it needs to be applied ends when AFMA has notified you in writing that your boat has achieved a seabird by-catch rate less than 0.05 birds per 1000 hooks and accordingly the measures now cease to apply. (i.e. your rate is less than 0.05 birds per 1,000 hooks). If you again exceed the Seabird bycatch interaction rate within the TAP season, all additional mitigation measures will reapply.

# Sea turtles

**Circle hooks**

Large circle hooks must be used for shallow sets with less than 8 hooks per basket.

**De-hooking device**

At all times you must carry on board a minimum of one de-hooking device, with the following specifications:

- The device must enable the hook to be secured and the barb shielded so that the barb does not re-engage with the fish while the hook is being removed
- The device must be blunt with all edges rounded

- Where more than one size of hook is to be carried, a de-hooking device (or devices) must be carried that can be used with all hooks on the boat; and
- The shaft of the device must be a minimum of 1.5 metres in length.

**Line cutting device**

At all times you must carry on board a minimum of one line cutting device. The line cutting device must be constructed and used in accordance with the following specifications:

- The device must be constructed to allow the line to be cut as close to the hook as possible
- The blade of the device must be enclosed in a blunt rounded (arc-shaped) cover with the hook exposed on the inside of the arc; and
- The shaft of the device must be a minimum of 1.5 metres in length.

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