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Torres Strait Prawn Fishery

DATA SUMMARY 2015

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Scope of the Report

This document summarises catch and effort information for the Torres Strait Prawn Fishery (TSPF) from the 2015 fishing season. It is the first report of its kind for the TSPF and in future years may be expanded to include more data and information as required for the management the fishery. The data summary is a valuable tool for providing feedback to stakeholders on logbook data received by AFMA. It is also used by the Torres Strait Prawn Management Advisory Committee in guiding management recommendations and discussions. The data summary is sent to license holders annually but is available to all stakeholders via the PZJA website (www.pzja.gov.au).

If you have any comments or questions relating to this document please contact

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Also note that this Data Summary is available on the PZJA website.

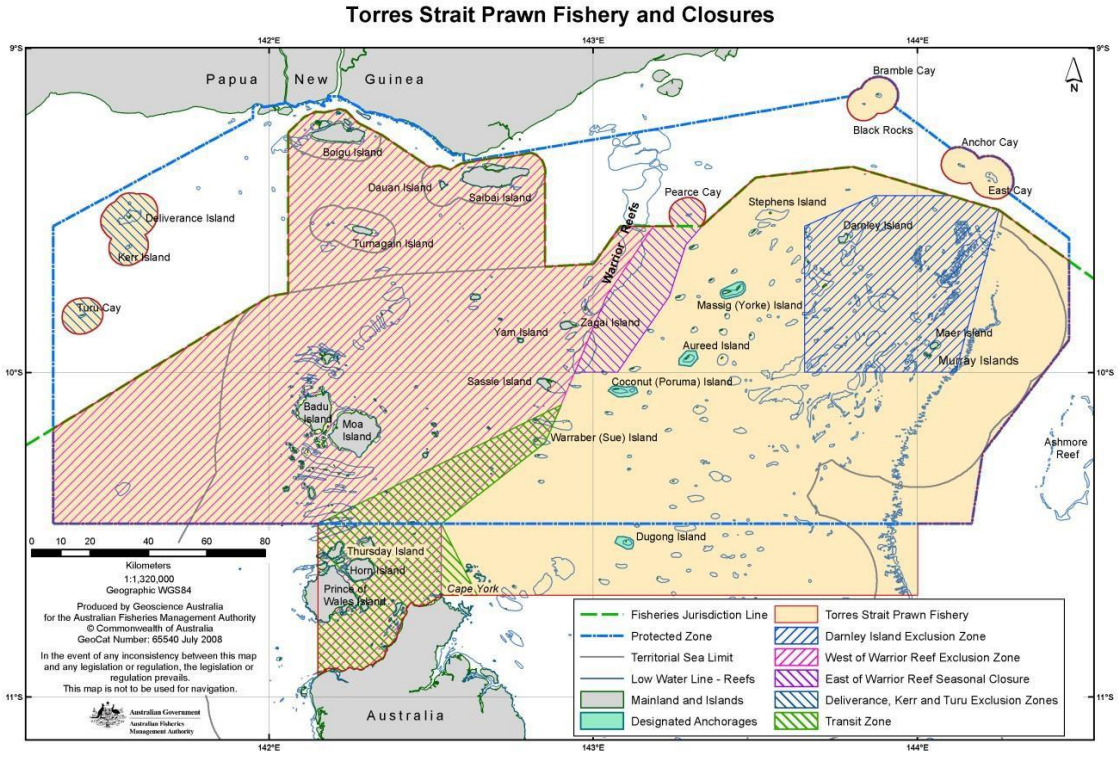
Contents

Introduction

The TSPF Data Summary 2015 contains catch and effort data by prawn species, area and time. As logbook records were still being submitted for the later part of the 2015 season when this analysis was done the final 2015 catches and logbook effort will most likely be higher than those shown in this data summary.

Thank you to the cooperative trawler skippers for submitting their logbook information, an essential record of catches and effort for the fishery has been built up over many years. This “time-series” of data is used to monitor trends in fishing effort, catches and catch rates by area (spatial trends), time (temporal trends) and species. A long time-series with wide variations in fishing effort and catches is needed for stock models. These models are used to estimate the level of fishing effort and catch that will ensure sustainability of the harvest while maximising the productivity of the fishery.

Description of the Torres Strait Prawn Fishery



The TSPF is a multi-species prawn fishery which operates in the eastern part of the Torres Strait. Brown tiger prawns (*Penaeus esculentus*) and blue endeavour prawns (*Metapenaeus endeavouri*) are the key target species. Red spot king prawns (*Melicertus longistylus*), Moreton Bay bugs (*Thenus spp.*), scallops (*Amusium* spp.), slipper and shovel-nosed lobster (*Scyllaridae*) and squid (*Teuthooidea*) are taken as by-product.

Fishing is permitted in the TSPF from 1 March to 1 December each year and is limited by a Total Allowable Effort (TAE) in the form of fishing days. Fishing for prawns in the TSPF occurs at night, primarily using the otter trawl method which involves towing two, three or four trawl nets behind a vessel. The TSPF has restrictions on the quantity of net and length of vessel that can be used to operate in the fishery.

For detailed information on the management of the TSPF you can download the TSPF Handbook from the PZJA website (www.pzja.gov.au).

Data Collection Program

All TSPF operators are required to complete the 'Northern and Torres Strait Prawn Fisheries Daily Fishing Log' (NP16), a paper logbook on a daily basis. Alternatively, an electronic version (e-log) can be used. Only a small percentage of operators are currently using e-logs in the TSPF. Both paper logbook and e–log data is included in this data summary. VMS data is also used in the data report to provide an estimate of the coverage of the fishing effort by the logbook records. This is especially relevant to the most recent fishing year where paper records are still being submitted after the data was downloaded for analysed.

Methods Used For Preparing Data Summary

The data used to prepare the Torres Strait Prawn Fishery Data Summary is comprised of logbook information (NP16 and e-log) submitted by TSPF skippers and the VMS data collected by the PZJA. This information is stored by AFMA on the Torres Strait Prawn database.

The data used in this summary was extracted during December 2015. The data is checked using species and fishing positions constraints to identify any records that have been incorrectly assigned to the TSPF. These records are filtered out and returned to the AFMA data section for checking and correction.

The effort estimates in Figures 1 and 2 are derived from VMS data for the years since 2005. Figures 1-3, 8 and Table 1 are derived from a combination of logbook and VMS data. The remainder of the tables and figures in the summary represent logbook data only. This may cause discrepancies between totals. Minor discrepancies may also occur due to rounding of values.

Catch and Effort Data for the Torres Strait Prawn Fishery

Total fishing days in the area of the fishery

The total fishing days in the area of the Torres Strait Prawn Fishery (TSPF) from 1993- 2015 are plotted in Figure 1 and the total percentage of days used in 2015 is shown in Figure 2.

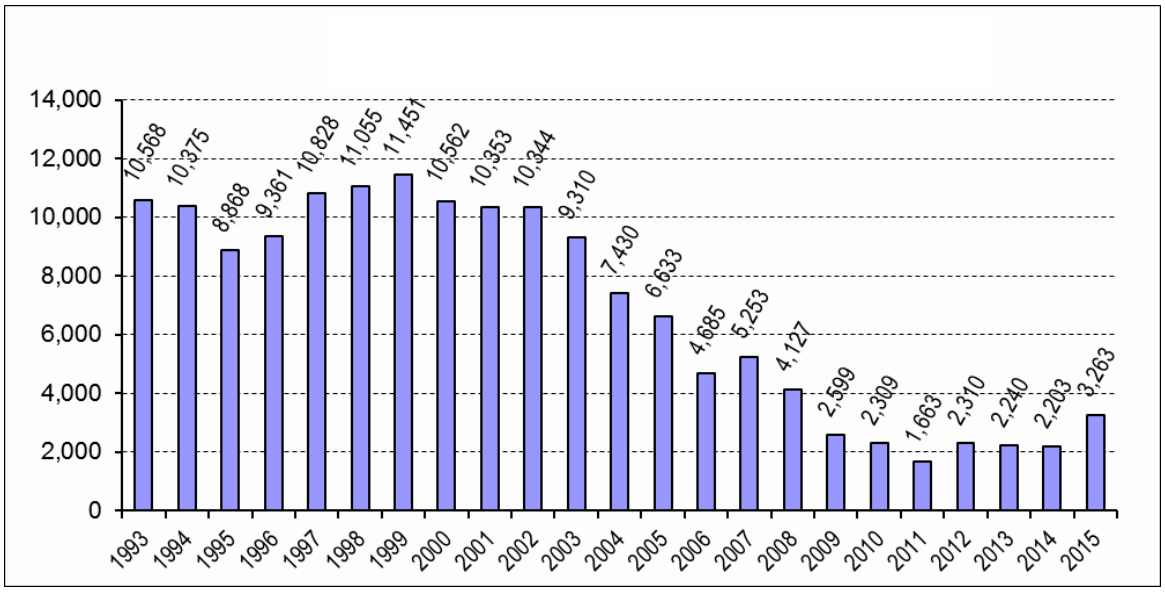


Figure 1 Total days fished in the area of the fishery 1993-2015.

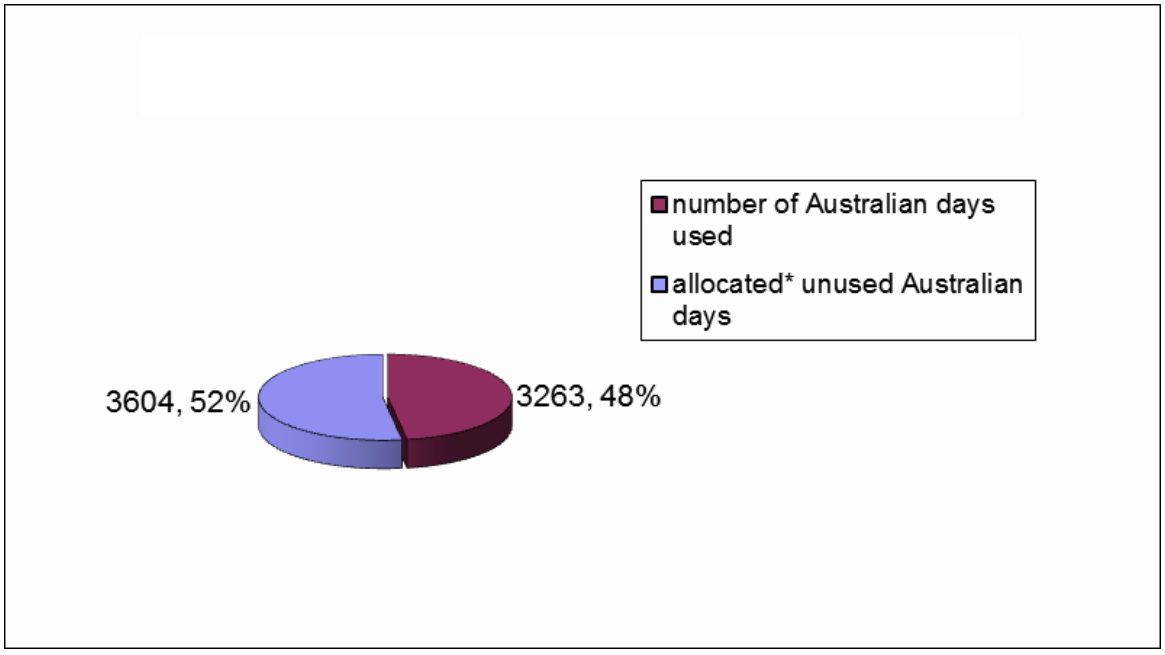


Figure 2 Proportion of the total allocated fishing days used in the TSPF for the 2015 season.

Prior to 2005 the fishing days were based on a manual reporting system that was used to track the number of days that vessels were registered as being in the Torres Strait and deemed as fishing. This system started in 1993 when the "days" of fishing access were first implemented in the TSPF. Since 2005 fishing days have been calculated from the Vessel Monitoring System (VMS) data.

Catch and effort by year

Following a general downward trend from 2001 fishing effort stabilised at around 2,000 nights after 2011 (Figure 3). The 2011 fishing season was the year of lowest fishing effort and catches since 1989. The 2014 tiger and endeavour prawn catches were lower than the two preceding years (2012-13) due to lower catch rates. The final 2015 tiger and endeavour prawn catches could be the highest since 2008 as a result of the highest effort since 2008 (Figure 3, Table 1) and higher catch rates (Figure 5).

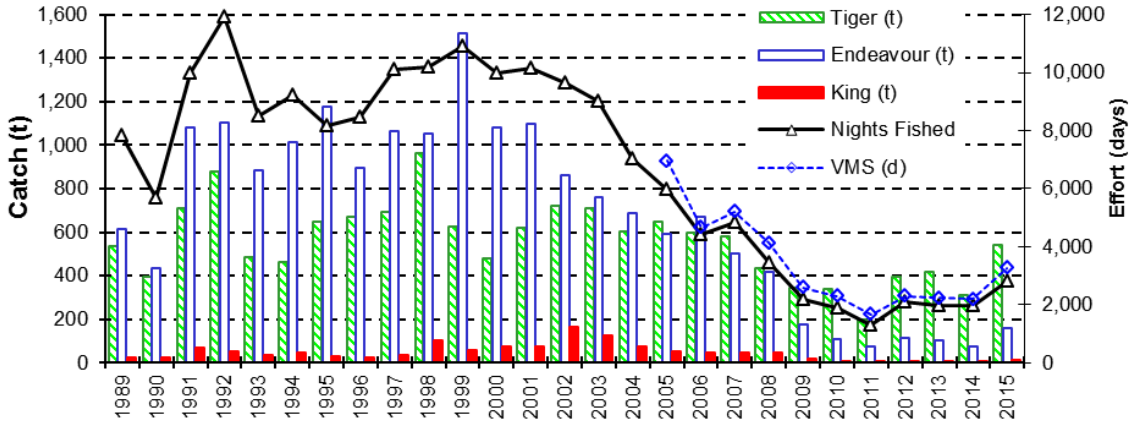


Figure 3 Prawn catches by species (columns) and effort (line). Note that the 2015 logbook data was incomplete at the time of analysis.

Table 1 Yearly totals since the 2005 effort reduction *(t = tonnes)*.

	Hours Trawled	Nights Fished	VMS	All prawn (t)	Tiger (t)	Endeavour (t)	King (t)
2005	63,300	5,966	6,957	1,311	651	594	51
2006	47,273	4,407	4,654	1,331	602	672	45
2007	51,398	4,832	5,218	1,137	582	503	47
2008	37,023	3,453	4,127	907	439	418	48
2009	19,435	2,165	2,599	547	348	178	17
2010	20,480	1,879	2,309	465	344	110	9
2011	14,613	1,309	1,663	283	204	74	4
2012	23,337	2,081	2,310	517	398	115	3
2013	22,061	1,993	2,240	528	420	103	4
2014	21,983	1,954	2,203	393	315	76	3
2015	31,361	2,832	3,263	716	542	161	11
Average (2010-2014)	20,495	1,843	2,145	437	336	96	5
Average (1991-2001)	103,678	9,781		1,806	659	1,087	56
	Emsy	9,197		MSY	676	1,044	

Fishing effort is plotted in Figure 3 using the number of daily vessel logbook records (Nights Fished) and the Vessel Monitoring System data (VMS). The “VMS” plot (or line) is slightly higher than the “Nights Fished” plot as vessels are automatically flagged as fishing when steaming at trawl speed or if the VMS unit fails to poll. Fishers can claim a credit if they can verify that they were not fishing but often do not if it is near the end of the season and they have unused days of access.

Table 1 lists the yearly fishing effort and catches by species group since 2005. It was during November 2005 that allowable fishing effort was reduced to implement the Total Allowable Effort (TAE) of 9,200 effort unit. The two average rows at the bottom of Table 1 compare catch and effort for the last 5 years of complete data (2010-14) with the period of highest effort (1991-2001). The boxes below the table list the estimates of tiger prawn Effort at Maximum Sustainable Yield (Emsy) and Maximum Sustainable Yield (MSY) in Tonnes for tiger and endeavour prawns from stock assessments. Note that the “All prawn” column includes “mixed prawn” and other minor categories and so may be higher than the sum of the tiger, endeavour and king prawn columns. The 2015 catches and “Nights Fished” are based on incomplete data.

During the years 2001 to 2007 the tiger prawn catch remained close to the long term average despite the large decrease in fishing effort whereas endeavour prawn catch immediately tracked downward, mirroring the decrease in effort (Figure 3). After 2007 the catch of both tiger and endeavour prawn tracked downward and reached their lowest points in 2011 when fishing effort was at its lowest.

The decline in fishing effort after 2001 was mainly driven by increasing fuel prices and decreasing produce value making it less profitable to fish. The decrease in the endeavour prawn catch occurred first because it is the lower value product and it was more profitable for fishers to target areas of higher tiger prawn catch rates. Although tiger and endeavour prawns are almost always caught together, fishers can target a specific species to a certain amount, as the distribution of prawn stocks on the seabed is “patchy”. There are areas of higher tiger prawn catch rates often only a few miles away from areas of lower tiger prawn catch rates but higher endeavour prawn catch rates. Some TSP fishers have stated that they “target dollars rather than a particular species”; i.e. the species mix that provides the highest return.

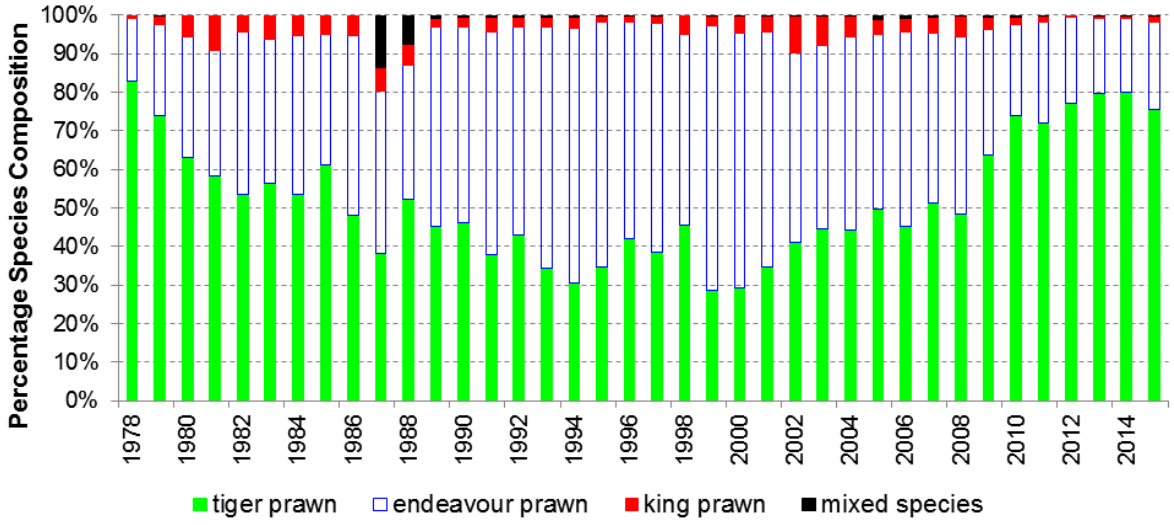


Figure 4 The percentage species composition of the prawn harvest by weight for each year. The percentages for the years prior to 1989 are based on unload records and the remainder are based on AFMA logbook data.

The prawn fishery in Torres Strait began in the mid-1970s. Based on the first year of unloading records in 1978, tiger prawn made up 83% of the 338 tonne harvest while endeavour prawn was only 16% of the catch. During the years 1989-2004 endeavour prawn was the largest component of the annual catch (48-60%). Since 2009 the species composition has reverted back to that observed in the early years of the fishery (Figure 4). The 2013 and 2014 harvests were 80% tiger prawn, 19% endeavour prawn and 1% king prawn; these are the highest percentages for tiger and lowest for endeavour since 1978. During the 2015 fishing season the percentage of tiger prawn decreased slightly because the endeavour prawn catch (161t) was well above the previous five year average (96t, Table 1). The changes in species composition over the years have been driven by variability in the annual recruitment of each species and changes in the landed value of each species. Recruitment determines the abundance of each species on the sea bed and the landed prices influence which species are targeted by fishers.

King prawns have always been a small component of the catch and is regarded as a by-product of fishing for tiger and endeavour prawns. In Torres Strait the king prawn catch category consists almost entirely of the Red Spot King prawn (Melicertus longistylus). During March to May of 2002 and 2003 the monthly catches (Figure 11) were the highest recorded and the proportion of king prawns was higher than the long term average (Figure 4) suggesting that these were years of above average recruitment for Red Spot King prawn.

Fishing catch rates and stock biomass

Figure 5 shows the trends in “catch rates” or “Catch Per Unit of Effort” (CPUE) for the total prawn harvest and the tiger and endeavour prawn components of the catch. This is measured as the average kilograms of catch per boat day of fishing (kg/d). Because catch rates are often lower at the end of the season and the logbook data for the later part of the 2015 season was incomplete when the data was analysed, the final estimates of the CPUE for 2015 may be slightly lower than those plotted in Figure 5 and listed in Table 2.

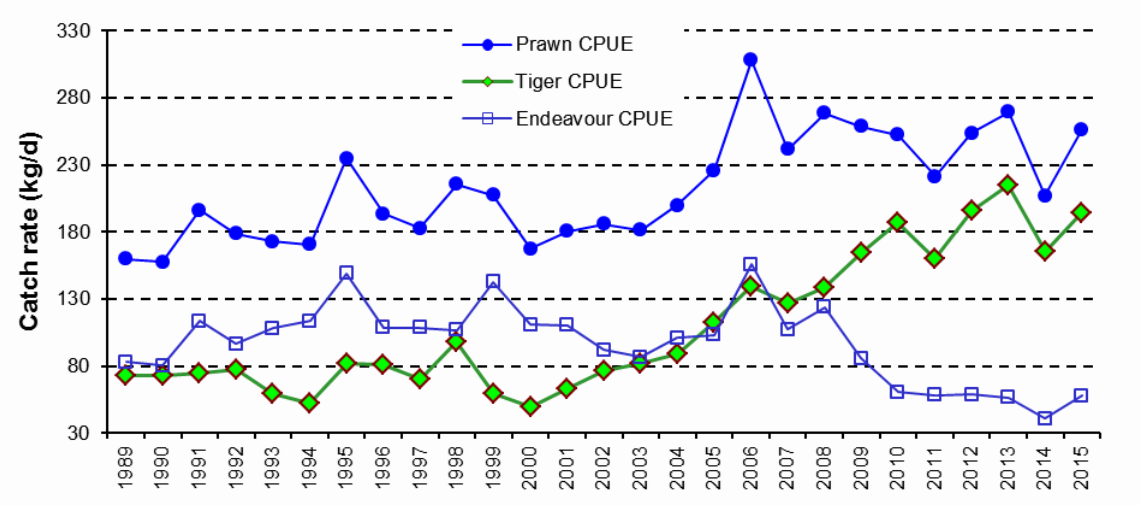


Figure 5. Yearly CPUE indices for tiger, endeavour and the total prawn catch. Note that the scaling of the Y-axis is not set to zero, i.e. the base of the graph (X-axis) is set at 30 kg/d.

The 2015 CPUE of all prawn species combined was above the previous five year average. The 2014 prawn CPUE was the lowest since 2004 due to the drop in both tiger and endeavour CPUE’s but was still above the average for the years of highest (1991-2001) effort. The highest prawn CPUE was in 2006 as a result of higher than average catch rates for both tiger and endeavour prawn.

During the 2015 fishing season the annual tiger prawn CPUE was above the previous five year average but slightly lower than the 2012 and 2013 CPUE’s. Although the 2014 tiger prawn CPUE was lower than in 2010, 2012 and 2013 it was still more than double the 72 kg/d average tiger prawn catch rate for the 1990’s (Figure 5 and Table 2). The lower tiger prawn CPUE in 2014 is most likely a result of the natural variability in recruitment of tiger prawn stocks.

The 2015 endeavour prawn CPUE was slightly higher than the previous five year average. In contrast, the 2014 endeavour prawn CPUE was the lowest since 1989. Since 2010 the average annual endeavour prawn CPUE’s have been approximately half of the CPUE’s for the period of highest fishing effort. The higher than average endeavour prawn CPUE’s for 1995, 1999 and 2006 indicate years of good recruitment for this species.

Table 2 Summary of catch rates (CPUE) since 2010.

Year	All Prawn			Tiger Prawn (CPUE kg/d)	Endeavour Prawn (CPUE
2010	252	187	61		
2011	221	160	58		
2012	254	195	59		
2013	269	215	56		
2014	207	165	41		
2015	256	194	58		
Average (2010-2014)				241	185 55
Average (1991-2001)				191	70 115

Ideally “catch rates” (CPUE) is an indication of the numbers of prawns on the seabed. High CPUE indicates a large prawn biomass while low CPUE indicates a small prawn biomass. There are, however, many other factors that can impact on the CPUE of an individual vessel other than prawn abundance. These factors are vessel size, engine power, type of nets, time of the year, moon phase, area within the fishery, fisher experience etc. The standardised CPUE used in the stock assessment models are slightly different to those shown in Figure 5 as they are adjusted for the factors that can affect individual vessel catch rates. This ensures that the catch rates can more accurately reflect the biomass of prawns on the seabed.

The increase in tiger prawn CPUE since 2000 is most likely due to the combined effect of fishers targeting tiger prawn in preference to endeavour prawn and the higher abundance of tiger prawn due to the decrease in fishing effort. This is supported by stock assessment results which indicate that the tiger prawn biomass was increasing during 2002-06, was at a higher level than during the 1990s and was above Bmsy (The biomass that supports Maximum Sustainable Yield (MSY)).

During the years 2010-14 fishing effort was approximately a quarter of the Emsy based TAE of 9,200 days and the average effort for the years 1991-2001. The tiger prawn harvest was around 50% of the high effort years (1991-01) and the estimate of Maximum Sustainable Yield (MSY). Tiger prawn catch rates (CPUE) since 2010, however, were the highest recorded since 1989 (Figure 3). These high CPUE’s combined with the low harvest of tiger prawns in recent years suggests that the tiger prawn stock is still well above the Biomass associated with MSY (Bmsy) sustainability reference point.

Due to the very low level of effort in the fishery and fishers targeting the higher value tiger prawn, the monthly CPUE of endeavour prawns can be easily biased by which vessels are fishing and where they are fishing; therefore the current CPUE indices for endeavour prawn are a poor index of the stock biomass. The

below average endeavour prawn catch rates since 2009 (Figure 5) most likely reflect fishers focusing on the higher value tiger prawns. Since 2001 the endeavour prawn catch has dropped to approximately 10% of historic levels and the estimate of MSY (Table 1). Therefore the impact of fishing (fishing mortality) on the endeavour prawn stock has been quite low compared with the 1990s when fishing mortality was much higher due to fishers targeting endeavour prawns, more vessels and much higher fishing effort. There is nothing to indicate that the endeavour stock has been overfished. This species is more resilient to high fishing effort than tiger prawns and in the early years of this fishery the endeavour prawn stock appeared to increase with increased fishing effort.

Spatial distribution of fishing effort and catches

The spatial distribution of fishing effort and catches, summarised to the 6 minute grid level are presented for the 2005, 2014 and 2015 fishing seasons in Figure 6 and Figure

7. To abide with logbook confidentiality requirements the data for grids where less than five vessels fished during the season are not shown. Because the Fisheries Jurisdiction

Line passes through the lower sections of some grids along the border region the catch of these grids 'appear' to be in PNG waters as the grid centre is north of the line.

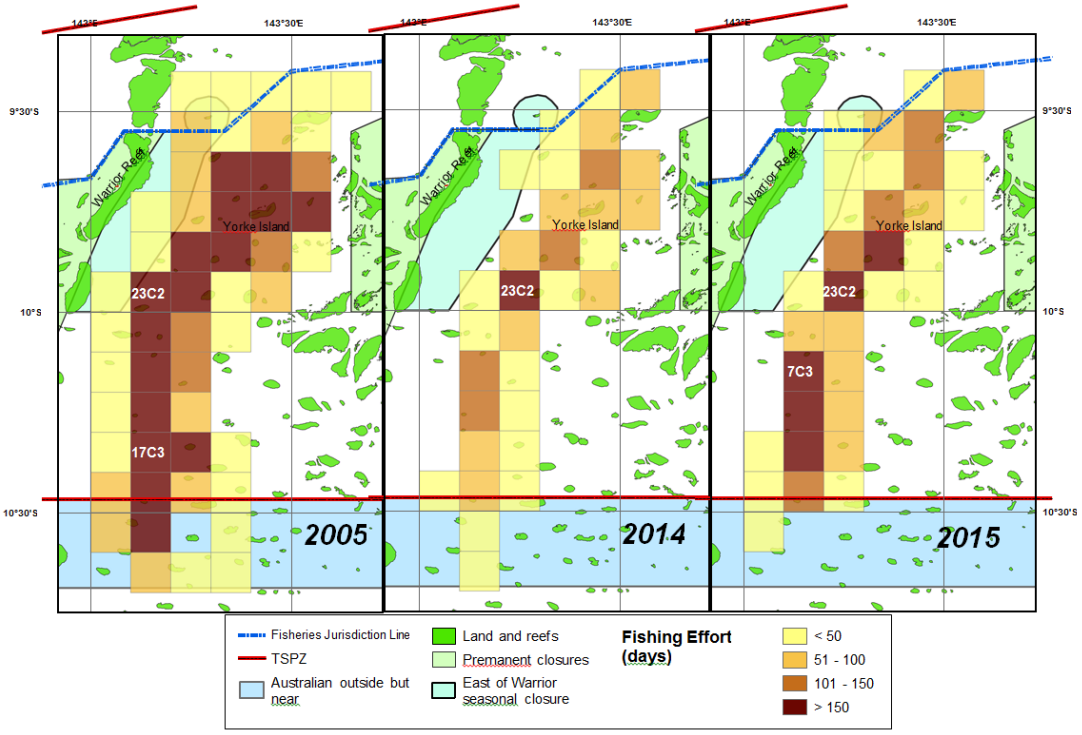


Figure 6 Effort distribution (fishing days) within the TSPF for the 2005, 2014 and 2015 fishing seasons by 6- minute grid.

The 2005 fishing season was chosen as a base year for comparison with the two most recent fishing seasons, because this was the year of the pro rata effort reduction for the fishery to a 9,200 day cap. Also, the 2005 fishing effort (5,966 days) was approximately 60% of the years of highest effort (1991-2001) and the 2005 tiger prawn catch (651t) was just below the 1991-01 average (659t) and the estimate of MSY (676t).

There were 16 grids where fishing effort was above 150 days during the 2005 fishing season (Figure 6). In contrast there was only one grid (23C2) where fishing effort was greater than 150 days during 2014. This grid also had the largest prawn catch for the 2014 fishing season and was fished by only 19 vessels using 222 days effort and produced 46t of tiger prawn but only 8t of endeavour prawn (Figure 7). In contrast, during the 2005 season the same grid was fished by 52 vessels and 350 days of effort, had a lower tiger prawn catch of 35t but a much higher endeavour prawn catch (40t). The grid with the highest effort and catch in 2005 was 17C3 where 407 days of effort from 53 vessels produced 39t of tiger prawn, 47t of endeavour prawn and 2.3t of king prawn.

In contrast to 2014 there were five grids with effort greater than 150 days during the 2015 season. These grids match with 2005 grids that had greater than 150 days of effort. Based on the 2015 logbook data available in late December grid 23C2 was again the grid with the highest effort and catch; 19 vessels, 266 effort days, 52t tiger prawn and 17t of endeavour prawn. The grid with the second highest effort and catches was 7C3; 21 vessels, 212 effort days, 51t tiger prawn and 11t of endeavour prawn. These estimates of effort and catch for 2015 could change slightly when all of the logbook data is available.

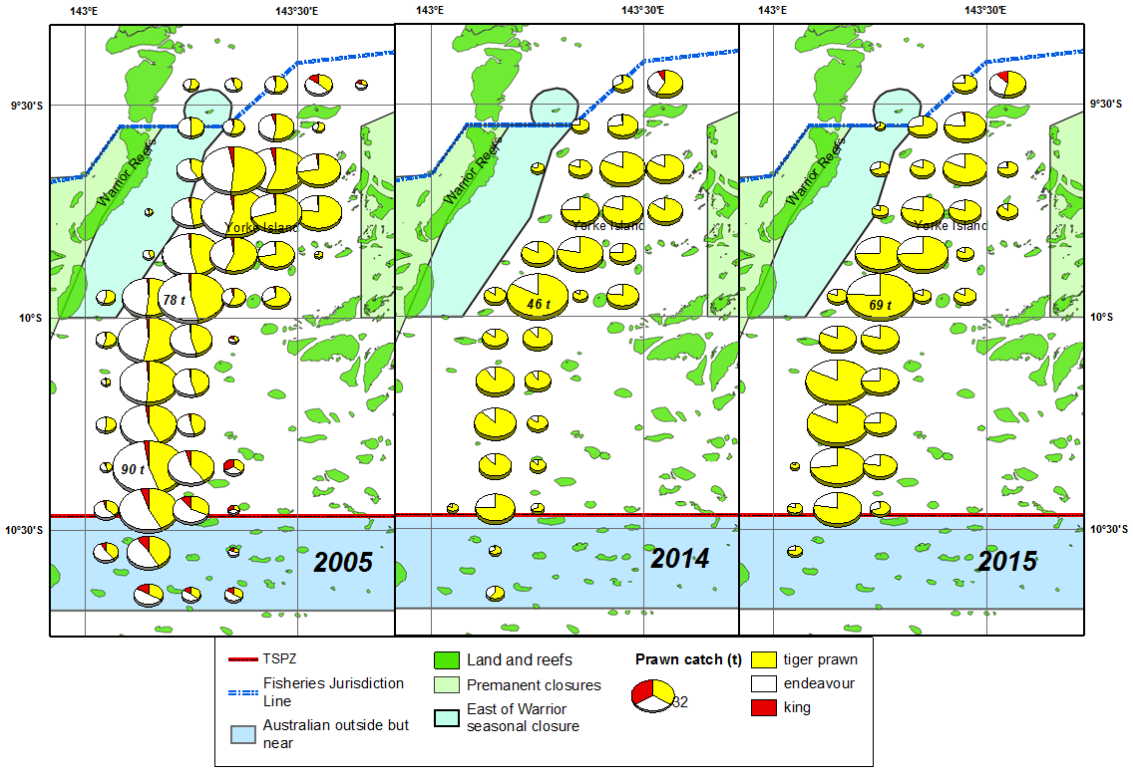


Figure 7 Spatial distribution of catch during the 2005, 2014 and 2015 fishing seasons. The diameters of the pie charts are scaled by the total prawn catch for each grid. The grids with the highest prawn catch in each fishing season are labelled with the total. NB – the appearance of catches in closure areas east of warrior reef occurred during the times these areas were open to fishing.

Although the 2005 pie graphs indicates that the proportion of endeavour prawn was slightly higher in the southern half of the fishery (Figure 7), the pie graph for 2014 shows that the reduction in the proportion of endeavour prawn in catches after 2005 occurred over the whole fishery. Similarly the slight increase between 2014 and 2015 occurred in all areas.

Monthly trends in catch and effort

The following figures compare the monthly trends for the last two seasons with the average of the years 1989-13. The range markers on the "average line" indicate the minimum and maximum values that occurred in each month from 1989 to 2013.

The 2015 fishing effort (Figure 8) was higher than 2014 and 2013 (see last year's handbook) for the months of April through to September and the estimates for October and November could increase as more logbook records are entered for those months. The small difference between the "VMS" and "Nights Fished" lines indicate good coverage of the fishing effort by the logbook records up to August and that only a small percentage of records are still to be entered for the last three months of 2015. Generally the highest effort is at the start of the season and tracks downward over the season, following the monthly trend in prawn catch rates. The 2015 pattern of fishing effort doesn't follow the average trend as the highest effort levels were in May followed by August.

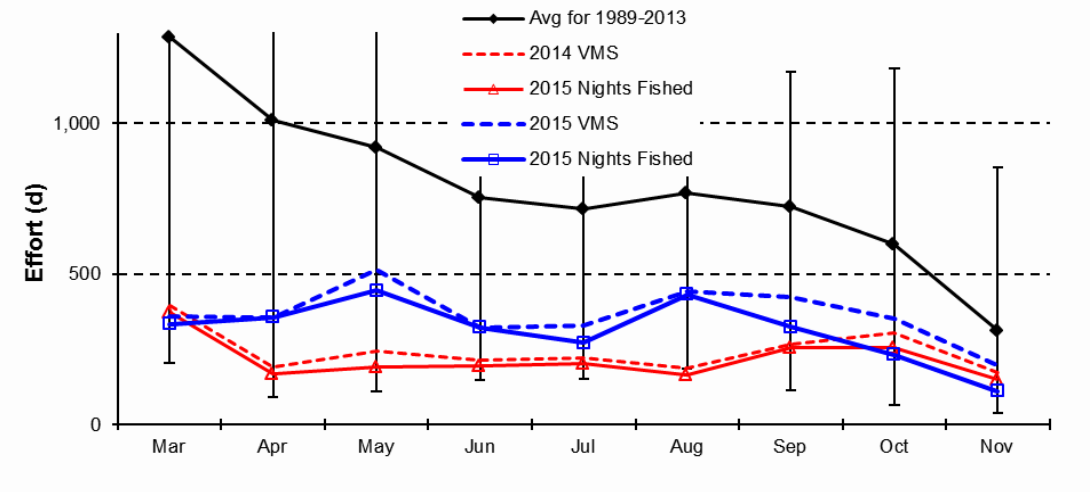


Figure 8 Monthly fishing effort in days. The blue solid and dotted lines show the 2015 VMS and logbook measures of monthly effort and the red lines show the 2014 fishing effort.

The 2015 tiger prawn catches (Figure 9) were below average in March but close to the average for the rest of the season. The highest tiger prawn catch was in May and the August catch was higher than the adjacent months. These catches reflect the pattern of fishing effort. The March 2015 tiger prawn catch rate (CPUE) was the highest recorded to date. The remaining 2015 months through to September were higher than the 2014 corresponding months.

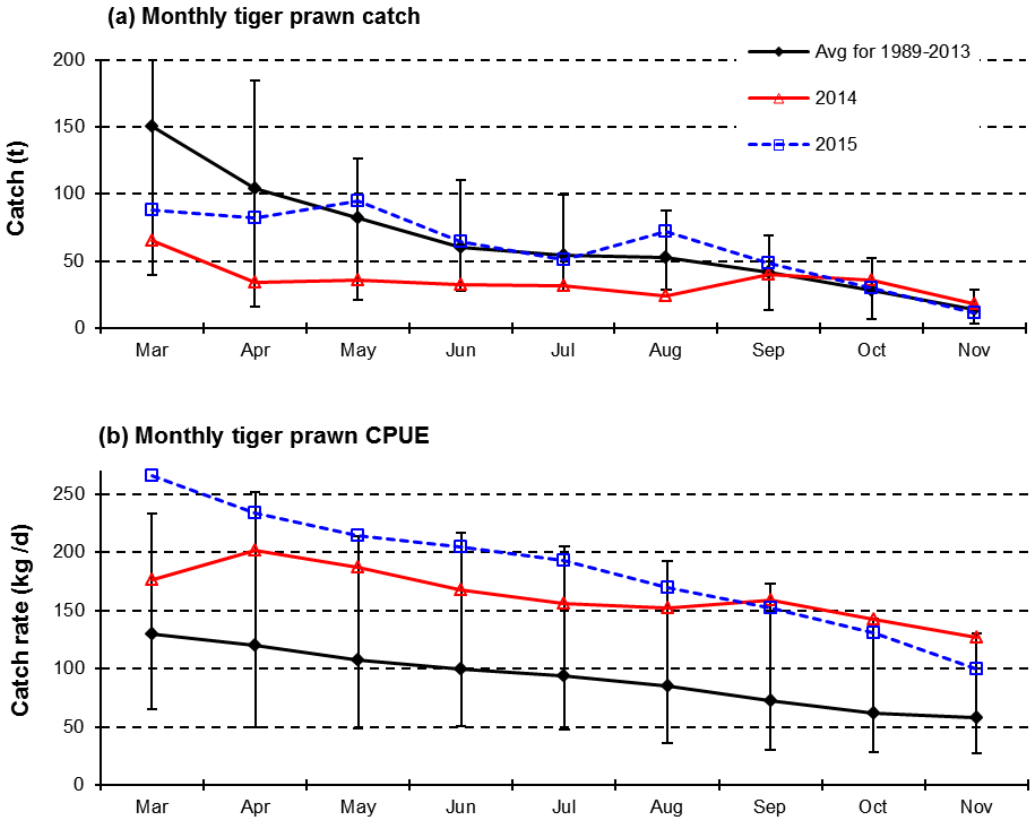


Figure 9 Monthly tiger prawn catches and catch rates (CPUE)

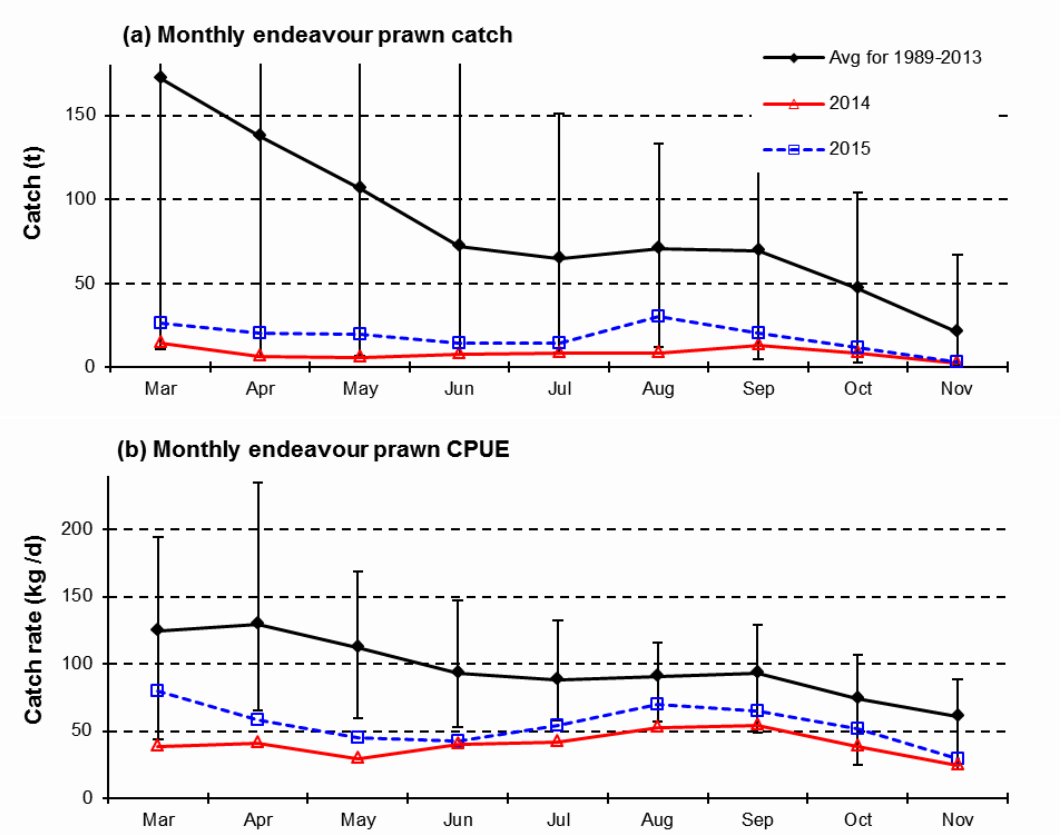


Figure 10 Monthly endeavour prawn catches and catch rates (CPUE).

The monthly catches of endeavour prawns in 2015 were higher than for the corresponding months in 2014 (Figure 10) reflecting the slightly higher monthly catch rates and increased monthly fishing effort (Figure 8) during the 2015 season.

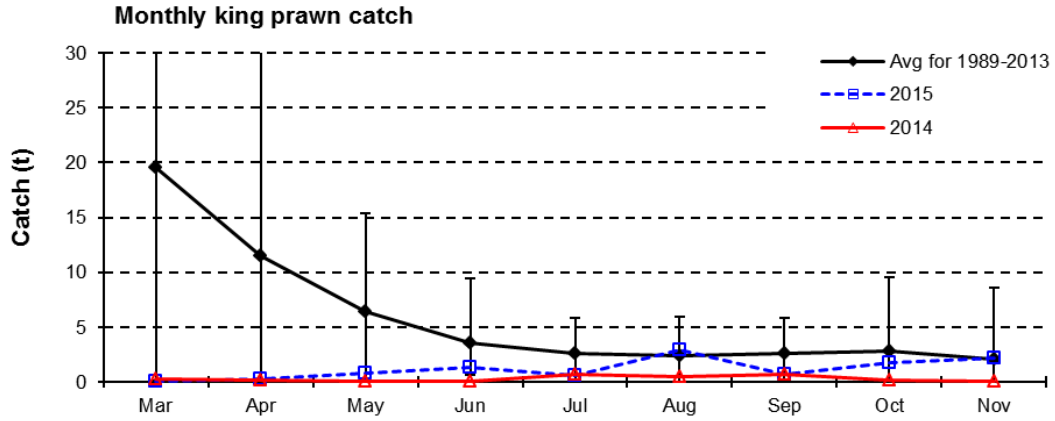


Figure 11 Monthly king prawn catches.

The 2015 monthly king prawn catches were well below average except for August and the last two months of the season. The 2014 (Figure 11) and 2013 monthly king prawn catches (see last year's handbook) were well below average throughout the whole season reflecting the low levels of effort. In past years when effort was higher most of the king prawn catch came from the first two months of the season.

Details by month of catches and effort since 1989

For fishers interested in more detail than that presented in the graphs the tables below provide a summary of catch and effort for each month of each year since 1989.

Note: Only the southern section of Torres Strait was open during March of 1989 so this data was neither presented nor used to calculate the averages displayed in the previous monthly figures.

Table 3 Tiger prawn catch in tonnes by month and year.

Year	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Mar	13*		217	245	90	124	187	246	172	261	129	121	133	195	177	141	194	191	117	87	90	63	39	84	100	65	88
Apr	169	99	67	147	87	87	120	90	109	185	89	74	124	141	134	111	165	117	126	81	51	43	16	69	56	34	82
May	126	76	117	102	64	64	107	68	92	117	96	52	88	112	79	80	96	79	111	71	44	32	21	71	60	36	95
Jun	64	41	110	87	40	51	73	71	59	108	74	61	75	57	61	61	51	45	59	37	45	31	28	54	47	32	65
Jul	60	66	56	62	51	42	53	58	53	99	76	59	64	46	77	65	31	45	40	51	28	31	32	52	49	31	51
Aug	43	46	42	87	72	41	45	57	74	77	62	42	56	54	74	67	34	49	46	46	28	58	38	32	35	24	72
Sep	30	34	49	67	37	26	36	40	69	60	49	36	48	48	54	44	42	38	40	29	30	52	20	14	30	40	48
Oct	25	22	31	52	30	20	20	29	43	43	35	23	24	44	36	22	28	28	31	23	25	23	7	15	27	36	30
Nov	9	11	20	29	16	10	9	10	23	15	18	10	10	24	20	16	10	11	12	13	7	11	3	9	15	18	11

Table 4 Endeavour prawn catch in tonnes by month and year.

Year	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Mar	32*		293	222	172	202	279	241	236	190	263	279	290	225	165	116	117	187	125	87	47	20	11	15	33	14	26
Apr	135	64	81	160	148	215	222	141	189	165	308	200	227	174	163	129	124	178	113	93	31	14	6	21	12	7	21
May	125	67	172	119	99	146	189	98	149	130	239	136	177	110	89	102	101	95	87	71	22	10	7	23	11	6	19
Jun	71	35	136	104	57	112	131	78	92	120	189	101	89	67	48	65	54	51	43	34	24	7	9	18	8	8	15
Jul	73	57	86	79	69	86	105	82	76	134	151	102	82	49	60	73	31	41	30	34	13	9	14	17	12	8	14
Aug	59	65	73	122	123	102	92	97	118	110	133	88	73	62	78	85	42	40	36	42	14	23	14	12	13	8	30
Sep	55	69	125	125	93	78	97	85	111	90	113	96	91	76	75	67	64	41	36	32	16	20	8	5	9	13	21
Oct	48	54	70	104	82	50	45	47	67	85	80	58	47	68	52	33	46	32	27	18	8	6	3	3	5	9	12
Nov	15	24	43	67	42	21	19	24	26	27	33	19	19	33	29	19	14	8	6	6	2	1	1	2	1	3	3

Table 5 King prawn catch in tonnes by month and year.

Year	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Mar	3*		30.0	20.3	12.0	13.2	9.6	9.6	6.3	29.4	19.3	33.8	27.6	75.5	48.0	26.2	11.8	15.7	16.7	16.1	5.7	2.4	0.5	0.2	0.3	0.3	0.1
Apr	5.7	5.3	5.5	8.0	7.0	10.9	6.3	5.9	7.3	24.6	13.2	18.2	14.3	45.1	26.0	16.1	13.6	12.3	12.0	11.9	3.7	1.6	0.2	0.8	0.2	0.2	0.3
May	6.2	6.6	8.8	5.2	5.4	8.3	6.1	2.7	4.4	13.7	6.3	6.1	6.2	15.4	15.2	8.1	9.9	6.2	5.9	4.8	1.8	1.1	0.2	0.4	0.1	0.1	0.8
Jun	3.2	2.7	5.9	5.6	2.8	3.8	2.8	1.4	3.1	9.5	4.1	4.3	2.6	4.5	7.2	4.7	4.6	2.6	3.1	2.2	2.2	0.7	1.0	1.2	0.1	0.1	1.4
Jul	1.7	3.2	4.4	2.5	3.5	2.3	2.7	1.3	1.5	5.8	3.6	3.8	1.3	2.6	5.0	3.8	1.4	2.0	2.2	4.9	1.2	0.4	1.2	0.2	0.8	0.8	0.6
Aug	1.4	2.0	3.3	3.3	4.7	2.1	1.2	0.9	2.9	6.0	3.0	2.0	1.6	2.1	4.3	4.0	2.1	2.5	2.2	4.1	0.6	1.1	1.0	0.0	0.5	0.5	2.9
Sep	1.5	1.5	4.5	4.3	1.3	1.2	1.0	1.2	2.6	5.8	3.8	2.1	5.4	4.1	5.6	4.8	3.2	2.1	1.6	2.2	0.7	1.1	0.1	0.2	0.7	0.7	0.7
Oct	1.7	0.8	4.6	2.9	1.3	1.0	0.8	1.1	3.2	6.8	3.9	1.6	9.6	8.2	8.4	4.0	3.3	1.3	1.7	1.4	0.7	0.3	0.1	0.1	0.2	0.2	1.7
Nov	0.6	1.5	3.0	3.1	0.6	2.2	0.1	0.4	3.4	2.7	3.5	0.8	8.6	7.2	6.2	2.6	0.8	0.5	1.3	0.6	0.1	0.2	0.2	0.0	0.1	0.1	2.2

Table 6 Number of nights recorded as fished in Torres Strait by the fleet.

Year	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Mar	184*		2,431	2,218	1,115	1,570	1,610	1,709	1,672	1,694	1,387	1,892	1,835	1,916	1,797	1,123	1,129	1,145	1,023	534	488	321	204	365	411	371	333
Apr	1,370	910	596	1,453	1,076	1,494	1,249	1,080	1,488	1,371	1,332	1,506	1,565	1,506	1,573	1,107	1,184	878	871	535	300	223	92	276	222	168	357
May	1,605	1,005	1,228	1,377	1,016	1,160	1,147	882	1,306	1,126	1,479	1,101	1,365	1,445	1,066	844	914	578	703	532	238	172	112	335	245	193	445
Jun	1,062	509	1,531	1,358	645	956	970	877	1,092	1,099	1,505	1,061	1,206	864	620	675	606	358	442	341	284	149	167	275	185	194	322
Jul	1,064	867	1,030	1,084	794	921	868	918	853	1,199	1,335	1,154	1,063	715	765	788	386	316	342	370	193	153	204	294	238	203	271
Aug	812	812	734	1,209	1,440	1,161	842	1,078	1,209	1,104	1,252	934	1,056	851	930	984	432	356	425	414	197	307	253	220	186	165	433
Sep	744	724	1,046	1,170	949	887	763	833	1,157	1,051	1,148	1,098	1,082	970	1,007	802	583	361	432	291	202	309	170	116	197	255	324
Oct	670	543	856	1,184	933	734	488	736	853	1,031	964	835	700	908	794	447	547	304	409	271	204	163	67	122	181	256	233
Nov	282	318	531	854	557	361	221	340	467	507	502	398	285	466	448	271	185	111	185	165	59	82	40	78	128	149	112


Australian Government
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2016 AFMA Moon Calendar
JANUARY
Mo Tu We Th Fr Sa Su
1 2 3
4 5 6 7 8 9 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30 31
FEBRUARY
Mo Tu We Th Fr Sa Su
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29
MARCH
Mo Tu We Th Fr Sa Su
1 2 3 4 5 6
7 8 9 10 11 12 13
14 15 16 17 18 19 20
21 22 23 24 25 26 27
28 29 30 31
APRIL
Mo Tu We Th Fr Sa Su
1 2 3
4 5 6 7 8 9 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30
MAY
Mo Tu We Th Fr Sa Su
30 31 1
2 3 4 5 6 7 8
9 10 11 12 13 14 15
16 17 18 19 20 21 22
23 24 25 26 27 28 29
JUNE
Mo Tu We Th Fr Sa Su
1 2 3 4 5
6 7 8 9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30
JULY
Mo Tu We Th Fr Sa Su
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4 5 6 7 8 9 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30 31
AUGUST
Mo Tu We Th Fr Sa Su
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30 31
SEPTEMBER
Mo Tu We Th Fr Sa Su
1 2 3 4
5 6 7 8 9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30
OCTOBER
Mo Tu We Th Fr Sa Su
31 1 2
3 4 5 6 7 8 9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30
NOVEMBER
Mo Tu We Th Fr Sa Su
1 2 3 4 5 6
7 8 9 10 11 12 13
14 15 16 17 18 19 20
21 22 23 24 25 26 27
28 29 30
DECEMBER
Mo Tu We Th Fr Sa Su
1 2 3 4
5 6 7 8 9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30 31
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