

## South Australian Charter Boat Fishery Data Summary



Rogers, P. J, Tsolos, A., Boyle, M.K. and Steer, M.

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SARDI Aquatic Sciences  
PO Box 120 Henley Beach SA 5022

November 2017

Final Report to PIRSA Fisheries and Aquaculture

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## EXECUTIVE SUMMARY

This report summarises the nominal catch, activity and client dynamics data for the South Australian Charter Boat Fishery (SACBF) during the financial years of 2007/08 to 2016/17. Nominal catch data were aggregated across operators to provide annual time series for key species.

There were 100 licences in the SACBF in 2016/17, of which 59% were active. Trip days and number of clients participating in the fishery declined by 34% between 2007/08 and 2016/17. Seasonal patterns in mean number of clients and trip days indicated that the highest periods of activity are from December to April.

In 2016/17, the overall number of fish of all species taken in the SACBF decreased by 22% from the previous year.

In 2016/17, a total of 89% of the catch composition across the fishery consisted of King George Whiting (KGW) (39%), Snapper (17%), Bight Redfish (10%), Silver Trevally (5%), Snook (4%), Australian Salmon (4%), Southern Calamari (3%), Southern Bluefin Tuna (SBT) (2%), Garfish (2%), and Blue Crab (2%), with the remaining 11% comprising 24 other species.

Nominal catches of KGW ranged between 29,469 and 54,563 fish across the annual time series.

The total number of KGW less than the legal minimum length (LML) that were released annually ranged between 2,202 and 8,848 fish; 5,232 fish smaller than the LML were released in 2016/17. Percentage of the nominal catch of KGW retained, remained high and relatively stable (85 – 93%) across all years.

Annual nominal catches of Snapper ranged between 14,946 and 34,450 fish; 10,319 fish smaller than the LML were released in 2016/17. Percentage of the nominal catch retained, remained relatively stable across years at 59 – 71%.

**Keywords: Recreational, tourism, technology, composition, clients.**

## INTRODUCTION

This report provides a summary of compulsory logbook data collected by the South Australian Charter Boat Fishery (SACBF). It updates information provided in the previous reports of Tsolos and Boyle (2016) and Steer and Tsolos (2016). The SACBF is a commercial operation that provides recreational fishers access to the State's fisheries resources, through the provision of purpose-built vessels, experienced operators and sophisticated technology. The fishery commenced operations in July 2005 and is managed by PIRSA Fisheries and Aquaculture under provisions of the *Fisheries Management (Charter Boat Fishery) Regulations 2016* (<https://www.legislation.sa.gov.au>); *South Australian Fisheries Management Act 2007*.

The value of the SACBF has been conservatively estimated at \$4.7 M (GVP 2013/14) (EconSearch 2015; Steer and Tsolos 2016). The fishery can operate in all coastal waters including the gulfs and bays from the South Australian - Western Australian to the South Australian-Victorian State borders. The primary target species include Snapper (*Chrysophrys auratus*), King George Whiting (KGW) (*Sillaginodes punctatus*), Bight Redfish (*Centroberyx gerrardi*), Australian Salmon (*Arripis truttacea*), Snook (*Sphyræna novaehollandiæ*), Silver Trevally (*Pseudocaranx dentex*) and Southern Calamari (*Sepia australis*). Southern Bluefin Tuna (SBT) (*Thunnus maccoyii*) have been increasingly important in catches in some regions during recent years (Steer and Tsolos 2016).

## OBJECTIVE

This report summarises annual trends in client dynamics, fishing activity, catch composition and the spatial and temporal patterns of nominal catches in the SACBF between 2007/08 and 2016/17.

## **METHODS**

### **Catch statistics**

Charter Boat operators are required to log their daily fishing activities, including specific details of the type of fishing activity, area of operation, number of clients, fishing time, gear used, targeted species and number of individuals retained (nominal catch). Additional information is collected for KGW and Snapper, including the number of released legal and undersize fish, and the estimated combined weight. These data must be submitted to SARDI Aquatic Sciences within 15 days of the end of the month.

Metrics used in this report include the nominal catch or counts of individuals of each species retained by fishing activity type by region/gear, counts of individuals of each species released (< or > Legal Minimum Length, LML), and estimated weights for KGW and Snapper.

### **Spatial structure of the fishery**

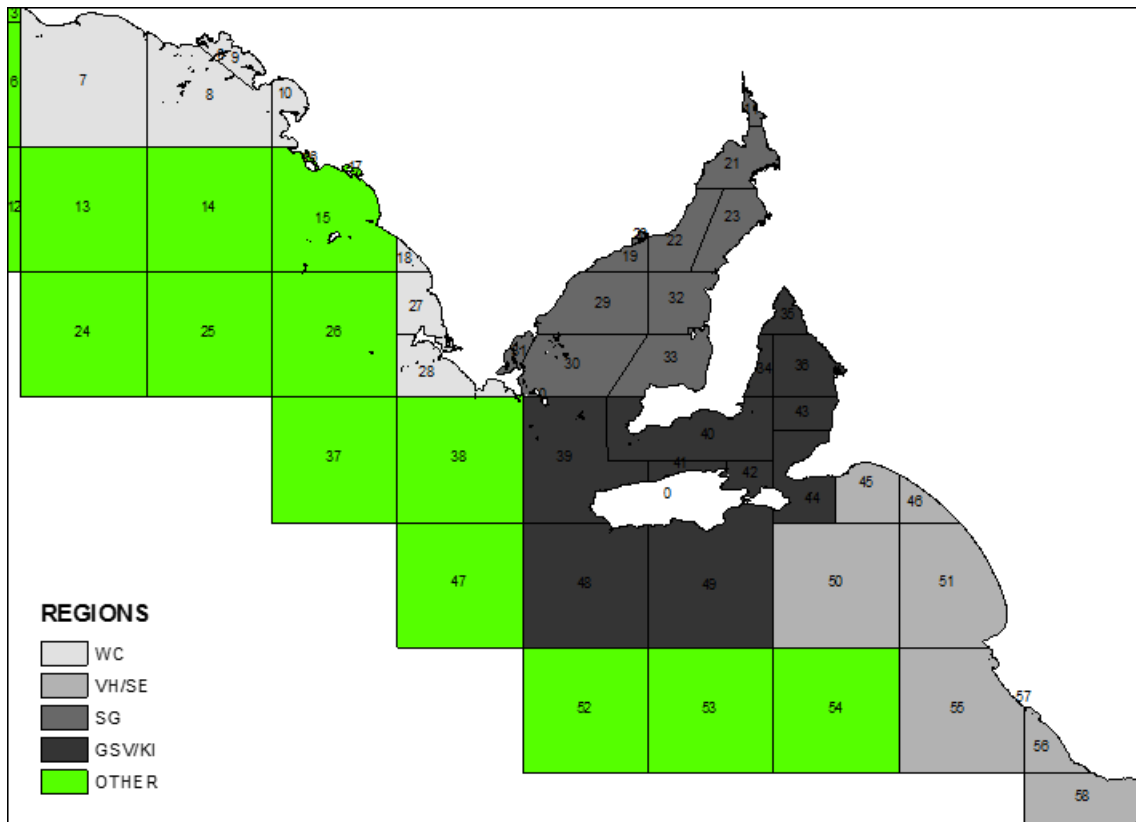
South Australian State waters are divided into Marine Fishing Areas (MFAs) against which fishing activities are reported (Fig. 1). Catch data were aggregated across the SACBF operators to provide annual totals by financial year at the State and regional level for key species.

The MFAs are amalgamated into five regions. These include the West Coast, Spencer Gulf/Coffin Bay, Gulf St. Vincent/Kangaroo Island, Victor Harbor/South East, and 'Other'. The latter region is approximated by the area of the eastern and central Great Australian Bight (GAB) from near Cape Catastrophe, Eyre Peninsula out to the continental shelf slope to the South Australian - Western Australian border, and offshore areas to the south of Kangaroo Island (Fig. 1).

### **Quality assurance of data**

Validation of the SACBF logbook data includes cross-checking and code-driven queries that are activated during entry of data and reporting phases (Steer and Tsolos 2016). Regular random checks of current and historic data are carried out as standard procedure. Extracted catch and effort data were aggregated and graphed by their various spatial/temporal/effort categories and cross-checked against previous reports (Tsolos and Boyle 2015).





**Figure 1.** The South Australian Charter Boat Fishery amalgamated fishing regions.

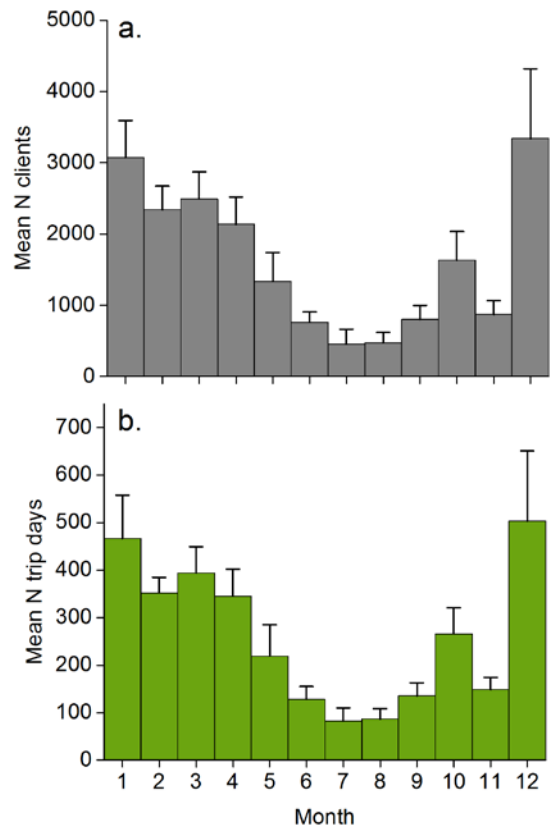
## RESULTS

### Fishery activity patterns

The number of licences in the SACBF ranged from 105 – 109 between 2007/08 and 2013/14, and declined to 100 licences in 2016/17 (Table 1). The number of active licences in the fishery ranged from 77 – 79 between 2007/08 and 2011/12, and decreased to 59 in 2016/17. Trip days decreased by 34% from 3,640 in 2007/08 to 2,392 days in 2016/17 (Table 1). Over the same period, the number of clients participating in the fishery declined from 21,960 to 14,459, representing a 34% reduction. Seasonal patterns in mean number of clients and trip days show the summer and autumn months from December to April are consistently the highest periods of activity in the fishery (Fig. 2). A peak also occurred in October, which may partly reflect fishing effort directed at Snapper prior to the state-wide seasonal closure (mid-day 1 November to mid-day 15 December).

**Table 1.** Activity patterns and client participation in the fishery between 2007/08 and 2016/17.

| Financial year | No. of clients | Trip days | Licences | Active licences |
|----------------|----------------|-----------|----------|-----------------|
| 2007/08        | 21,960         | 3,640     | 108      | 78              |
| 2008/09        | 21,431         | 3,561     | 108      | 79              |
| 2009/10        | 21,846         | 3,552     | 109      | 77              |
| 2010/11        | 20,095         | 3,322     | 109      | 77              |
| 2011/12        | 23,710         | 3,566     | 109      | 77              |
| 2012/13        | 23,532         | 3,391     | 109      | 75              |
| 2013/14        | 19,227         | 2,830     | 105      | 74              |
| 2014/15        | 15,136         | 2,389     | 105      | 61              |
| 2015/16        | 15,611         | 2,602     | 102      | 61              |
| 2016/17        | 14,459         | 2,392     | 100      | 59              |



**Figure 2.** Monthly mean ( $\pm$  s.d.) number (N) of (a) charter clients and (b) trip days between 2007/08 and 2016/17.

### Species composition of catches

The overall number of individual fish of all species caught by clients in the SACBF in 2016/17 was 86,458 fish, which was 22% less than the previous year ( $n_{2015/16} = 98,001$ ) (Table 2). Ten of the 34 species taken in fishery accounted for the majority (89%) of the nominal catch in 2016/17 (Table 2). Nominal catches of KGW ( $n = 34,125$ ; 39%), Snapper ( $n = 14,946$ ; 17%), Bight Redfish ( $n = 8,970$ ; 10%), Silver Trevally ( $n = 3,933$ ; 5%), Snook ( $n = 3,841$ ; 4%), Australian Salmon ( $n = 3,566$ ; 4%), Southern Calamari ( $n = 2,364$ ; 3%), SBT ( $n = 1,866$ ; 2%), Garfish ( $n = 1,620$ ; 2%) and Blue Crab ( $n = 1,514$ ; 2%) supported the SACBF (Table 2). The remaining 11% of the annual nominal total catch comprised 24 species.

Annual catches of KGW ranged between 29,469 and 54,563 individual fish across the entire annual time series (Table 2); this range equated to approximately 9.6 – 19.1 t (Table 3). Number of undersize KGW (i.e. < legal minimum length, LML) released annually ranged between 2,202 and 8,848 fish. KGW LML = 30 cm (E of 136° E) and 32 cm (W of 136° E) and Snapper LML = 38 cm. A total of 5,232 undersize KGW were released in 2016/17 (Table 3). The proportion of legal KGW retained remained high and relatively stable (85 – 93%) across all years (Fig 3a).

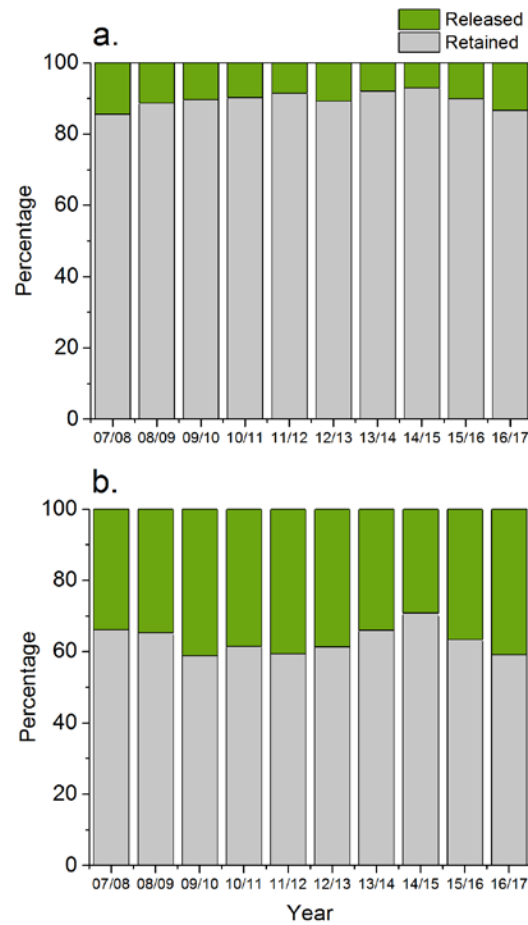
Annual nominal catches of Snapper ranged between 14,946 – 34,450 (Table 2), which equated to an estimated range of approximately 43.6 – 92.9 t (Table 3). The number of undersize Snapper released annually ranged between 8,273 and 22,269 fish across the entire annual time series. A total of 10,319 undersize Snapper were released in 2016/17 (Table 3). The proportion of the catch of legal size Snapper that were retained remained relatively stable across all years at 59 – 71% (Fig 3b).

**Table 2.** Species harvested and number of individuals retained (nominal catch) by financial year. Annual species totals are formatted conditionally by the graduated dark green colours from highest to lowest. Confidential data representing <5 licences are blanked with light green blocks. Bolded values are annual totals.

| Species             | 07/08          | 08/09          | 09/10          | 10/11          | 11/12          | 12/13          | 13/14          | 14/15         | 15/16         | 16/17         |
|---------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|---------------|---------------|---------------|
| KGW                 | 52,531         | 54,563         | 49,788         | 54,327         | 54,563         | 42,289         | 35,526         | 29,469        | 35,356        | 34,125        |
| Snapper             | 34,450         | 30,830         | 31,828         | 28,562         | 28,865         | 25,569         | 22,233         | 20,071        | 16,784        | 14,946        |
| Bight Redfish       | 14,903         | 15,624         | 17,872         | 14,034         | 16,922         | 17,397         | 14,454         | 11,746        | 12,462        | 8,970         |
| Silver Trevally     | 3,796          | 3,465          | 4,693          | 5,479          | 4,529          | 4,540          | 3,700          | 4,466         | 5,210         | 3,933         |
| Snook               | 5,376          | 3,406          | 4,260          | 5,280          | 4,861          | 3,575          | 1,726          | 2,501         | 2,340         | 3,841         |
| Aust. Salmon        | 6,732          | 7,051          | 6,075          | 1,954          | 4,815          | 5,694          | 7,112          | 4,556         | 5,657         | 3,566         |
| S. Calamari         | 2,137          | 2,244          | 3,348          | 2,307          | 7,401          | 6,571          | 4,572          | 3,167         | 2,816         | 2,364         |
| SBT                 | 554            | 736            | 1,035          | 1,144          | 1,552          | 1,739          | 1,824          | 2,320         | 2,393         | 1,866         |
| Garfish             | 1,365          | 6,259          | 6,327          | 6,710          | 7,117          | 2,310          | 4,450          | 3,958         | 3,143         | 1,620         |
| Blue Crab           | 1,424          | 1,497          | 1,383          | 761            | 1,112          | 677            | 1,018          | 434           | 1,612         | 1,514         |
| Swallowtail         | 4,930          | 6,509          | 5,952          | 5,306          | 6,971          | 7,919          | 3,766          | 2,795         | 1,916         | 1,372         |
| Leatherjacket spp.  | 1,932          | 1,969          | 1,850          | 1,711          | 2,342          | 2,016          | 1,901          | 973           | 1,155         | 1,107         |
| Red Mullet          | 2,373          | 2,059          | 1,770          | 1,263          | 888            | 1,270          | 1,367          | 913           | 1,053         | 972           |
| School Whiting      |                | 580            |                | 178            |                |                |                |               |               |               |
| Sweep               | 2,177          | 3,449          | 2,809          | 2,202          | 2,758          | 2,420          | 2,418          | 1,272         | 931           | 956           |
| Australian Herring  | 2,718          | 2,864          | 3,240          | 1,658          | 1,259          | 2,120          | 2,312          | 2,050         | 1,314         | 923           |
| Flathead spp.       | 1,120          | 1,260          | 930            | 657            | 766            | 531            | 420            | 400           | 431           | 749           |
| Wrasse spp.         | 608            | 717            | 1,059          | 584            | 830            | 949            | 632            | 638           | 667           | 716           |
| Morwong             | 686            | 576            | 637            | 574            | 747            | 780            | 550            | 571           | 708           | 452           |
| 'Other' species     | 418            | 463            | 435            | 447            | 504            | 1,321          | 1,490          | 1,125         | 582           | 369           |
| Gummy Shark         | 248            | 292            | 460            | 293            | 453            | 656            | 446            | 556           | 413           | 316           |
| Razorfish           |                |                |                |                |                |                |                |               |               |               |
| Yellowtail Kingfish | 118            | 55             | 115            | 121            | 142            | 224            | 132            | 139           | 229           | 138           |
| Blue Mackerel       | 212            |                | 1,118          | 271            | 1,633          | 470            |                |               |               |               |
| S. Rock Lobster     | 23             | 48             | 55             |                |                | 40             | 40             | 100           |               | 84            |
| Blue Morwong        | 101            |                | 86             | 61             |                | 37             | 45             | 66            |               | 83            |
| School Shark        | 83             | 76             | 93             | 45             | 133            | 101            | 256            | 119           | 83            | 79            |
| Ling                | 43             | 48             |                | 17             |                |                |                |               |               | 41            |
| Samsonfish          | 97             | 71             | 144            | 107            | 168            | 242            | 110            | 92            | 144           | 30            |
| Albacore            |                |                | 18             | 60             |                |                |                |               |               |               |
| W. Blue Groper      | 101            | 49             | 81             | 73             | 40             | 27             | 45             | 30            |               | 18            |
| Weedy whiting       | 47             |                |                |                |                |                |                |               |               |               |
| Bronze Whaler       | 39             | 11             | 23             | 14             | 7              | 15             |                |               |               | 13            |
| Barracouta          | 225            | 183            | 151            |                |                | 0              | 0              |               |               |               |
| Cuttlefish spp.     | 34             | 25             | 26             | 44             | 23             | 66             |                |               |               |               |
| Striped Trumpeter   | 85             |                |                |                |                | 0              |                |               |               |               |
| <b>Totals</b>       | <b>143,276</b> | <b>147,991</b> | <b>147,984</b> | <b>136,611</b> | <b>153,468</b> | <b>132,721</b> | <b>113,842</b> | <b>94,891</b> | <b>98,001</b> | <b>86,458</b> |

**Table 3.** King George Whiting and Snapper captured and retained (estimated weight) and numbers released relative to legal minimum length (LML) regulations between 2007/08 and 2016/17. KGW LML = 30 cm (E of 136° E) and 32 cm (W of 136° E) and Snapper LML = 38 cm.

| Species and metric        | 07/08  | 08/09  | 09/10  | 10/11  | 11/12  | 12/13  | 13/14  | 14/15 | 15/16 | 16/17  |
|---------------------------|--------|--------|--------|--------|--------|--------|--------|-------|-------|--------|
| KGW                       |        |        |        |        |        |        |        |       |       |        |
| Estimated wt retained (t) | 18.6   | 19.1   | 17.9   | 18.2   | 18.1   | 13.9   | 11.7   | 9.6   | 12.3  | 11.6   |
| > LML released (count)    | 1,170  | 867    | 613    | 780    | 499    | 649    | 472    | 246   | 434   | 543    |
| < LML released (count)    | 8,848  | 6,899  | 5,697  | 5,857  | 5,070  | 5,085  | 3,079  | 2,202 | 3,923 | 5,232  |
| Snapper                   |        |        |        |        |        |        |        |       |       |        |
| Estimated wt retained (t) | 90.5   | 86.7   | 92.9   | 84.1   | 77.4   | 71.4   | 59     | 52.3  | 47.3  | 43.6   |
| > LML released (count)    | 2,967  | 3,080  | 2,624  | 1,887  | 1,884  | 2,075  | 1,263  | 1,219 | 660   | 684    |
| < LML released (count)    | 17,603 | 16,341 | 22,269 | 17,861 | 19,690 | 16,133 | 11,415 | 8,273 | 9,649 | 10,319 |



**Figure 3.** Percentage of (a) King George Whiting and (b) Snapper retained and released (<LML) between 2007/08 and 2016/17. KGW LML = 30 cm (E of 136° E) and 32 cm (W of 136° E) and Snapper LML = 38 cm.

## **Regional patterns in annual catch**

### *Gulf St Vincent and Kangaroo Island*

Catch compositions mostly comprised of KGW, Snapper, Bight Redfish, Australian Salmon, and Silver Trevally in the Gulf St Vincent and Kangaroo Island region during 2016/17 (Table 4). Nominal catches of key species were lower in 2016/17 compared to 2015/16.

### *Spencer Gulf and Coffin Bay*

Catch compositions in the Spencer Gulf and Coffin Bay region adjacent to the eastern Great Australian Bight were dominated by KGW, Snapper, and Snook in 2016/17 (Table 5). Notably, the nominal catch of Southern Calamari had declined since 2011/12. Nominal catches of KGW and Snook increased in 2016/17 compared to during the previous financial year.

### *West Coast*

Nominal catches in West Coast region off Eyre Peninsula largely consisted of Bight Redfish, KGW, and Snapper (Table 6). All nominal catch data were confidential for this region during 2016/17.

### *Victor Harbor and South-east*

Catch compositions in the Victor Harbor and South-east regions largely comprised SBT, Snapper, and shark (Table 7). Notable changes over the last decade were reduced catches of benthic associated species and increased catches of SBT and shark species. Nominal catches of SBT peaked during the 2015/16 season.

### *Other*

Catch compositions in the 'Other' region were supported by Bight Redfish, KGW and SBT (Table 8). Nominal catch data were largely confidential for this region.

**Table 4.** Annual patterns in catch composition and fishing activities in Gulf St Vincent/Kangaroo Island region. Confidential data representing <5 licences are blanked with the light green blocks.

| Species       | Activity/Area | 07/08  | 08/09  | 09/10  | 10/11  | 11/12  | 12/13  | 13/14  | 14/15  | 15/16  | 16/17  |
|---------------|---------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Aust. Salmon  | Game          | 0      | 0      | 0      | 0      |        |        |        |        |        | 0      |
|               | Inshore       | 6,135  | 6,426  | 5,756  | 1,674  | 4,040  | 4,883  | 6,780  | 4,269  | 5,507  | 3,329  |
|               | Offshore      |        |        |        |        |        |        |        |        |        |        |
| Bight Redfish | Deepwater     | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
|               | Game          |        | 0      | 0      |        |        |        | 155    |        | 419    |        |
|               | Inshore       | 3,270  | 2,879  | 4,167  | 3,813  | 4,374  | 4,424  | 3,599  | 3,474  | 4,229  | 4,105  |
|               | Offshore      | 9,159  | 11,031 | 9,842  | 6,971  | 8,844  | 9,638  | 8,496  | 5,542  | 4,673  | 3,009  |
| Blue Crab     | Drop Net      |        |        |        |        | 0      | 0      |        | 0      | 0      |        |
|               | Inshore       | 436    |        |        |        |        | 0      |        |        | 1,086  | 1,182  |
| Garfish       | Drop Net      | 0      | 0      |        | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
|               | Inshore       | 803    | 1,638  | 3,223  | 2,689  | 1,213  | 937    | 3,263  | 2,059  | 793    | 1,273  |
| Gummy Shark   | Deepwater     | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |        | 0      |
|               | Game          |        | 0      | 0      | 0      |        |        |        |        |        |        |
|               | Inshore       | 156    | 195    | 329    | 175    | 269    | 387    | 307    | 309    | 228    | 165    |
|               | Offshore      | 51     | 60     | 62     | 34     | 52     | 144    | 47     | 70     | 66     | 34     |
| KGW           | Deepwater     | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |        | 0      |
|               | Game          |        |        | 0      |        |        |        |        |        |        |        |
|               | Inshore       | 30,902 | 33,638 | 27,959 | 28,315 | 20,930 | 18,110 | 15,133 | 12,514 | 17,451 | 14,614 |
|               | Offshore      | 414    | 823    | 616    | 704    | 769    | 382    | 641    | 743    | 776    | 632    |
| Samsonfish    | Game          | 0      | 0      | 0      | 0      |        |        | 0      | 0      | 0      | 0      |
|               | Inshore       |        |        |        |        |        |        |        |        | 15     |        |
|               | Offshore      |        | 28     | 118    |        | 117    | 171    | 90     |        | 22     |        |
| School Shark  | Game          | 0      | 0      | 0      | 0      | 0      | 0      | 0      |        |        | 0      |
|               | Inshore       | 32     | 43     | 56     | 18     | 87     | 25     | 184    | 18     | 21     | 15     |
|               | Offshore      | 39     |        |        |        |        | 25     |        |        |        |        |
| Snapper       | Game          | 0      |        |        |        |        |        |        |        | 103    |        |
|               | Inshore       | 9,774  | 9,040  | 9,492  | 9,470  | 11,513 | 12,934 | 12,908 | 10,095 | 9,830  | 9,234  |
|               | Lobster       |        | 0      |        |        |        | 0      | 0      |        | 0      | 0      |
|               | Offshore      | 4,077  | 4,887  | 3,362  | 1,620  | 1,662  | 1,734  | 1,647  | 1,146  | 1,255  | 932    |
| Snook         | Game          | 0      | 0      | 0      | 0      |        |        |        |        | 0      | 0      |
|               | Inshore       | 4,287  | 2,637  | 2,804  | 4,117  | 3,542  | 2,617  | 837    | 1,107  | 798    | 1,888  |
|               | Offshore      | 0      |        |        |        |        |        |        | 0      |        | 0      |
| SBT           | Game          |        |        | 118    | 185    | 488    | 478    | 539    | 592    | 426    | 275    |
|               | Inshore       |        |        |        | 0      | 304    | 458    | 323    | 617    | 538    | 419    |
|               | Offshore      |        | 125    | 463    |        |        | 257    | 311    | 361    | 532    | 438    |
| S. Calamari   | Drop Net      | 0      | 0      |        | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
|               | Game          | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |        | 0      |
|               | Inshore       | 1,450  | 756    | 1,768  | 816    | 1,316  | 1,644  | 1,841  | 840    | 630    | 721    |
|               | Offshore      |        |        |        |        |        |        |        |        |        |        |
| Trevally      | Drop Net      |        | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
|               | Deepwater     | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |        | 0      |
|               | Game          | 0      | 0      | 0      |        |        |        |        |        | 92     |        |
|               | Inshore       | 2,170  | 1,929  | 2,812  | 3,160  | 2,357  | 2,620  | 1,767  | 2,449  | 3,038  | 2,060  |
|               | Lobster Pot   | 0      | 0      | 0      | 0      |        | 0      | 0      | 0      | 0      | 0      |
|               | Offshore      | 346    | 943    | 953    | 962    | 1,307  | 1,163  | 1,003  | 1,136  | 1,299  | 693    |



**Table 5.** Annual patterns in catch composition and fishing activities in Spencer Gulf/Coffin Bay region. Confidential data representing <5 licences are blanked with the light green blocks.

| Activity/Area   |           | 07/08  | 08/09  | 09/10  | 10/11  | 11/12  | 12/13  | 13/14  | 14/15  | 15/16  | 16/17  |
|-----------------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Aust. Salmon    | Game      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |        | 0      |
|                 | Inshore   | 446    | 494    | 279    | 265    | 588    | 564    | 189    | 38     |        | 220    |
|                 | Offshore  | 0      |        | 0      |        |        | 0      | 0      | 0      |        | 0      |
| Bight Redfish   | Game      |        | 0      |        |        |        | 0      | 0      |        | 0      | 0      |
|                 | Inshore   | 322    |        | 922    | 1,404  | 1,458  | 668    | 386    |        | 24     |        |
|                 | Offshore  |        |        | 581    |        |        |        |        |        |        |        |
| Blue Crab       | Lift Net  |        |        |        |        |        | 0      |        |        |        | 0      |
|                 | Inshore   | 657    | 626    | 804    |        | 677    | 641    | 660    |        | 402    |        |
| Garfish         | Inshore   | 560    | 4,621  | 3,080  | 4,021  | 5,904  | 1,373  | 1,187  | 1,899  | 2,350  | 347    |
| Gummy Shark     | Inshore   |        | 15     | 19     |        | 22     | 10     |        |        |        | 15     |
|                 | Offshore  | 0      | 0      |        | 0      |        |        |        | 0      | 0      |        |
| KGW             | Deepwater | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |        | 0      |
|                 | Game      | 0      | 0      |        |        |        | 0      | 0      | 0      |        | 0      |
|                 | Inshore   | 18,348 | 18,144 | 20,014 | 23,463 | 31,006 | 21,971 | 18,183 | 15,126 | 16,204 | 17,956 |
|                 | Offshore  |        | 0      | 0      |        |        | 759    |        |        |        |        |
| Samsonfish      | Inshore   |        |        | 0      |        | 0      | 0      | 0      |        |        |        |
|                 | Offshore  | 0      |        |        | 0      | 0      | 0      | 0      |        |        | 0      |
| School Shark    | Inshore   |        | 15     | 6      | 0      | 9      | 15     |        |        |        |        |
|                 | Offshore  | 0      | 0      | 0      |        |        |        | 0      | 0      |        |        |
| Snapper         | Game      | 0      | 0      |        |        |        | 0      | 0      | 0      | 0      | 0      |
|                 | Inshore   | 17,122 | 15,726 | 16,910 | 15,569 | 13,907 | 9,379  | 6,933  | 7,337  | 4,919  | 4,359  |
|                 | Offshore  |        | 0      |        |        | 169    | 787    | 179    |        |        |        |
| Snook           | Inshore   | 947    | 479    | 1,171  | 949    | 1,202  | 827    | 874    | 1,389  | 1,501  | 1,944  |
| SBT             | Game      | 68     | 49     | 100    |        |        |        |        |        |        |        |
|                 | Inshore   |        |        |        |        |        |        |        |        | 0      |        |
|                 | Offshore  | 0      |        |        |        |        |        |        |        |        |        |
| S. Calamari     | Deepwater | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |        | 0      |
|                 | Game      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |        | 0      | 0      |
|                 | Inshore   | 536    | 1,407  | 1,476  | 1,460  | 6,062  | 4,565  | 2,683  | 2,282  | 2,139  | 1,594  |
|                 | Offshore  | 0      | 0      | 0      | 0      | 0      |        | 0      | 0      | 0      | 0      |
| Silver Trevally | Deepwater | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |        | 0      |
|                 | Game      |        | 0      |        | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
|                 | Inshore   | 652    | 365    | 533    | 989    | 312    | 297    | 587    | 692    | 608    | 1074   |
|                 | Offshore  |        |        |        |        |        |        | 0      |        |        |        |

**Table 6.** Annual patterns in catch composition and fishing activities in the West Coast region. Confidential data representing <5 licences are blanked with the light green blocks.

| Species         | Activity/Area | 07/08 | 08/09 | 09/10 | 10/11 | 11/12 | 12/13 | 13/14 | 14/15 | 15/16 | 16/17 |
|-----------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aust. Salmon    | Game          | 0     | 0     |       | 0     | 0     | 0     | 0     |       | 0     | 0     |
|                 | Inshore       | 136   |       |       |       |       |       |       | 0     |       |       |
|                 | Offshore      | 0     |       |       |       | 0     |       | 0     | 0     | 0     | 0     |
| Bight Redfish   | Game          | 0     | 0     | 0     | 0     | 0     |       | 0     |       | 0     | 0     |
|                 | Inshore       | 313   | 386   | 786   |       | 316   |       |       |       | 1,135 |       |
|                 | Offshore      | 934   |       |       |       |       |       |       |       | 0     |       |
| Blue Crab       | Lift Net      |       |       | 0     |       |       | 0     | 0     | 0     |       |       |
|                 | Game          | 0     | 0     | 0     |       | 0     | 0     | 0     | 0     | 0     | 0     |
|                 | Inshore       |       |       |       | 0     | 0     |       |       | 0     |       |       |
| Garfish         | Inshore       |       | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
| Gummy Shark     | Inshore       |       |       |       |       |       |       |       |       |       |       |
|                 | Offshore      |       | 0     |       | 0     |       | 0     | 0     | 0     | 0     | 0     |
| KGW             | Game          | 0     | 0     | 0     |       |       | 0     | 0     | 0     | 0     | 0     |
|                 | Inshore       | 2,488 | 1,880 | 675   | 1,098 | 1,121 |       | 1,198 | 758   | 538   |       |
|                 | Offshore      |       |       |       | 0     |       |       |       |       | 0     |       |
| Samsonfish      | Game          | 0     | 0     |       | 0     | 0     | 0     | 0     |       | 0     | 0     |
|                 | Inshore       |       |       |       |       | 0     | 0     |       |       |       |       |
|                 | Offshore      |       | 0     | 0     |       | 0     | 0     | 0     | 0     | 0     | 0     |
| School Shark    | Inshore       |       |       |       |       |       |       |       |       |       | 0     |
|                 | Offshore      |       | 0     |       | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
| Snapper         | Game          |       | 0     |       |       | 0     | 0     | 0     | 0     | 0     | 0     |
|                 | Inshore       | 823   | 553   | 854   | 650   | 542   |       | 330   | 1,089 | 558   |       |
|                 | Offshore      |       | 227   |       |       |       |       |       |       | 0     |       |
| Snook           | Game          | 0     |       | 0     |       | 0     | 0     | 0     | 0     | 0     | 0     |
|                 | Inshore       | 99    |       |       |       |       |       |       | 0     |       |       |
|                 | Offshore      |       | 0     |       |       | 0     | 0     | 0     | 0     | 0     | 0     |
| SBT             | Game          |       |       |       |       |       |       |       |       | 0     | 0     |
|                 | Inshore       |       |       | 0     |       | 0     |       |       |       |       |       |
|                 | Offshore      |       |       | 0     |       |       | 0     | 0     | 0     | 0     | 0     |
| S. Calamari     | Inshore       |       |       |       |       |       |       |       |       |       |       |
|                 | Offshore      |       | 0     | 0     | 0     | 0     | 0     | 0     |       | 0     |       |
| Silver Trevally | Inshore       |       |       |       |       |       |       |       |       |       |       |
|                 | Offshore      |       |       |       |       | 0     |       |       |       | 0     |       |

Table 7. Annual patterns in catch composition and fishing activities in the Victor Harbor/South East region. Confidential data representing <5 licences are blanked with the light green blocks.

| Species         | Activity/Area | 07/08 | 08/09 | 09/10 | 10/11 | 11/12 | 12/13 | 13/14 | 14/15 | 15/16 | 16/17 |
|-----------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aust. Salmon    | Game          | 0     | 0     | 0     | 0     | 0     | 0     | 0     |       |       | 0     |
|                 | Inshore       |       |       | 8     | 0     | 56    |       |       |       | 0     | 0     |
| Bight Redfish   | Game          | 0     | 0     | 0     |       | 0     |       |       | 0     | 0     | 0     |
|                 | Inshore       |       |       |       |       |       |       |       |       |       | 4     |
|                 | Offshore      | 0     | 0     |       |       |       |       |       |       | 0     |       |
| Gummy Shark     | Deepwater     | 0     | 0     | 0     | 0     | 0     |       | 0     | 0     | 0     |       |
|                 | Game          | 0     | 0     | 0     |       |       |       |       |       |       | 0     |
|                 | Inshore       |       |       |       |       |       |       |       |       |       | 0     |
| KGW             | Game          | 0     | 0     | 0     | 0     | 0     | 0     |       | 0     | 0     | 0     |
|                 | Inshore       |       |       |       | 602   |       |       | 0     | 0     | 0     |       |
|                 | Offshore      | 0     | 0     | 0     | 0     | 0     |       | 0     | 0     | 0     | 0     |
| Samsonfish      | Offshore      | 0     | 0     | 0     | 0     | 0     | 0     |       | 0     | 0     | 0     |
| School Shark    | Deepwater     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |       |       |       |
|                 | Game          | 0     | 0     |       | 0     | 0     |       |       |       |       |       |
|                 | Inshore       |       | 0     |       |       |       | 0     |       |       |       | 0     |
|                 | Offshore      | 0     | 0     |       |       |       |       |       |       |       |       |
| Snapper         | Game          | 0     | 0     |       |       |       |       |       |       | 0     |       |
|                 | Inshore       | 1,477 | 284   | 990   | 1,111 | 749   | 253   |       | 54    |       |       |
|                 | Drop Net      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |       | 0     |
|                 | Lobster Pot   | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |       |
|                 | Offshore      |       |       |       |       |       |       |       |       |       |       |
| Snook           | Game          | 0     |       | 0     | 0     | 0     |       |       | 0     | 0     | 0     |
|                 | Inshore       | 0     | 19    |       |       |       |       | 0     | 0     |       | 0     |
| SBT             | Deepwater     | 0     | 0     | 0     |       | 0     | 0     | 0     | 0     |       | 0     |
|                 | Game          |       |       |       |       |       |       |       | 367   | 403   | 269   |
|                 | Inshore       | 0     | 0     |       |       |       | 0     |       |       |       | 0     |
| S. Calamari     | Inshore       | 0     | 0     |       | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
|                 | Offshore      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |       |
|                 |               |       |       |       |       |       |       |       |       |       |       |
| Silver Trevally | Inshore       |       |       |       |       |       |       | 0     | 0     |       | 0     |

**Table 8.** Annual patterns in catch composition and fishing activities in ‘Other’ region. Confidential data representing <5 licences are blanked with the light green blocks.

| Species         | Activity/Area | 07/08 | 08/09 | 09/10 | 10/11 | 11/12 | 12/13 | 13/14 | 14/15 | 15/16 | 16/17 |
|-----------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aust. Salmon    | Inshore       | 0     | 0     | 0     | 0     | 0     |       | 0     |       | 0     | 0     |
|                 | Offshore      |       |       |       |       | 0     | 0     | 0     | 0     |       |       |
| Bight Redfish   | Deepwater     | 0     | 0     | 0     | 0     | 0     |       | 0     | 0     | 0     | 0     |
|                 | Game          |       | 0     | 0     | 0     | 0     | 0     | 0     |       |       | 0     |
|                 | Inshore       |       | 0     |       |       |       |       |       |       |       |       |
|                 | Offshore      |       |       |       |       |       | 530   |       |       |       |       |
| Gummy Shark     | Inshore       | 0     | 0     | 0     | 0     | 0     | 0     | 0     |       | 0     | 0     |
|                 | Offshore      | 0     |       |       |       | 0     |       | 0     | 0     | 0     |       |
| KGW             | Game          | 0     | 0     | 0     | 0     |       | 0     | 0     | 0     | 0     | 0     |
|                 | Inshore       |       | 0     |       |       | 152   | 0     |       |       |       |       |
|                 | Offshore      | 0     |       | 0     | 0     | 0     | 0     | 0     | 0     |       |       |
| Samsonfish      | Game          |       | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
|                 | Inshore       |       | 0     | 0     | 0     | 0     | 0     | 0     | 0     |       | 0     |
|                 | Offshore      |       |       | 0     |       |       |       |       | 0     |       |       |
| School Shark    | Inshore       | 0     | 0     | 0     | 0     | 0     |       | 0     | 0     |       | 0     |
|                 | Offshore      |       | 0     |       | 0     | 0     |       | 0     | 0     | 0     |       |
| Snapper         | Game          | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |       | 0     |
|                 | Inshore       |       | 0     |       |       |       |       |       |       | 0     |       |
|                 | Offshore      |       |       |       |       |       |       | 0     |       |       |       |
| Snook           | Game          |       | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
|                 | Inshore       |       | 0     | 0     | 0     | 0     | 0     |       | 0     | 0     | 0     |
|                 | Offshore      | 0     | 0     |       |       | 0     | 0     | 0     | 0     | 0     |       |
|                 |               |       |       |       |       |       |       |       |       |       |       |
| SBT             | Deepwater     | 0     | 0     | 0     | 0     | 0     |       | 0     | 0     | 0     | 0     |
|                 | Game          | 66    |       |       |       |       |       |       |       |       |       |
|                 | Inshore       | 0     | 0     |       | 0     | 0     |       | 0     |       |       | 0     |
|                 | Offshore      | 0     | 0     |       | 0     | 0     |       |       | 0     |       |       |
| S. Calamari     | Game          |       | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
|                 | Inshore       |       | 0     | 0     | 0     | 0     | 0     | 0     | 0     |       |       |
|                 | Offshore      |       |       |       | 0     | 0     |       | 0     | 0     |       | 0     |
| Silver Trevally | Game          |       | 0     | 0     | 0     | 0     | 0     |       |       | 0     | 0     |
|                 | Inshore       |       | 0     |       | 0     | 0     | 0     | 0     |       |       |       |
|                 | Offshore      |       |       |       |       | 0     |       | 0     | 0     |       |       |

## DISCUSSION

Challenges in the SACBF include changing patterns of demand by clients to target particular species, seasonality of suitable weather to travel to offshore grounds, and the low diversity and availability of alternative targets when the stock status of key species (e.g. Snapper) is uncertain. Downward trends in client numbers and trip days have occurred since 2012/13, and may reflect broader tourism market stressors, uncertainty in the stock status and availability of key target species, and changing consumer expectations regarding what constitutes valued recreational/charter fishing experiences. A decline in demersal target species, including Snapper and KGW, and toward the pelagic species (e.g. SBT) has been a continuing, yet regionally dependent trend (Steer and Tsolos 2016). Seasonal and spatial closures for Snapper and KGW reduce effort during the spawning seasons of these species and may have influenced annual catches in the seasons since their inception. Social media and changing motivations to go fishing for particular species may play roles in driving demand by clients to participate in the fishery. These factors have the potential to drive change in customer perception and popularity of targeting traditional demersal fishing resources (e.g. Snapper and KGW), versus large-bodied pelagic species.

Observed trends in LML-based release rates of Snapper and KGW indicate these species were consistently targeted through the time series, with release ratios remaining consistent despite down-trending nominal catches. Regional trends in nominal catch compositions for key target species during the 2016/17 season showed that Gulf St Vincent and Kangaroo Island was mostly supported by catches of KGW, Snapper, and Bight Redfish. Catches in the adjoining Victor Harbor and South-East regions were characterised by SBT, Snapper and KGW reflecting the diverse and combined inshore/offshore and continental shelf regions of that section of the fishery. In Spencer Gulf and Coffin Bay, operators mostly targeted KGW, Snapper, Snook and Southern Calamari, whereas in the West Coast region, charters focused on Snapper, KGW and Bight Redfish. Operators in the 'Other' areas comprising the offshore areas of the eastern GAB and south of Kangaroo Island, mostly caught a mix of demersal and pelagic species, including Bight Redfish, SBT, and KGW. These trends reflect species distributions and relative availability of suitable habitats, depth strata, and preferred prey across the spatial scale and depth dimensions of the fishery area. Notably, the operators based in regions directly adjacent to shelf waters have greater access to iconic, large-bodied pelagic species (e.g. SBT), which in-turn, provides greater diversity of potential targets, and hence, more flexibility to satisfy client demands across the range of weather conditions within which they operate.

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