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# Survey of Recreational Fishing in South Australia in 2021–22



C.L. Beckmann, L.M. Durante, A. Graba-Landry\*, K.E. Stark\*, and S.R. Tracey\*

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> > SARDI Aquatics Sciences PO Box 120 Henley Beach SA 5022

# January 2023

\*Institute for Marine and Antarctic Studies (IMAS), College of Sciences and Engineering, University of Tasmania

**Report to PIRSA Fisheries and Aquaculture** 





Department of Primary Industries and Regions

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# TABLE OF CONTENTS

| ACKNO  | WLEDGEMENTS                                  | IX  |
|--------|--|-----|
| EXECU  | TIVE SUMMARY                                 | 1   |
| 1. INT | RODUCTION                                    | 4   |
| 1.1.   | Recreational fishing in South Australia      | 4   |
| 1.2.   | Need for recreational fishing information    | 4   |
| 1.3.   | Survey design                                | 5   |
| 1.4.   | Survey objectives                            | 6   |
| 2. ME  | THODS  | 7   |
| 2.1.   | Survey scope                                 | 7   |
| 2.2.   | Regions                                      | 13  |
| 2.3.   | Fishing effort                               |     |
| 2.4.   | Catch  |     |
| 2.5.   | On-site sampling                             | 17  |
| 2.6.   | Data expansion                               |     |
| 3. RE  | SULTS  |     |
| 3.1.   | Sample and response profiles                 |     |
| 3.2.   | Fisher characteristics                       | 24  |
| 3.3.   | Fishing effort                               |     |
| 3.4.   | Catches                                      |     |
| 3.5.   | Key species                                  |     |
| 3.6.   | Comparison to previous surveys               |     |
| 3.7.   | Fisher motivations, attitudes, and awareness | 111 |
| 4. DIS | CUSSION                                      | 119 |
| 4.1.   | General                                      | 119 |
| 4.2.   | Fishing participation                        | 119 |
| 4.3.   | Effort                                       | 121 |
| 4.4.   | Catch  |     |
| 4.1.   | Improving the precision of survey estimates  | 123 |
| 4.2.   | Impact of COVID-19                           |     |
| 4.3.   | Future directions                            | 125 |
| 5. REF | FERENCES                                     |     |
| 6. APF | PENDIX                                       | 129 |

# LIST OF FIGURES

| Figure 2.1. Diagrammatic representation of the 2021–22 recreational fishing survey design. 8       |
|--|
| Figure 2.2. Map of South Australia showing Australian Bureau of Statistics Statistical Areas       |
| (colour coded) used for sample stratification13  |
| Figure 2.3. Map of South Australia showing analysis regions used for reporting fishing             |
| activities   |
| Figure 3.1. Recreational fishing participation in South Australia during the 12 months prior to    |
| March 2021 by region of residence for fishers aged five years or older                             |
| Figure 3.2. Fishing participation in the 12 months prior to March 2021 by age group and gender     |
| by SA residents aged five years or older27   |
| Figure 3.3. Individual fishing effort by South Australian residents aged five years or older       |
| fishing in South Australia from March 2021 to February 2022  |
| Figure 3.4. Relationship between the number of fishers and their cumulative fishing effort. 30     |
| Figure 3.5. Fishing effort (fisher days) by water body type for SA residents aged five years or    |
| older who fished in SA from March 2021 to February 2022  |
| Figure 3.6. Fishing effort (fisher days) by fishing method for SA residents aged five years or     |
| older who fished in SA from March 2021 to February 2022. Error bars represent standard             |
| error  |
| Figure 3.7. Fishing effort (fisher days) for SA residents aged five years or older who fished in   |
| SA from March 2021 to February 202234  |
| Figure 3.8. Relative importance (% release numbers) of different reasons for release of key        |
| species taken by SA residents aged five years or older who fished in SA from March 2021            |
| to February 202240   |
| Figure 3.9. Percentage composition of the recreational catch (numbers retained and released)       |
| by water body in SA from March 2021 to February 2022   |
| Figure 3.10. Percentage composition of the recreational catch (number retained and released)       |
| by fishing method in SA from March 2021 to February 2022   |
| Figure 3.11. Characteristics of the recreational fishery for King George Whiting in South          |
| Australia from March 2021 to February 202257   |
| Figure 3.12. Characteristics of the recreational fishery for Australian Herring in South Australia |
| from March 2021 to February 202259   |
| Figure 3.13. Characteristics of the recreational fishery for Southern Garfish in South Australia   |
| from March 2021 to February 202260   |
| Figure 3.14. Characteristics of the recreational fishery for Western Australian Salmon in South    |
| Australia from March 2021 to February 202262   |

| Figure 3.15. Characteristics of the recreational fishery for Leatherjacket in South Australia     |
|---|
| from March 2021 to February 202263  |
| Figure 3.16. Characteristics of the State-wide recreational fishery for Yelloweye Mullet in       |
| South Australia from March 2021 to February 202265  |
| Figure 3.17. Characteristics of the recreational fishery for Snapper in South Australia from      |
| March 2021 to February 202266   |
| Figure 3.18. Characteristics of the recreational fishery for Flathead (multiple species) in South |
| Australia from March 2021 to February 202267  |
| Figure 3.19. Characteristics of the State-wide recreational fishery for Bight Redfish in South    |
| Australia from March 2021 to February 202268  |
| Figure 3.20. Characteristics of the State-wide recreational fishery for Silver Trevally in South  |
| Australia from March 2021 to February 202269  |
| Figure 3.21. Characteristics of the recreational fishery for Snook in South Australia from March  |
| 2021 to February 202271   |
| Figure 3.22. Characteristics of the State-wide recreational fishery for Sweep in South Australia  |
| from March 2021 to February 202272  |
| Figure 3.23. Characteristics of the recreational fishery for Black Bream in South Australia from  |
| March 2021 to February 202273   |
| Figure 3.24. Characteristics of the recreational fishery for Southern Bluefin Tuna in South       |
| Australia from March 2021 to February 202274  |
| Figure 3.25. Characteristics of the State-wide recreational fishery for Gummy Shark in South      |
| Australia from March 2021 to February 202275  |
| Figure 3.26. Characteristics of the recreational fishery for Mulloway in South Australia from     |
| March 2021 to February 202276   |
| Figure 3.27. Characteristics of the recreational fishery for Blue Swimmer Crab in South           |
| Australia from March 2021 to February 202278  |
| Figure 3.28. Characteristics of the recreational fishery for Southern Calamari in South           |
| Australia from March 2021 to February 202280  |
| Figure 3.29. Characteristics of the recreational fishery for Southern Rock Lobster in South       |
| Australia from March 2021 to February 202281  |
| Figure 3.30. Characteristics of the recreational fishery for Sand Crab in South Australia from    |
| March 2021 to February 202282   |
| Figure 3.31. Characteristics of the State-wide recreational fishery for Yabby in South Australia  |
| from March 2021 to February 202283  |
| Figure 3.32. Characteristics of the State-wide recreational fishery for Carp in South Australia   |
| from March 2021 to February 202285  |

| Figure 3.33. Characteristics of the State-wide recreational fishery for Golden Perch in South  |
|--|
| Australia from March 2021 to February 202286   |
| Figure 3.34. Characteristics of the State-wide recreational fishery for Murray Cod in South  |
| Australia from March 2021 to February 202287   |
| Figure 3.35. Characteristics of the Gulf St Vincent (GSV) recreational fishery from March 2021   |
|  |
| Figure 3.36. Characteristics of the Spencer Gulf (SG) recreational fishery from March 2021 to<br>February 2022   |
| Figure 3.37 Characteristics of the South-West Coast recreational fishery from March 2021 to  |
| February 2022 93   |
| Figure 3.38. Characteristics of the South-East and Far South-East recreational fishery from<br>March 2021 to February 2022   |
| Figure 3.39 Fishing participation (number of fishers and proportion of population) in the 12   |
| months prior to May 2000, October 2007, November 2013, and March 2021 by SA residents  |
| aged five years or older   |
| Figure 3.40. Fishing participation in the 12 months prior to May 2000, October 2007,   |
| November 2013, and March 2021 by area of residence for fishers aged five years or older  |
| Figure 3.41 Fishing participation in the 12 months prior to May 2000 October 2007  |
| November 2013, and March 2021 by area of residence for fishers aged five years or older  |
|  |
|  |
| 98<br>Figure 3.42. Comparison of fishing effort (fisher days) for SA residents aged five years or older  |
| 98<br>Figure 3.42. Comparison of fishing effort (fisher days) for SA residents aged five years or older<br>who fished in SA during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. 100  |
|  |
|  |
|  |
|  |
| <ul> <li>98</li> <li>Figure 3.42. Comparison of fishing effort (fisher days) for SA residents aged five years or older who fished in SA during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. 100</li> <li>Figure 3.43. Comparison of fishing effort (fisher days) by fishing method for SA residents aged five years or older who fished in SA during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. 101</li> <li>Figure 3.44. Comparison of fishing effort (fisher days) by fishing regions for SA residents aged five years or older who fished in during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. 101</li> <li>Figure 3.44. Comparison of fishing effort (fisher days) by fishing regions for SA residents aged five years or older who fished in during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. 101</li> <li>Figure 3.45. Total catch numbers (retained and released) and numbers retained (harvested)</li> </ul>  |
| <ul> <li>98</li> <li>Figure 3.42. Comparison of fishing effort (fisher days) for SA residents aged five years or older who fished in SA during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. 100</li> <li>Figure 3.43. Comparison of fishing effort (fisher days) by fishing method for SA residents aged five years or older who fished in SA during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. 101</li> <li>Figure 3.44. Comparison of fishing effort (fisher days) by fishing regions for SA residents aged five years or older who fished in during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. 101</li> <li>Figure 3.44. Comparison of fishing effort (fisher days) by fishing regions for SA residents aged five years or older who fished in during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. 101</li> <li>Figure 3.45. Total catch numbers (retained and released) and numbers retained (harvested) for key marine finfish species by survey year for South Australian residents aged 5 years</li> </ul>  |
| <ul> <li>98</li> <li>Figure 3.42. Comparison of fishing effort (fisher days) for SA residents aged five years or older who fished in SA during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. 100</li> <li>Figure 3.43. Comparison of fishing effort (fisher days) by fishing method for SA residents aged five years or older who fished in SA during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. 101</li> <li>Figure 3.44. Comparison of fishing effort (fisher days) by fishing regions for SA residents aged five years or older who fished in during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. 101</li> <li>Figure 3.44. Comparison of fishing effort (fisher days) by fishing regions for SA residents aged five years or older who fished in during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. 101</li> <li>Figure 3.45. Total catch numbers (retained and released) and numbers retained (harvested) for key marine finfish species by survey year for South Australian residents aged 5 years or older. 103</li> </ul>  |
| <ul> <li>98</li> <li>Figure 3.42. Comparison of fishing effort (fisher days) for SA residents aged five years or older who fished in SA during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. 100</li> <li>Figure 3.43. Comparison of fishing effort (fisher days) by fishing method for SA residents aged five years or older who fished in SA during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. 101</li> <li>Figure 3.44. Comparison of fishing effort (fisher days) by fishing regions for SA residents aged five years or older who fished in during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. 101</li> <li>Figure 3.44. Comparison of fishing effort (fisher days) by fishing regions for SA residents aged five years or older who fished in during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. 101</li> <li>Figure 3.45. Total catch numbers (retained and released) and numbers retained (harvested) for key marine finfish species by survey year for South Australian residents aged 5 years or older. 103</li> <li>Figure 3.46. Total catch numbers (retained and released) and numbers retained (harvested)</li> </ul>   |
| <ul> <li>98</li> <li>Figure 3.42. Comparison of fishing effort (fisher days) for SA residents aged five years or older who fished in SA during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. 100</li> <li>Figure 3.43. Comparison of fishing effort (fisher days) by fishing method for SA residents aged five years or older who fished in SA during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. 101</li> <li>Figure 3.44. Comparison of fishing effort (fisher days) by fishing regions for SA residents aged five years or older who fished in during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. 101</li> <li>Figure 3.44. Comparison of fishing effort (fisher days) by fishing regions for SA residents aged five years or older who fished in during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. 101</li> <li>Figure 3.45. Total catch numbers (retained and released) and numbers retained (harvested) for key marine finfish species by survey year for South Australian residents aged 5 years or older. 103</li> <li>Figure 3.46. Total catch numbers (retained and released) and numbers retained (harvested) for marine finfish species by survey year for South Australian residents aged 5 years or older. 103</li> </ul> |

| Figure 3.47. Total catch numbers (retained and released) and numbers retained (harvested)  |
|--|
| for marine finfish species by survey year for South Australian residents aged 5 years or   |
| older  |
| Figure 3.48. Total catch numbers (retained and released) and numbers retained (harvested)  |
| for key marine invertebrate species by survey year for South Australian residents aged 5   |
| years or older   |
| Figure 3.49. Total catch numbers (retained and released) and numbers retained (harvested)  |
| for key marine invertebrate species by survey year for South Australian residents aged 5   |
| years or older   |
| Figure 3.50. Total catch numbers (retained and released) and numbers retained (harvested)  |
| for key marine freshwater species by survey period for South Australian residents aged 5   |
| years or older   |
|  |
| Figure 3.51. Percentage of respondents who classified the importance of recreational fishing   |
| Figure 3.51. Percentage of respondents who classified the importance of recreational fishing activities compared to other hobbies                    |
| Figure 3.51. Percentage of respondents who classified the importance of recreational fishing activities compared to other hobbies                    |
| <ul> <li>Figure 3.51. Percentage of respondents who classified the importance of recreational fishing activities compared to other hobbies</li></ul> |
| <ul> <li>Figure 3.51. Percentage of respondents who classified the importance of recreational fishing activities compared to other hobbies</li></ul> |
| <ul> <li>Figure 3.51. Percentage of respondents who classified the importance of recreational fishing activities compared to other hobbies</li></ul> |
| <ul> <li>Figure 3.51. Percentage of respondents who classified the importance of recreational fishing activities compared to other hobbies</li></ul> |
| <ul> <li>Figure 3.51. Percentage of respondents who classified the importance of recreational fishing activities compared to other hobbies</li></ul> |
| <ul> <li>Figure 3.51. Percentage of respondents who classified the importance of recreational fishing activities compared to other hobbies</li></ul> |

# LIST OF TABLES

| Table 2.1. Gear types allocated to each fishing method groups    11                            |
|--|
| Table 2.2. Fishing platforms allocated to the boat and shore groups                            |
| Table 2.3. Waterbodies allocated to freshwater and saltwater groups                            |
| Table 3.1. Estimated number of fishers and days fished by SA residents aged five years or      |
| older who fished in freshwater and saltwater in SA from 1 March 2021 to 28 February 2022.      |
|  |
| Table 3.2. Fishing effort (fisher days) by residential area (columns) and fishing area (rows). |
|  |
| Table 3.3. Estimated annual catch (total, retained and released) and proportion released for   |
| key Marine Finfish species from March 2021 to February 2022                                    |
| Table 3.4. Estimated annual catch (total, retained and released) and proportion                |
| released/discarded for key marine invertebrates and freshwater species from March 2021         |
| to February 2022   |
| Table 3.5. Summary table indicating groupings based on the proportion of the recreational      |
| catch for key species that was taken by targeted effort from March 2021 to February 2022       |
|  |
| Table 3.6. Annual harvest (number), average weight (kg) and estimated harvest weight (t) for   |
| key species taken by recreational fishers in SA from March 2021 to February 2022,              |
| compared with commercial catch over the same period (logbook returns)                          |
| Table 3.7. Annual harvest (number), average weight (kg) and estimated harvest weight (t) for   |
| key species taken by recreational fishers in SA from March 2021 to February 2022 by stock      |
| assessment unit , compared with commercial catch over the same period (logbook returns).       |
|  |
| Table 3.8. Annual harvest (number), average weight (kg) and estimated harvest weight (t) for   |
| key species taken by recreational fishers in SA from March 2021 to February 2022 by            |
| region, compared with commercial catches over the same period                                  |
| Table 3.9. Estimated catch by line fishing mode showing catch number and proportion taken      |
| using bait and/or lure/fly/jig for key species from March 2021 to February 202253              |
| Table 3.10. Summary of the proportion of the recreational catch of key species taken by boat-  |
| based activities from March 2021 to February 202255  |

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This report was formally reviewed by Mr George Giatas, Drs Troy Rogers and Kevin Mark (SARDI Aquatic and Livestock Sciences), a team at the Western Australian Department of Primary Industries and Regional Development, and Ms Skye Barrett (PIRSA), and approved for release by Dr Stephen Mayfield (Fisheries Program Leader, SARDI Aquatic and Livestock Sciences) and Dr Mike Steer (Research Director, SARDI Aquatic and Livestock Sciences).

IX

## **EXECUTIVE SUMMARY**

This study represents the fourth comprehensive assessment of recreational fishing in South Australia (SA). Estimates of participation, catch and effort were determined for key species using a probability-based survey design. Estimates were expanded to the population level at either the regional or state-wide scale, with the precision around each estimate indicated.

## Participation

Information about participation rates and the demographic profiles of recreational fishers was collected from a survey of 5,099 SA households from a sample of 29,858 that were randomly selected and stratified by statistical area. Of those, 1,300 eligible households were recruited into the 12-month diary survey. Telephone interviewers collected data on all household fishing activity undertaken between 1 March 2021 and 28 February 2022.

Based on recalled activity from the 12 months prior to March 2021, an estimated 356,708 SA residents aged 5 years or older fished at least once in SA, representing an overall participation rate of 23%. Participation rates were highest for fishers residing in regional areas, and among males. While the youngest age group had the highest participation rate, the greatest number of fishers were in the 45–59-year-old age group. Overall, during the 2021–22 survey period, the number of fishers was 29% higher than 2013–14 and 9% higher than in 2000–01. The largest difference in fisher numbers was observed for fishers residing in Adelaide, coinciding with higher population growth relative to the other regions. During the 2021–22 survey period, participation rates were high compared to 2013–14 and similar to 2000–01.

#### Catch and effort

During the 12-month survey period, 297,244 SA residents were estimated to have fished in SA. This was nearly 20% lower than the estimate from the previous 12 months (356,708 fishers) determined at screening. This reduction in fisher numbers may partly be due to overestimation of fishing activity by screened survey participants, who were asked to recall activity from up to 12 months ago, compared to diarists who reported regularly on their activity during the survey period.

From March 2021 to February 2022, recreational fishers accounted for 1,305,323 fisher days of effort, with an average of 4.4 days per fisher. Fishing effort was mostly attributed to inshore marine waters, with line fishing the most common method. Overall, shore-based fishing accounted for greater effort than boat-based fishing (including all types of watercrafts), largely due to high levels reported in Gulf St Vincent, and to a lesser extent, the Lower Lakes, Coorong

and River Murray. Effort during the 2021–22 survey period was 37% greater than 2013–14 but remained 33% lower than 2000–01.

A wide variety of fish species were caught by recreational fishers, with an estimated 2.7 million marine finfish retained and 1.8 million released during the 2021–22 survey period. King George Whiting represented the most caught marine finfish by number with 1.1 million fish retained (estimated weight 305 tonnes, t) and 705K released. The next most caught marine finfish were Australian Herring (452K retained, estimated weight 40 t), Southern Garfish (265K retained, estimated weight 24 t) and Western Australian Salmon (155K retained, estimated weight 82 t). During the 2021–22 survey period, marine finfish catch was approximately 30% less than that observed during the 2013–14 survey period.

During the 2021–22 survey period, a further 3.1 million marine invertebrates were retained (cf. 1.7 million released) and 1.1 million freshwater fish and invertebrates were retained (341K released). Blue Swimmer Crab represented 40% of the marine invertebrate catch by number with 921K retained (estimated weight 251 t) and 1.0 million released. Comparatively high catches were also reported for Pipi (1.1 million retained, estimated weight 18 t), Freshwater Yabby (714K retained, estimated weight 59 t), Southern Calamari (550K retained, estimated weight 219 t) and Freshwater Shrimp (194K retained). Catch of marine invertebrates has generally been similar between surveys with the 2021–22 survey estimate comparable to 2000–01, while catch of freshwater invertebrates was variable across surveys from 2000–01 to 2021–22.

#### Motivations, attitudes and awareness

Most 'wash-up' survey participants considered recreational fishing an important pastime when compared to other hobbies. The main factors motivating fishers were not related to catch, but to relaxation or socialisation. Social motives, such as spending time with family and friends, has increased in importance over the past 20 years. Overall, participants valued the non-catch aspects of the fishing experience, however, the prospect of catching a fish remained at the core of the fishing experience. Fisher characteristics such as gender, age, avidity, and waterbody fished influenced fisher motivation and consumptive orientation. Most fishers identified themselves as stewards for fisheries resources and nearly all participants agreed that the sustainable management of fish stocks is important.

Keywords: participation, demographics, catch, effort, recreational, fishing



# 5,000

# 1,300

South Australian households participated in a telephone survey in early 2021 to see if they **fished in the past 12 months**  households provided information about their **fishing activity** from March 2021 to February 2022 via a telephone survey

## **RECREATIONAL FISHERS**

356,708

**23**% of South Australians participated in recreational fishing at least once in the past 12 months



#### **11 MILLION FISH & INVERTEBRATES WERE CAUGHT**

| 90+ different species  |            |             |                |                 |
|--|------------|-------------|----------------|-----------------|
|  | No. Caught | No.<br>Kept | Tonnes<br>Kept | Release<br>rate |
| Ş  | 1,963,340  | 920,721     | 251            | 53%             |
| and the second s | 1,834,492  | 1,129,574   | 305            | 38%             |
| $\bigcirc$   | 1,704,036  | 1,149,016   | 18             | 33%             |
| The second se  | 946,905    | 714,447     | 59             | 25%             |
|  | 648,190    | 452,010     | 40             | 30%             |
| 20   | 573,808    | 550,179     | 219            | 4%              |
|  | 328,208    | 264,506     | 24             | 19%             |
|  | 280,069    | 154,614     | 82             | 45%             |

#### 1,305,323 DAYS WERE FISHED



# **1. INTRODUCTION**

## 1.1. Recreational fishing in South Australia

Recreational fishing is a popular activity in South Australia (SA). In 2013–14, it was estimated that 277,027 (standard error, SE = 13,564) SA residents participated in recreational fishing, equivalent to a participation rate of 18% (Giri and Hall 2015). In SA, recreational fishing provides important benefits to the economy, with the total value of recreational fishing expenditure estimated at \$160.8M during 2015–16 (Deloitte Access Economics 2017). Recreational fishing also holds important social and cultural value to South Australians. This is evidenced by non-catch motivations such as "to relax and unwind", "to be outdoors", or "to fish for sport" ranking as more important to fishers than catch-based motivations such as "to catch fresh fish for food" (Henry and Lyle 2003).

In SA, a majority of recreational fishing is undertaken in marine waters including estuaries, with a smaller amount of freshwater effort (Jones 2009, Giri and Hall 2015). A variety of permitted gear types are used across a range of platforms (e.g., boats, jetties, breakwaters, and shore). The group of species that are most commonly caught by recreational fishers are marine finfish, with estimates (by number) of 10.2 million, 6.5 million and 6.9 million from surveys during 2000–01, 2007–08 and 2013–14, respectively (Jones and Doonan 2005, Jones 2009, Giri and Hall 2015). Catches of marine invertebrates are also relatively common for recreational fishers, with estimates ranging from 3.3 million during 2007–08 to 4.9 million during 2013–14 (Jones 2009, Giri and Hall 2015). Freshwater fish and invertebrates make up a smaller proportion of the recreational catch with between 400,000 and 840,000 reported during 2007–08 and 2013–14, respectively (Jones and Doonan 2005, Jones 2009, Giri and Hall 2015). This report provides an update of the estimated recreational catches for SA residents for 2021–22.

#### 1.2. Need for recreational fishing information

South Australia's community-owned fishery resources support a shared access fishery with significant ecological importance. Estimates of catches from the various sectors which access the resource are required to inform fishery management under the *Fisheries Management Act 2007*. While commercial fishers are required to report their fishing activity as part of their licence conditions, there is generally no requirement to report recreational catches in SA (with the exception of Snapper in the South-East). Obtaining suitable estimates of recreational catch and effort is challenging due to the diverse range of fishing opportunities across SA's 4,204 km of coastline and abundant freshwater systems, including the River Murray. During the

2013–14 survey period, the highest number of fishers (59.8%) came from the Adelaide statistical division (SD) which had the highest population (547,106), and these fishers fished 56.7% of the total fishing days (Giri and Hall 2015). Despite the large number of fishers in the Adelaide SD, participation rates and number of days fished were low compared to regional areas such as the Eyre SD (Eyre Peninsula) which has a much lower resident population (13,242) (Giri and Hall 2015).

As SA does not have a general recreational fishing licence or registration system, there is not a comprehensive list of participants available. As a result, State-wide surveys are conducted using general population databases for the sampling frame, which require many households to be contacted to identify recreational fishers. While this method can provide reasonable confidence in participation estimates, it can be difficult to achieve the sample sizes required for precise estimates of catch and effort at the spatial scales at which fisheries are managed. For some species, this can be addressed by undertaking more targeted surveys to improve the precision for specialised or localised activities. Examples include surveys undertaken in SA with a regional focus (Franklin Harbour) (Jones and Retallick 1990), species-specific surveys (Southern Rock Lobster) (McGlennon 1999, Venema *et al.* 1999, Currie 2006), and platform-specific surveys (McGlennon and Kinloch 1997). More recently, targeted on-site surveys were also conducted to assess recreational catch and effort for Pipis at Goolwa (Hall *et al.* 2015, Durante *et al.* 2022) and Blue Swimmer Crabs in Northern Gulf St Vincent (Giri and Hall 2015).

Comparison of survey estimates between years can be challenging when different methodologies are used. As such, standardised methods were developed for estimating recreational participation, catch and effort (Lyle *et al.* 2002) and implemented during the 2000–01 National Recreational Fishing Survey (NRFS) (Henry and Lyle 2003). Subsequent State-wide surveys in SA were conducted using the methodology developed as part of the NRFS which consisted of a telephone survey of randomly selected households, a 12-month telephone-diary survey of eligible participants, on-site (creel) surveys, and a 'wash-up' survey conducted over the phone (Henry and Lyle 2003). While sample sizes and response rates have varied, the overall methodology used was relatively consistent for the surveys conducted in 2007–08 (Jones 2009) and 2013–14 (Giri and Hall 2015).

#### 1.3. Survey design

The State-wide survey was conducted under a multi-phase design. The off-site component utilised a general population database (landline and mobile phone numbers of SA residents) as the sampling frame. An initial screening survey was undertaken to identify and recruit

5

eligible respondents for the longitudinal phone diary survey. This was followed by post enumeration surveys to detect differences among participants ('wash-up', non-intending fisher and benchmark surveys). The on-site component involved interviews with fishers at key fishing locations to collect biological information. The main period of data collection was from 1 March 2021 to 28 February 2022, and the post-enumeration surveys were completed from March to May 2022.

This report presents results from the State-wide survey for the 12-months from March 2021 to February 2022 and provides comparisons with previous the State-wide component of the NFRS from May 2000 to April 2001 (Henry and Lyle 2003), and State-wide surveys conducted from November 2007 to October 2008 (Jones 2009), and December 2013 to November 2014 (Giri and Hall 2015). Additionally, the results of the 'wash-up' survey identifying social, behavioural and attitudinal responses to recreational fishing in SA are reported.

## 1.4. Survey objectives

The primary objectives of this survey were to generate estimates of participation (number of fishers), effort (fisher days), and catch (by number) for all species (total, retained and released), and catch (by weight) for key commercial species for 12-months at State-wide and regional levels. It is important to note that the precision of the estimates presented varies greatly depending on the sample size, with the survey designed to provide precision at the State-wide level for key species. It is well documented that specialised or localised activities are not well captured by large scale surveys and targeted surveys are often required to achieve greater precision around catch and effort estimates for such species (Lyle *et al.* 2019, Ryan *et al.* 2019).

Estimates of recreational catch by weight enable comparisons with data obtained routinely from the commercial sector. An additional objective was to report on the demographic and behavioural characteristics of recreational fishers in SA.

# 2. METHODS

An off-site survey using the telephone diary method was used to collect data on recreational fishing activity. A detailed description of this method is provided in Henry & Lyle (2003) and Lyle *et al.* (2002). Data analysis are described in detail by Lyle *et al.* (2010) and were generated using the statistical computing language R (R Development Core Team 2022). The Survey of Recreational Fishing in South Australia (off-site) was reviewed and approved by the University of Tasmania Human Research Ethics Committee H0023757.

# 2.1. Survey scope

The surveyed population encompassed the resident private-dwelling (PD) population of SA, aged five years and older. The survey was designed to capture information on their recreational fishing activity and in this context, recreational fishing is defined broadly as the capture or attempted capture of aquatic animals in all SA waters (freshwater, estuarine or marine) other than for commercial purposes. All recreational fishing techniques and harvesting activities, including dive and hand collection, the use of pots, nets, and spears in addition to line fishing, were considered in-scope.

In contrast to the 2000–01 survey, but consistent with the 2007–08 and 2013–14 surveys, fishing activities by non-SA residents in SA and fishing by SA residents in other states of Australia was considered out-of-scope. The 2000–01 survey estimated that SA residents applied over 95% of the fishing effort; with interstate residents exerting almost 5% (Jones and Doonan 2005).

# 2.1.1. Survey methodology

The telephone-diary survey was conducted using a multi-phase design (Fig. 2.1). During phase one profiling information was collected from a sample of the population. Phase one (screening phase) also included a process to identify eligibility to progress to phase two. Where participants identified a likelihood of fishing in the next 12 months, they were considered eligible and invited to participate in the next phase.

In phase two (the longitudinal survey), detailed catch and effort information was collected over a 12-month survey period. Participants in this phase were provided with a fishing diary that they could choose to use to jog their memory of completed fishing events when they were contacted by survey interviewers who were responsible for collecting this information. Contact from the interviewers was regular and guided by how often the diarist was fishing. In most cases the contact was on at least a monthly basis with interviewers only holding off in cases where the diarist indicated they would not fish until a specified date/period. This approach aimed to minimise respondent burden and maximising response and data quality, whether the diary was used or not.

Phase three (non-intending fisher call back survey) was undertaken at the end of the 12-month longitudinal phase where call-backs to a sub-sample of non-intending fishers identified during phase one. This was conducted to account for any 'unexpected fishing' activity from households that were screened out of the longitudinal survey.

Finally, phase four (the 'wash-up' survey) was conducted for those respondents that completed the longitudinal phase. This was designed to assess motivations, awareness, and attitudes to fishing-related matters. The Survey of Recreational Fishing in SA (off-site) was reviewed and approved by the University of Tasmania Human Research Ethics Committee H0023757.



Figure 2.1. Diagrammatic representation of the 2021–22 recreational fishing survey design

# 2.1.2. Screening

The primary objective of the screening survey was to collect profiling information for all household members. This information is required to calibrate the responses against population benchmarks, to characterise the sample population, and to examine issues relating to representation and response biases. The secondary objective was to identify people who were eligible to participate in the follow-up diary phase.

The screening survey was designed as a structured interview conducted by telephone on a sample of SA private-dwelling (PD) households. Sampling was undertaken without replacement for sample loss (e.g., disconnected numbers, non-private dwellings). Stratified random sampling of unique address-based phone numbers from the SamplePages database (https://samplepages.com.au/) was undertaken at the Australian Bureau of Statistics (ABS) Statistical Area Level 3 (SA3) spatial scale. The population of PD households (for Greater Adelaide vs Rest of State) was obtained for 2020 from the ABS data '3236.0 Household and Family Projections, Australia, 2016 to 2041' (https://www.abs.gov.au/statistics/people/population/household-and-family-projectionsaustralia/2016-2041). The proportion of PDs in each SA3 was obtained from the '2016 Census of Population and Housing, General Community Profile' (Table G32: https://www.abs.gov.au/census/find-census-data/community-profiles/2016/0) and applied to the 2020 PD total to get estimates of PDs in each SA3 for 2020 (Appendix 7).

Each SA3 within Greater Adelaide (SA3s 40101 to 40403) had a sample fraction of 0.035 applied, while SA3s in the rest of the State (SA3s 40501 to 40703) had a higher sample fraction of 0.062. This ensured a suitable sample size was obtained from those regional SA3s of lower population density. A total of 29,860 households (with unique addresses) was obtained from SamplePages.

A maximum of 1 landline and 1 mobile number was obtained for each household, with 21% of households in the sample having both, while for 36% a landline number only was provided, and 43% a single mobile number provided. Sampling was undertaken without replacement for sample loss (e.g. disconnected numbers, non-private dwellings). For analysis and reporting purposes, SA3s were pooled up to Statistical Area Level 4 (SA4) level, with sampling at the SA3 level ensuring each SA4 stratum had representative coverage.

The screening survey was conducted during February and March 2021 by a Q&A Market Research. To minimise non-contacts, up to 10 calls were made to each telephone number, and invalid numbers (e.g., disconnected, business and facsimile numbers) were treated as sample loss and not replaced. Within each responding household, the following was established: demographic profiles (i.e., age group, gender, highest level of education and country of birth) of all usual residents, involvement in recreational fishing over the previous 12 months and likelihood (expectation) of doing any recreational fishing in the following 12 months was established for residents aged five years or older. All respondents who had fished during the 12 months prior to interview were asked whether they had fished in fresh and/or saltwater (including estuaries) in SA, whether they had fished interstate, and to estimate how many days they had fished in the previous 12 months (used to index avidity). Fishers were broadly classified according to their fishing avidity as infrequent (1-4 days), occasional (5-14 days) and regular (≥15 days) based on the number of days reported. All households in which at least one member (regardless of prior fishing history) expressed a likelihood of fishing during the following 12 months were considered eligible for the diary phase of the study.

#### 2.1.3. Diary survey

All households identified as eligible for the diary survey were invited to participate in this phase of the study. For households that agreed to participate, fishing activity of each household member aged five years and older was monitored between 1 March 2021 and 28 February 2022, inclusive. Responses for children aged 5–17 were either provided on a 'proxy' basis by a parent or caregiver, or where it was deemed appropriate, parental permission was provided for children to participate.

Participants were provided with a diary kit which included the diary, a colour species identification guide to common SA species and a survey cover letter. A brief interview was conducted to explain the survey requirements and to schedule the next contact. Respondents were encouraged to record basic information in their diaries, such as trip date, fishing location, start and finish times, and retained and release numbers of each species encountered. More detailed information, such as target species, fishing method (Table 2.1), platform (Table 2.2), water body type (Table 2.3), and reason(s) for release were collected for each individual fishing event and recorded during the interviews. Interview schedules were determined based on levels of fishing activity, with contact generally made at least once a month, even if no fishing activity was planned. Interviews were designed to capture data within a couple of weeks of any fishing activity, to reduce the potential recall bias and providing opportunity to clarify ambiguities and ensure completeness of information.

While charter boat catch was estimated as a part of this survey, it is important to note that licensed operators have been required to fill out trip logs which report daily catch and effort since 2005 (Jones 2009). For consistency with the previous reports, the charter boat catch is included in the total recreational catch estimates presented in this report.

| Group                             | Category                              |  |
|-----------------------------------|---------------------------------------|--|
| Crab net                          | Drop or hoop net (crab net)           |  |
| Cray pot                          | Cray pot                              |  |
|                                   | Cray ring                             |  |
| Dab/ scoop net                    | Net - scoop/ push                     |  |
| Diving/ Spear                     | Other diving - scuba/ surf/ air       |  |
|                                   | Other diving - snorkel                |  |
|                                   | Other spearfishing - surface          |  |
|                                   | Spearfishing - diving                 |  |
| Gill/ drag net                    | Net – cast/drag                       |  |
|                                   | Net - gill/ set                       |  |
| Hand Collection                   | Cockle net                            |  |
|                                   | Crab rake                             |  |
|                                   | Hook/ pump/ spade                     |  |
|                                   | Other hand collecting                 |  |
| Line                              | Lines - bait                          |  |
|                                   | Lines - both                          |  |
|                                   | Lines - lure/ jig/ fly / soft plastic |  |
|                                   | Lines - set (passive)                 |  |
| Yabby/Shrimp pot (incl. trap/net) | Shrimp net/trap                       |  |
|                                   | Yabby Net                             |  |
|                                   | Yabby Pot (opera house)               |  |

Table 2.1. Gear types allocated to each fishing method groups

Table 2.2. Fishing platforms allocated to the boat and shore groups

| Group | Category                   | Description  |
|-------|----------------------------|--|
| Boat  | Hire<br>Charter<br>Private | All types of watercrafts e.g.,<br>powerboats, canoes, kayaks,<br>yachts/sailing boats, jet skis and<br>houseboats. |
| Shore | Natural<br>Man-made        | Beaches, banks of rivers, streams<br>or dams<br>Public Wharf or jetty  |

| Table 2.3. Waterbodies allocated to | freshwater and saltwater groups |
|-------------------------------------|---------------------------------|
|-------------------------------------|---------------------------------|

| Waterbody | Туре                 | Description   |
|-----------|----------------------|---|
| Inshore   | Saltwater            | Marine waters (<5km from shore)                                     |
| Offshore  | Saltwater            | Marine waters (>5km from shore)                                     |
| Estuary   | Saltwater            | Partially enclosed waterbody  |
| River     | Freshwater           | Natural flowing watercourse   |
| Lake/Dam  | Freshwater/Saltwater | Enclosed water body– private or public.<br>Includes the lower lakes |

#### 2.1.4. Non-intending fisher call-backs

A random sample of households which, at screening, indicated no likelihood to go fishing during the survey period (i.e., not eligible for the diary survey) was re-contacted close to the end of the survey period (February–April 2022). The interview aimed to establish whether fishing had occurred during the survey period (by any household member five years or older) and whether there had been a change in household (e.g., re-allocated telephone number, change to household members). If fishing was reported, information was collected on household demographic profile (e.g., age group and gender), and whether individual members had fished in SA and/or interstate, in salt and/or freshwater, and number of days fished during the 12 months of the survey period. Respondents who were identified as not being residents of the household at the time of screening were excluded from the analysis.

#### 2.1.5. 'Wash-up' survey

At the end of the survey period, a randomly selected sub-sample of diarists were offered a structured questionnaire seeking information about motives, attitudes and experiences related to recreational fishing. The 'wash-up' survey was typically conducted with the main fisher or diary reporter in each household and was administered by telephone between March 2022 and June 2022. Firstly, the interviews aimed to confirm that fishing information recorded on the database for each household member was complete (days fished reported during the survey period), and to document the reasons for any changes in fishing activity levels compared to the 12 months prior to the survey period (constraints or opportunities). The secondary aim was to examine motivations, attitudes and awareness of a selected household member, typically the main fisher or diary reporter, to issues relevant to the recreational fishery. This survey was conducted with respondents aged 18 years and older. Where the only

12

recreational fisher in the household was less than 18 years old, an abbreviated interview confirming fishing information was conducted. This was either through a 'proxy' or parental permission was provided for the child to participate.

To quantify the importance of recreational fishing motivations, respondents were asked to rate ten motivational items as 'not at all important', 'not very important', 'quite important', or 'very important'. For analysis, motivational items represented both catch and non-catch aspects of the recreational fishing experience and were classified on an importance score scale, ranging from 1 (not at all important) to 4 (very important).

# 2.2. Regions

# 2.2.1. Sampling strata

Initial household selection (i.e., telephone number) was based on a stratified random sample design using the Australian Statistical Geography Standard (ASGS) SA4 regions as strata (Fig. 2.2). Household and population characteristics data were analysed at stratum and State-wide levels.



Figure 2.2. Map of South Australia showing Australian Bureau of Statistics Statistical Areas (colour coded) used for sample stratification.

#### 2.2.2. Fishing regions

During the diary survey, interviewers classified the location of each fishing activity (event) into one of 16 fishing regions, which included eight marine regions and six freshwater/estuarine regions (Fig. 2.3). All inland fishing activity outside of the Lower Lakes, Coorong and River Murray was classified as "inland". The reported fishing location was also recorded in the database, both to validate the allocated fishing region and to provide added flexibility in future analyses. Other fishing location information was also collected in the diary survey based on waterbody type: marine waters greater or less than 5 km from the coastline; estuarine waters; freshwater rivers; and freshwater lakes/dams (public or private).



Figure 2.3. Map of South Australia showing analysis regions used for reporting fishing activities. The grid represents the Marine Fishery Areas (MFAs) that are a spatial scale used for reporting by the Marine Scalefish Fishery. Inset – map of Australia showing the study region

#### 2.3. Fishing effort

During the 2021–22 survey period, information of the level of fishing effort was collected for each fishing event, where an event was defined as a discrete fishing episode by one or more household member. Where there was a change in fishing region or water body type, target species and/or fishing method, a separate fishing event was defined, resulting in multiple 'events' per fishing trip. For example, a fisher may set a pot for Southern Rock Lobster and then go line fishing for King George Whiting, with each activity considered a separate event. Effort was presented by fishing method, target species/fishery, and defined by either fisher days (i.e., separate days on which some form of fishing was undertaken by a fisher), fishing events, or hours fished. Where fishing events spanned multiple days, only days of 'active' fishing were counted, i.e., when pots or nets were hauled.

#### 2.4. Catch

The recreational fishing limits brochure, which includes clear colour images, was provided to all diarists to optimise the accuracy of species identification in the survey. In addition, a species identification guide was provided with additional information for commonly mis-identified species including whiting (e.g., silver, school and yellowfin), Australian Herring, Western Australian Salmon (adults and juveniles or salmon trout), squid (e.g., Southern Calamari and Arrow Squid), and shark (e.g., gummy, school, bronze whaler and dusky). Ideally, species were identified at the highest resolution possible, however, in some instances, species groupings were required (i.e., where fishers could not reasonably be expected to delineate species, even with the aid of the identification booklets). For example, iconic species such as Southern Garfish were readily recognisable whereas identification to species level for the flathead (e.g., blue spotted, sand or tiger) was less certain, even though flathead could be readily distinguished from other groups of fish.

For the purpose of reporting catches, individual species (e.g., Australian Herring, King George Whiting) or taxonomic groupings (e.g., flathead, leatherjacket) have been used in most instances. Nonetheless, several species or species groups were represented by very few records and therefore it was necessary to pool them into broader taxonomic categories for analysis (e.g., 'rays/skates', 'other perch'). A listing of taxa reported and the catch analysis groupings are provided in Appendix 1.

Catches were reported as the number of individuals retained (harvested) and number released (including discards, i.e., the component of the catch that is released or returned to the water

after capture) by species. In a small number of instances, respondents reported catches of small and generally abundant 'bait' taxa (e.g., Worms) in units of weight or volume.

## 2.5. On-site sampling

Catch information was reported based on number (rather than length or weight) during the survey period. The rationale for this approach was that estimates of length or weight tend to be less reliable when self-reported. However, to enable comparisons with commercial data (generally reported as weight), recreational harvests were also reported by approximate weight. This was achieved by multiplying the number of individuals caught by the average weight of the species. Where possible, regional and seasonal estimates of length were used to estimate harvest weight, but low sample sizes prevented this for many regions. Details on the calculations of average weights are described in Appendix 2 and Jones 2007.

On-site sampling was conducted at boat ramps and other access points to collect length data for species harvested in recreational fishing activities. The sampling program was designed to be opportunistic, targeting peak periods of recreational fishing activity to maximise interviews with anglers. Length distribution was collected during daylight hours over 114 sampling days, in 40 locations between 21 March 2021 and 26 February 2022 and included all fishing regions and seasons (details in Appendix 3). On each sampling day, fishers were approached by creel clerks at the end of a fishing trip and were asked about the location of the fishing activity, water body fished (e.g., inshore or offshore), and the gear types used. The catch was then identified to species level and measured with the consent of the fishing party. For large catches, a representative subsample of the catch was measured for each species.

For all finfish species (except for Garfish), length was recorded as total length (i.e., generally from the tip of the snout to the tip of the longest lobe of the caudal fin). Garfish were measured from the tip of the upper jaw to the bottom tip of the tail. Sharks were measured from between the 5th gill slit and the base of the tail, while skates and rays were measured across the body from wing tip to wing tip. All shellfish (except Razorfish) were measured as to their shell width (i.e., across widest part of shell using vernier callipers), while shell length was recorded for Razorfish (i.e., the greatest distance between the shell tip and end). All cephalopods (except octopus) were measured as to their mantle length (i.e., along the dorsal midline from the mantle margin to the posterior tip of the body, excluding long tails.). Octopus length was measured as mantle length and total length. All crabs (except Giant Crabs) were measured as to their carapace width (i.e., across the carapace from the base of the largest spine).

Southern Rock Lobster were measured as to their carapace length (i.e., the groove between the antennae, and the other at the back edge of the carapace).

The number of interviews conducted in each region and season, the total number of individuals measured, and length distributions are presented in Appendix 4. Weight-length relationships used to estimate species weight are presented in Appendix 5. On-site sampling to support the 2021–22 Recreational Fishing Survey was reviewed and approved by the University of Adelaide Human Research Ethics Committee HREC 2021–034.

#### 2.5.1. Harvest weights estimates

To estimate recreational harvest weight for each species, a State-wide average weight from on-site sampling was calculated. Where data were available, a similar approach was used to estimate harvest weights at the regional and stock levels. Due to differences in stock/regional areas and availability of weight data from on-site sampling for each species, average weights were recalculated when necessary, using the values provided in Appendix 6. This approach allowed the matching between limited on-site weight data and catch data from the commercial sector at important scales and resulted in the most reliable harvest weight estimate for each species and region of interest. When data were available, final standard errors of harvest weights estimates incorporated both variances of average species weight (from on-site sampling) and harvest numbers (from phone survey estimates).

Harvest weights were compared to commercial catches at State-wide, stock, and regional levels. Commercial catches were compiled with data reported between March 2021 and February 2022 from the Marine Scalefish Fishery, Lakes and Coorong Fishery, Blue Crab Fishery, Rock Lobster Fishery and Abalone Fishery. When the combined number of licence holders were less than five, data were omitted due to confidentiality restrictions under the *Fisheries Management Act 2007*.

#### 2.6. Data expansion

Data analysis was based on a stratified random survey design using single stage cluster sampling (see section 2.1.1). The private dwelling household represented the primary sampling unit and residents within the household represented the secondary sampling units. Household and individual expansion factors (to expand catch and effort estimates from the sample to the resident population) were determined under an integrated approach which adjusted for non-response and calibrated against population benchmarks (Lyle *et al.* 2010).

Adjustment for non-response was implemented through response propensity modelling that considered the probability of response given the households fishing activity. Those households that refused to complete the screening interview but answered the first question of the survey about whether household members had fished in the previous 12 months were used to represent all non-responders. Initial weights of responding households were adjusted for this non-response, while preserving the strata totals (see Lyle *et al.* 2010 for further details).

Survey data were calibrated to SA4-level population totals of occupied private dwellings, and the number of persons within these OPDs by gender, age group, country of birth and education level obtained from the ABS 2021 Census (Appendix 7), and the phase 2 sample of completed diary households calibrated to the screening population of intending fisher households (to account for those households that intended to fish but didn't consent to, or withdrew from, the diary survey). The calibration step also forced estimates of participation during the diary period to match those obtained from a separate analysis incorporating the Non-intending fisher survey results.

Not all eligible fishers fished during the survey period and they represented unexpected 'dropouts' from the fishery. Similarly, unexpected fishing activity was likely to occur, representing 'drop-ins' to the fishery. In order to obtain more accurate estimates of participation that account for both drop-ins and drop-outs, a separate analysis was conducted utilising the subset of nonintending households that completed the 'Non-Intending Call-back' survey, with recalled avidity adjusted for bias (Lyle *et al.* 2010). Estimates of participation by avidity grouping were then calibrated to in the main analysis (see Lyle *et al.* 2010 for further detail).

Unless otherwise indicated, parameter estimates provided in this report are based on expanded data, scaled-up to represent the *resident PD population of South Australia* rather than the sample from which they were derived.

#### 2.6.1. Statistical uncertainty

Surveys are not designed to sample the entire population of interest, rather a representative subset of the population. This means that all parameter estimates have some statistical uncertainty due to sampling error, and estimates may differ from those that would have been produced had the entire population been surveyed. This uncertainty can be expressed in terms

of standard error (SE)<sup>1</sup>, which indicates the extent to which the estimate might have varied from the true population value due to chance. The relative standard error (RSE)<sup>2</sup>, which is the uncertainty expressed as a percentage of the estimate, is also presented in this report to allows for comparisons between estimates, considering the differences in the magnitude of estimates. Standard error estimates provide a measure of precision and are typically influenced by the sample size, variability in the population, survey design and the estimation method used. It should be noted that as survey data are disaggregated, for example by region or method, SEs expressed as a percentage of the estimate (RSE) will increase and there may become a point where the disaggregated estimates become less precise because of excessively large variance.

When interpreting survey estimates, consideration needs to be given to the magnitude of the RSE and the actual number of households that contributed records to the estimate. Estimates with RSEs of greater than 40% (implying a 95% confidence range of  $\pm$  80% of the estimate) have been highlighted (bold) and are regarded as imprecise. Estimates derived from records involving fewer than 30 households have also been highlighted (italic) since they may not be representative.

#### 2.7. 'Wash-up' survey

A summary of responses to key questions from the 'wash-up' survey are presented. Note that data from the 'wash-up' survey were not extrapolated to account for fishers not included in the survey. The 'wash-up' analysis examined how demographics and experience influenced responses, respondents were stratified by four grouping factors: age (5-14 years, 15-29 years, 30-44 years, 45-59 years, 60-74 years and  $\geq$ 75 years); residence (ASGS SA4 areas - Adelaide-North, Adelaide-West, Adelaide-South, Adelaide-Central and Hills, Barossa-Yorke-Mid North, South East, and Outback); avidity (days fished during 2021–22 – 0 days, 1–4 days, 5–9 days, 10–14 days, 15–19 days and  $\geq$ 20 days); and water body fished (saltwater only, freshwater only, both fresh and saltwater). Age and residence were based on information provided in the screening phase, while avidity and water body fished were based on information provided by respondents during the diary survey.

<sup>&</sup>lt;sup>1</sup> The standard error (SE) is calculated from the standard deviation of the sample divided by the sample size.

<sup>&</sup>lt;sup>2</sup> The relative standard error (RSE) is calculated from the standard error of the sample divided by the estimate.

Participants were asked to rate the importance of several motivations to go fishing, from "very important" (1) to "not at all important" (4). To allow comparisons with previous surveys, motives were grouped into five categories: 1) relaxation ("to relax or unwind" and "to be on your own ... to get away from people"); 2) social ("to spend time with family" and "to spent time with other friends"); 3) environment ("to be out doors ... in the fresh air ... to enjoy nature"); 4) catch ("for the enjoyment or sport of catching fish, lobsters, etc", "to catch a trophy-sized fish" and "to compete in fishing competitions of any kind"); and 5) consumption ("to catch fresh fish, lobsters, etc for food" and "to catch fish to share with friends and family").

Main motives were also identified and analysed. When a single main motive could not be identified, respondents were recognised as having multiple main motives for fishing. The motive with the highest importance score from an individual's response was identified as the primary motive for fishing. When more than one motive received the highest importance score, respondents were asked to indicate the motive that best represented their main reason for fishing.

The degree to which fishers value each catch-related aspects of recreational fishing activities was evaluated according to four experiential components of consumptive orientation: (1) catching something as a factor contributing to a satisfying fishing experience; (2) catching numbers of fish; (3) catching large fish; and (4) retaining fish. Two other elements were included in the present study: (5) catching a variety of fish, and (6) consuming the catch. Respondents indicated the level of agreements to each one of the fifteen statements pertaining the six elements (groups), using a scale from 1 (strongly disagree) to 5 (strongly agree), with 3 being neutral (neither agree nor disagree).

The effect of each of the grouping factors on responses to types of motivations and value attributed to fishing was explored with Kruskal-Wallis tests using the 'kruskal.test' function in base R. Where significant differences were identified, post-hoc pairwise comparisons were made with the Wilcoxon signed rank test using the 'pairwise.wilcox.test' function in base R with alpha values corrected for multiple pairwise comparisons with the Benjamini and Yekutieli method (Benjamini and Yekutieli 2001). Level of statistical significance was set at  $\alpha = 0.05$ .

# 3. RESULTS

# 3.1. Sample and response profiles

#### 3.1.1. Screening survey

The number of occupied private-dwelling households in SA as of June 2021 (modified from ABS Census 2021 data), sampling details and the response profile relating to the screening survey are summarised in Appendix 8. Since sampling was undertaken without replacement for sample loss (e.g., disconnected numbers, non-private dwellings including businesses, nursing homes, numbers no longer in SA, etc), the gross sample was reduced from 29,860 to 27,694, of which 4,925 households (18%) fully responded to the screening survey. Response rates were generally consistent across all sampling strata.

Non-response was due to non-contacts (58%), refusals (23% overall), and other non-response (<1%), such as language or communication difficulties (Appendix 8). Within the refusal group, there were 162 partial refusals (where at least the substantive question relating to previous household fishing was answered), the remainder were full refusals where no information was provided. For most of these full refusals (63%), respondents refused or simply hung up before any introductions or background to the survey were provided, suggesting the reason for the refusal was unrelated to the subject matter (fishing). The remainder of the refusals, , had been made aware of the subject matter and were used for subject (fishing) response bias adjustment (Section 2.6). As for un-informed refusals, no inferences about potential subject matter bias can be made from non-contacted households. Declining response to unsolicited phone calls and unfamiliar phone numbers through call-screening or hang-ups, represents a growing challenge in Australia and internationally when conducting telephone-based surveys.

#### 3.1.2. Diary survey

Of those households identified at screening as having at least one resident with an intention to do some recreational fishing during the survey period (March 2021 to February 2022), 39% fully responded to the diary survey (Appendix 9). In total, 1,019 SA households, representing 2,751 persons aged five years and older, completed the diary survey, with response rates consistent across all strata. Fully responding households reported a total of 5,551 fishing events.

Based on households which initially agreed to take part in the diary survey (n = 1,578), the effective diary completion rate was 65%. Diary completion rates were higher than the 2013– 14 survey (53%), but were lower than the 2007–08 (91%) and 2001–02 (84%) surveys (Henry and Lyle 2003, Jones 2009, Giri and Hall 2015).

#### 3.1.3. Non-intending fishery call-backs

Approximately 35% of the 3,347 households that indicated no intention to go fishing during the survey period were selected at random to be followed up at the end of the survey period to ascertain whether any unexpected fishing had occurred (Appendix 10). When sample loss (disconnected numbers) was considered, an overall response rate of about 65% was achieved for this segment of the study, with consistently high response rates for each of the strata. Within the response group, approximately 50 households (4.2% of the initial sample) were established to represent different households to those at the time of screening and therefore excluded, and 46 households (6.4% of responding households) reported that at least one member had done some ('unexpected') fishing during the survey period.

#### 3.1.1. 'Wash-up' survey

Of the 1,019 completed diarist households, a sub-sample of 840 (82%) were selected for the 'wash-up' survey. Of these, 706 (84%) completed the 'wash-up' survey, 11 (1%) were non-contacts, 98 (12%) refused the survey, and 25 (3%) represented some form of non-response (predominantly partially completed interviews).

## 3.2. Fisher characteristics

The following analyses are based on information derived from the screening survey and are expanded, with non-response adjustments, to represent the resident private dwelling population of SA aged five years or older.

#### 3.2.1. Participation rates

The screening survey established that an estimated 356,708 (SE = 10,843) SA residents aged five years or older fished in SA at least once in the 12 months prior to March 2021, representing a participation rate (proportion of resident population) of 23% (SE = 1%, Appendix 11). Inclusion of SA residents who only fished in other states of Australia during that period increased the total number of recreational fishers to 360,108 (SE = 10,850). Unless stated otherwise, subsequent analyses exclude those residents who fished exclusively outside of SA.

About 23% of fishers resided in the North of Adelaide, 19% in the South of Adelaide, and nearly 17% in the Central and Hills region (Appendix 11). A further 14% resided in the South-East and 8–10% in each of West Adelaide, Barossa-Yorke-Mid-North, and Outback statistical areas (Fig. 3.1A). Participation rates were higher than the State-wide average (23%) in regional areas including the Outback (44%), Barossa-Yorke-Mid North (30%), and South-East (30%). Participation rates were lowest for West of Adelaide (15%), and relatively consistent (20–22%) across the North and South of Adelaide, and Central and Hills (Fig. 3.1B).



Figure 3.1. Recreational fishing participation in South Australia during the 12 months prior to March 2021 by region of residence for fishers aged five years or older: A) Number of fishers; and B) proportion of the resident population. Error bars represent standard error, and the dotted line represents the overall participation rate.

# 3.2.2. Age and gender

Recreational fishing was more popular among males than females, with 30% of males and 16% of females aged five years or older having fished in SA during the 12 months prior to March 2021. By number, 45% more males than females undertook some form of recreational fishing.

The prominence of males involved in fishing was evident across all age groups (Fig. 3.2) and by region of residence. The number of males who fished was relatively consistent for those aged 5–14 and 15–29 year-old, with larger numbers of fishers for the older age groups (Fig 3.2A). Male participation rates were highest for the 5–14 year-old age group and lowest for the oldest age group. The number of females who fished was relatively similar across all age groups, the exception was the oldest age group which had the lowest number of fishers. Female participation rates were highest for the youngest age group, and lowest for the oldest age group (Fig 3.2B). Overall, the greatest number of fishers were in the 45–59 year-old age group, with the highest participation rate in the 5–14 year-old age group.


Figure 3.2. Fishing participation in the 12 months prior to March 2021 by age group and gender by SA residents aged five years or older: A) number of fishers; and B) proportion (%) of the resident population. Error bars represent standard error.

# 3.3. Fishing effort

The following analyses are based on information derived from the diary survey and are expanded, with non-response adjustments and adjustments to account for unexpected fishing by non-intending fisher households, to represent the activities of the resident private dwelling population of SA aged five years or older. Effort is primarily described as 'fisher days', noting that a fisher day can be disaggregated by region, water body type, platform and/or method.

## 3.3.1. Number of fishers and days fished

It was estimated that 297,244 (SE = 12,946) SA residents fished at least once during the survey period (i.e., 1 March 2021 to 28 February 2022) (Table 3.1). This was 17% lower than the number of persons estimated to have fished in the 12 months prior to the survey period, as determined from the screening survey (n = 356,708 fishers). However, as the screening survey was based on recalled activity, it is likely that the estimate may have been subject to recall and other biases. This may include overestimation of fishing activity due to reporting outside of the period of interest (known as telescoping).

In terms of effort, SA residents accounted for 1,305,323 (SE = 94,439) fisher days of effort during the 12-month survey period (Table 3.1). Overall, 25% of fishers fished at least once in freshwater while 86% fished at least once in saltwater, with 17% of the effort (fisher days) involving freshwater fishing and 83% fishing in saltwater.

Table 3.1. Estimated number of fishers and days fished by SA residents aged five years or older who fished in freshwater and saltwater in SA from 1 March 2021 to 28 February 2022. SE is standard error.

| Effort      | Fresh   | water  | Saltwater |        |  |
|-------------|---------|--------|-----------|--------|--|
|             | Number  | SE     | Number    | SE     |  |
| Fishers     | 74,607  | 7,846  | 256,045   | 12,117 |  |
| Fisher days | 216,904 | 31,544 | 1,088,766 | 87,349 |  |

During the 12-month survey period, 73% of all fishers (216,641 persons) fished less than five days and this accounted for 33% of all days fished (428,614 days) (Fig. 3.3). While only 18% of fishers (52,231 persons) fished between 5 and 9 days, this cohort accounted for a similar proportion of effort (26%) to those who fished less than 5 days. Those who fished ≥20 days (7,114 persons) made up a relatively small proportion of the overall fishers (2%), however, their contribution to overall effort was high (20%; 261,784 days). Fishers who fished between 10 and 14 days contributed a similar amount of effort (205,877 days) to those who fished ≥20 days per year, although the number of fishers in this category was more than double. Those who fished between 15 and 19 days constituted only 1% of all fishers (4,013 persons) and

contributed only 5% of the overall effort (67,704 days). The average number of days fished was 4.4 (± 0.3 SE) days per person for the survey period.

The impact of individual fishers on total fishing effort was examined by ranking fishers based on annual fishing effort (days fished) and calculating the cumulative fisher effort (Fig. 3.4). From this relationship it was evident that during the 2021–22 survey period, 49% of the effort was accounted for by the top 20% of fishers (highest ranked in terms of days fished). Comparatively, a lower proportion of effort (44%) was accounted for by the top 20% of fishers in 2013–14 (Giri and Hall 2015), and a higher proportion of effort (56%) was accounted for by the top 20% of fishers in 2007–08 (Jones 2009).



Figure 3.3. Individual fishing effort by South Australian residents aged five years or older fishing in South Australia from March 2021 to February 2022: A) number of fishers, and B) days fished. Error bars represent standard error.



Figure 3.4. Relationship between the number of fishers and their cumulative fishing effort (% of days fished) for SA residents aged 5 years or older in SA from March 2021 to February 2022. Closed dots (•) are data points, blue (2007–08), red (2013–14), and black (2021–22) reference lines indicate the proportion of effort accounted for by 80% of fishers.

### 3.3.2. Water body

An important feature of the SA fishery was the concentration of fishing effort in inshore coastal waters (76% of fisher days) and rivers (14% of fisher days) (Fig. 3.5, Appendix 12).

Comparatively little fishing effort was directed in waters greater than 5 km offshore (4%), estuaries (3%) and lakes/dams (3%.



Figure 3.5. Fishing effort (fisher days) by water body type for SA residents aged five years or older who fished in SA from March 2021 to February 2022. Error bars represent standard error.

### 3.3.3. Fishing method

Line fishing (including the use of bait and/or artificial lures and jigs) was by far the dominant fishing mode in SA, accounting for 75% of all fisher days (Fig. 3.6, Appendix 13). Overall, line fishing accounted for 1,092,805 fisher days or 4 million fisher hours of effort, equating to an average of 3.7 hours per line fishing trip. The next most popular fishing method was the use of crab nets (11% of fisher days), followed by cray pots (6%), hand collection (4%), and yabby pots (4%).



Figure 3.6. Fishing effort (fisher days) by fishing method for SA residents aged five years or older who fished in SA from March 2021 to February 2022. Error bars represent standard error.

### 3.3.4. Fishing region

Just over half of the State's total fishing effort (fisher days) was focused in Gulf St Vincent and Spencer Gulf (34% and 25% of the total effort, respectively) (Table 3.2). The southern gulfs accounted for a higher proportion of the effort, with Gulf St Vincent and Kangaroo Island (GSVKI) accounting for 20% and Southern Spencer Gulf (SSG) accounting for 14%. The Far South-East region attracted 9% of the overall effort, with a further 5% in the South-East. Overall effort in the River Murray was 13%, with most effort in the mid- and upper Murray. The West Coast and Lower Eyre Peninsula attracted 8% and 3% of the effort, respectively. Effort was low in the remaining regions with approximately 1% in the Lower Lakes and Coorong Lagoon, and less than 3% for Inland and the remainder of SA.

The significance of GSVKI as a recreational fishing area was evident from the amount of effort (262,740 fisher days) and the number of fishers (n = 86,969) estimated to have accessed the region (Appendix 14). Northern Gulf St Vincent (NGSV) and SSG were also popular, with over 62,000 persons estimated to have fished in each region during the survey period. Most of the regional effort could be attributed to residents from nearby areas (Table 3.2). However, a considerable amount of effort (>10% of the regional effort) was expended by Adelaide-North and residents in Spencer Gulf and the Murray River, by Adelaide-South residents in Spencer Gulf and the Murray River, by Adelaide-South residents in Spencer form a single SA4 adjacent to the fishing region).

|  | Central and<br>Hills | Adelaide<br>North | Adelaide<br>South | Adelaide<br>West | Barossa-<br>Yorke-Mid<br>North | Outback | South-East | Total     |
|--|----------------------|-------------------|-------------------|------------------|--------------------------------|---------|------------|-----------|
| Southern and Northern<br>Spencer Gulf  | 29,151               | 55,726            | 41,323            | 15,502           | 67,752                         | 93,008  | 15,440     | 317,901   |
| West Coast and Lower<br>Eyre Peninsula | 9,997                | 19,807            | 33,520            | 3,908            | 12,348                         | 53,550  | 10,154     | 143,284   |
| Gulf St Vincent and<br>Kangaroo Island | 64,760               | 143,734           | 107,801           | 36,579           | 51,545                         | 1,198   | 34,126     | 439,743   |
| South-East and<br>Far South-East       | 24,889               | 5,099             | 17,846            | 4,889            | 8,552                          | 721     | 123,867    | 185,863   |
| Lower-, Upper- and<br>Mid-Murray River | 9,753                | 65,915            | 15,828            | 6,976            | 13,444                         | 1,885   | 61,290     | 175,090   |
| Lower Lakes and<br>Coorong Lagoon      | 375                  | 551               | 11,244            | 519              | 367                            | -       | 328        | 13,385    |
| Total                                  | 138,925              | 290,832           | 227,561           | 68,373           | 154,009                        | 15,0361 | 245,206    | 1,275,267 |

Table 3.2. Fishing effort (fisher days) by residential area (columns) and fishing area (rows).

#### 3.3.5. Fishing platform

Shore-based activities dominated fishing effort at the State-wide scale (58% of fisher days), although there were considerable differences in the relative proportion of shore- and boatbased effort by water body (Fig. 3.7). Shore-based fishing effort was 17% higher than boatbased in the marine environment and shore-based effort was more than 3 times greater than boat-based effort in the freshwater environment (Fig. 3.7A). The vast majority (>96%) of boatbased fishing events occurred from privately owned vessels, with charter boats (2%) and hirevessels (2%) making up the remaining boat-based effort (Fig, 3.7B). Shore-based effort was primarily split between beach/rocks (44%) and public wharves/jetties (42%), with other shorebased locations such as riverbanks, boat ramps and footbridges accounting for the remaining platforms (14%).



Figure 3.7. Fishing effort (fisher days) for SA residents aged five years or older who fished in SA from March 2021 to February 2022 by A) water body and B) fishing platform. Error bars represent standard error.

## 3.4. Catches

The following results are based on information derived from the diary survey and are expanded and adjusted (for non-response and unexpected fishing by non-intending fisher households) to represent the activities of the resident private dwelling population of SA aged five years or older. For the purposes of reporting and analysis, some species have been grouped (typically at the family level). A listing of all species and their relative occurrence by fishing method, along with a listing of the taxa that comprise each of the reporting groups, is provided in Appendices 15 and 1.

### 3.4.1. Total catch, retained, and released

An estimated 4.5 million marine finfish (bony and cartilaginous fish) were caught by South Australian recreational fishers from March 2021 to February 2022. The most frequently caught species was King George Whiting which accounted for 40% of all marine finfish captured (1.83 million fish), followed by Australian Herring (648K individuals or 14%), Southern Garfish (328K or 7%), Western Australian Salmon (280K or 6%), Striped Perch (246K or 5%), and Yellowfin Whiting (200K or 4%) (Table 3.3).

An estimated 4.9 million marine invertebrates were caught throughout the survey period, the most frequently caught were Blue Swimmer Crab (2 million or 41%), pipi (1.7 million or 35%) and Southern Calamari (574K or 12%) (Table 3.4). Other invertebrate species of significance included Southern Rock Lobster (126K), Mud Cockles (118K), other Cockles (157K) and Razorfish (95K). A further 1.4 million freshwater fish and invertebrates were caught which was primarily composed of Freshwater Yabby (947K or 64%), Freshwater Shrimp (282K or 19%) and Carp (150K or 10%).

In total, 2.7 million marine finfish and 3.1 million marine invertebrates were retained, indicating that over half of all marine finfish (59%) and invertebrates (64%) caught were harvested (Table 3.3 and 3.4). King George Whiting (1.1 million fish or 42% of retained marine finfish), Australian Herring (452K or 17%), Southern Garfish (265K or 10%), and Western Australian Salmon (154K or 6%). Marine invertebrate catch was mostly pipi (1.1 million), Blue Swimmer Crab (921K), and Southern Calamari (550K). A further 1.1 million freshwater fish and invertebrates were retained, with Freshwater Yabby (714K), Freshwater Shrimp (194K), and Carp (149K) making up most of the harvest.

Overall, 1.8 million marine finfish (41%) and 1.7 million marine invertebrates (36%) were released. Release rates differed between species (Table 3.3 and 3.4). High release rates (>70%) were reported for Snapper, Black Bream, and a range of other bony fishes (mostly

reef associated), and various sharks, rays, and skates. Very low release rates (<10%) were reported for School Shark, Mackerel (unknown spp.) and Snook, while many invertebrate species (e.g., Blacklip Abalone, Southern Calamari, Cockle (unknown spp.), Razorfish and Arrow Squid) also had very low release rates. High release rates (>70%) were reported for many protected freshwater species (e.g., Freshwater Catfish, Murray Cod), while very low release rates (<10%) were reported for Redfin Perch and Carp.

### 3.4.2. Reasons for release

Based on terminology used by the respondent, the following release categories were identified: 'too small' - implying that the fish or other aquatic taxa was too small to be retained (not necessarily due to minimum legal length regulations); 'undersized' – implying some knowledge and adherence to minimum legal length regulations; 'catch and release' – implying a voluntary release ethic associated with either sport fishing or conservation (no inference about fish size); and 'too many' – implying a catch number in excess of needs (note, while 'over the bag limit' was a reporting category there were very few instances where this was an identified reason, for analysis such responses have been treated as the same as 'too many'). Other reasons for release included poor eating qualities, "did not want", damaged or poor quality, and prohibited species.

Being too small or undersized, partly due to the minimum legal length, was the primary reason for release of many regulated species including Western Australian Salmon, Bight Redfish, Flathead, King George Whiting, Mulloway, Sweep, Southern Garfish, Scallop, Snook, Trevally, Yellowfin Whiting, Yellowtail Kingfish, Blue Swimmer Crab, Sand Crab, Greenlip Abalone, Mud Cockle, Pipi, Southern Rock Lobster, Black Bream, Golden Perch, Flounder, School Whiting, Southern Calamari, Freshwater Yabby and Redfin Perch (Fig. 3.8). The only species for which 'catch and release' was identified as an important motivation were Murray Cod and Trout. Several species were identified by respondents as having poor eating qualities and therefore not retained, these included Wrasse, Red Mullet, Leatherjacket, Cod (incl. red rock cod), Weedy Whiting, Striped Perch, Cuttlefish, Port Jackson Shark, Toadfish/Pufferfish, and Carp. Quantity of fish was an important factor for release for Southern Bluefin Tuna, partly in response to bag limits. Freshwater Shrimp were also frequently released due to large numbers being caught

36

Table 3.3. Estimated annual catch (total, retained and released; by number) and proportion released for key Marine Finfish species from March 2021 to February 2022.

| Species                    | То      | tal    |         | Retained |         | Released      |      |
|----------------------------|---------|--------|---------|----------|---------|---------------|------|
| · -                        | Ν       | SE     | N       | SE       | N       | SE            | %    |
| Albacore                   | 1,464   | 1,183  | 1,464   | 1,183    | -       | -             | 0%   |
| Barracouta                 | 1,190   | 593    | +       |          | +       |               | 20%  |
| Blue Devil, Western        | 1,102   | 891    | -       | -        | 1,102   | 891           | 100% |
| Bream, Black               | 30,878  | 7,853  | 7,505   | 3,671    | 23,373  | 6,306         | 76%  |
| Cod, Unknown               | 70,596  | 27,397 | 7,181   | 2,928    | 63,415  | 26,882        | 90%  |
| Cowfish                    | 1,461   | 925    | +       |          | 1,366   | 920           | 93%  |
| Finfish, Unknown           | 5,607   | 1,594  | 1,763   | 1,285    | 3,844   | 953           | 69%  |
| Flathead spp.              | 53,868  | 12,852 | 26,620  | 5,961    | 27,248  | 7,766         | 51%  |
| Flounder                   | 5,597   | 3,067  | 2,400   | 1,429    | 3,197   | 2,441         | 57%  |
| Garfish, Southern          | 328,208 | 63,210 | 264,506 | 51,926   | 63,702  | 14,898        | 19%  |
| Gurnard spp.               | 2,105   | 1,536  | +       |          | 1,981   | 1,470         | 94%  |
| Harlequin Fish             | 1,131   | 611    | +       |          | +       |               | 85%  |
| Herring, Australian        | 648,190 | 94,724 | 452,010 | 69,165   | 196,180 | 44,977        | 30%  |
| Kingfish, Yellowtail       | 4,285   | 2,043  | 2,004   | 947      | 2,281   | 1,150         | 53%  |
| Leatherjacket              | 80,655  | 13,935 | 33,705  | 9,261    | 46,950  | 9,414         | 58%  |
| Luderick/Zebrafish         | 2,375   | 1,471  | -       | -        | 2,375   | 1,471         | 100% |
| Mackerel, Blue Slimy       | 31,291  | 15,730 | 25,575  | 11,763   | 5,716   | 4,461         | 18%  |
| Mackerel, unknown          | 1,165   | 1,114  | 1,128   | 1,042    | +       |               | 3%   |
| Morwong, Blue              | 1,388   | 670    | 1,197   | 530      | 191     | 157           | 14%  |
| Mullet, Red                | 47,914  | 13,711 | 22,285  | 6,323    | 25,628  | 11,378        | 53%  |
| Mullet, Sea                | 14,673  | 6,509  | 11,778  | 6,041    | 2,895   | 1,737         | 20%  |
| Mullet, Unknown            | 18,603  | 7,125  | 12,570  | 5,803    | 6,032   | 2,647         | 32%  |
| Mullet, Yelloweye          | 69,657  | 21,612 | 58,625  | 19,723   | 11,033  | 3,842         | 16%  |
| Mulloway                   | 3,720   | 1,243  | 1,886   | 843      | 1,834   | 782           | 49%  |
| Perch, Gurnard             | 2,379   | 2,218  | 1,260   | 1,117    | 1,119   | 1,106         | 47%  |
| Perch, Striped             | 246,486 | 56,968 | 122,745 | 44,731   | 123,741 | 31,201        | 50%  |
| Rays and Skates            | 6,690   | 1,844  | -       | -        | 6,690   | 1,844         | 100% |
| Redfish, Bight             | 38,073  | 11,431 | 25,871  | 7,934    | 12,202  | 4,256         | 32%  |
| Salmon, Western Australian | 280,069 | 46,191 | 154,613 | 30,431   | 125,455 | 27,504        | 45%  |
| Sergeant Baker             | 1,123   | 692    | +       |          | +       |               | 71%  |
| Shark, Bronze Whaler       | 1,292   | 597    | +       |          | 1,154   | 582           | 89%  |
| Shark, Dogfish             | 4,692   | 1,739  | +       |          | 4,660   | 1,739         | 99%  |
| Shark, Gummy               | 3,926   | 1,177  | 2,567   | 770      | 1,359   | 603           | 35%  |
| Shark, Port Jackson        | 14,541  | 3,814  | +       |          | 14,347  | <u>3,81</u> 2 | 99%  |

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### Table 3.3. Continued.

| Species                | То        | otal    |    | Retained |         |           | Released |     |
|------------------------|-----------|---------|----|----------|---------|-----------|----------|-----|
|                        | Ν         | SE      |    | Ν        | SE      | N         | SE       | %   |
| Shark, School          | 1,232     | 696     |    | 1,232    | 696     | -         | -        | 0%  |
| Shark, Unknown         | 2,349     | 1,167   |    | +        |         | 2,085     | 1,139    | 89% |
| Snapper                | 59,129    | 13,038  |    | 5,070    | 3,733   | 54,059    | 12,002   | 91% |
| Snook                  | 36,806    | 11,459  | :  | 34,877   | 10,748  | 1,929     | 963      | 5%  |
| Sweep                  | 32,681    | 9,849   |    | 18,482   | 7,716   | 14,199    | 6,023    | 43% |
| Toadfish               | 94,534    | 28,508  |    | 3,273    | 1,692   | 91,261    | 28,337   | 97% |
| Trevally, Silver       | 37,760    | 14,635  |    | 33,104   | 14,403  | 4,656     | 1,418    | 12% |
| Trevally, Unknown      | 11,790    | 3,483   |    | 5,964    | 2,010   | 5,826     | 2,342    | 49% |
| Trumpeter, Unknown     | 2,830     | 1,724   |    | 1,560    | 1,364   | 1,270     | 1,043    | 45% |
| Tuna, Southern Bluefin | 4,197     | 1,697   |    | 3,084    | 1,172   | 1,113     | 657      | 27% |
| Whiting, King George   | 1,834,492 | 251,739 | 1, | ,129,574 | 137,808 | 704,918   | 142,505  | 38% |
| Whiting, School        | 122,113   | 72,243  |    | 54,592   | 26,457  | 67,521    | 46,376   | 55% |
| Whiting, Unknown       | 36,837    | 16,074  |    | 21,410   | 10,265  | 15,427    | 7,046    | 42% |
| Whiting, Weedy         | 29,617    | 8,943   |    | 6,401    | 2,700   | 23,216    | 8,019    | 78% |
| Whiting, Yellowfin     | 200,090   | 91,629  | 1  | 139,359  | 69,915  | 60,731    | 23,408   | 30% |
| Wrasse, Bluethroat     | 5,339     | 2,320   |    | 2,001    | 1,167   | 3,338     | 1,726    | 63% |
| Wrasse, unknown        | 14,050    | 4,174   |    | 1,322    | 942     | 12,728    | 3,761    | 91% |
| Total (Marine Finfish) | 4,556,457 | NA      | 2, | ,707,245 | NA      | 1,849,213 | NA       | 41% |

SE is standard error; + indicates value <1000; values in bold indicate relative standard error (RSE) >40%, values in italics indicate <30 households recorded catches of the species/species group.

|                              | Total     |         | Retai     | ned     |           | Released |      |
|------------------------------|-----------|---------|-----------|---------|-----------|----------|------|
| Species                      | Ν         | SE      | N         | SE      | N         | SE       | %    |
| Abalone, Blacklip            | 3,296     | 2,836   | 3,296     | 2,836   | -         | -        | 0%   |
| Abalone, Greenlip            | 4,706     | 2,325   | 3,795     | 1,969   | +         |          | 19%  |
| Abalone, Unknown             | 2,204     | 2,168   | 1,692     | 1,662   | +         |          | 23%  |
| Calamari, Southern           | 573,808   | 71,712  | 550,179   | 69,332  | 23,629    | 5,500    | 4%   |
| Cockles, Mud                 | 117,777   | 69,924  | 93,484    | 60,377  | 24,293    | 22,595   | 21%  |
| Cockles, Unknown             | 157,246   | 146,405 | 157,246   | 146,405 | -         | -        | 0%   |
| Crab, Blue Swimmer           | 1,963,340 | 338,346 | 920,721   | 121,102 | 1,042,619 | 266,998  | 53%  |
| Crab, Other                  | 24,607    | 12,770  | 11,217    | 9,384   | 13,390    | 4,723    | 54%  |
| Crab, Sand                   | 19,003    | 5,771   | 6,687     | 2,421   | 12,316    | 4,654    | 65%  |
| Cuttlefish                   | 7,808     | 2,935   | 2,518     | 1,060   | 5,290     | 2,734    | 68%  |
| NonFish, Other               | 19,324    | 16,403  | 19,324    | 16,403  | -         | -        | 0%   |
| Octopus                      | 1,683     | 631     | +         |         | +         |          | 58%  |
| Pipi                         | 1,704,036 | 724,350 | 1,149,016 | 613,423 | 555,020   | 310,510  | 33%  |
| Razorfish                    | 95,162    | 52,661  | 95,162    | 52,661  | -         | -        | 0%   |
| Rock Lobster, Southern       | 126,136   | 36,706  | 80,950    | 21,306  | 45,187    | 17,314   | 36%  |
| Scallop                      | 20,244    | 11,137  | 17,085    | 8,719   | 3,159     | 2,846    | 16%  |
| Squid, Arrow                 | 2,765     | 1,435   | 2,765     | 1,435   | -         | -        | 0%   |
| Squid, Unknown               | 15,637    | 5,564   | 15,637    | 5,564   | -         | -        | 0%   |
| Total (Marine Invertebrates) | 4,859,448 | -       | 3,132,138 | -       | 1,727,310 | -        | 36%  |
| Bream, Bony                  | +         |         | -         |         | +         |          |      |
| Carp                         | 149,511   | 27,039  | 148,812   | 26,958  | 699       | 689      | 0%   |
| Catfish, Freshwater          | 2,715     | 1,095   | +         |         | 2,387     | 1,050    | 88%  |
| Cod, Murray                  | 2,435     | 927     | -         | -       | 2,435     | 927      | 100% |
| Perch, Golden                | 24,220    | 7,498   | 12,721    | 3,973   | 11,499    | 3,941    | 47%  |
| Perch, Redfin                | 42,833    | 18,100  | 41,313    | 17,873  | 1,521     | 1,050    | 4%   |
| Perch, Silver                | +         |         | +         |         | +         |          |      |
| Shrimp, Freshwater           | 281,608   | 126,640 | 194,108   | 91,431  | 87,500    | 40,410   | 31%  |
| Trout, Brown                 | +         |         | -         |         | +         |          |      |
| Trout, Rainbow               | 1,736     | 1,630   | +         |         | 1,582     | 1,624    | 91%  |
| Yabby, Freshwater            | 946,905   | 341,597 | 714,447   | 289,232 | 232,458   | 108,519  | 25%  |
| Total (Freshwater Species)   | 1.452.860 | -       | 1.111.950 | -       | 340,910   | _        | 23%  |

Table 3.4. Estimated annual catch (total, retained and released; by number) and proportion released/discarded for key marine invertebrates and freshwater species from March 2021 to February 2022.

SE is standard error; + indicates value <1000; values in bold indicate relative standard error (RSE) >40%, values in italics indicate <30 households recorded catches of the species/species group.



Figure 3.8. Relative importance (% release numbers) of different reasons for release of key species taken by SA residents aged five years or older who fished in SA from March 2021 to February 2022. Data are omitted for species with relative standard error (RSE) >40% for released number estimates.

### 3.4.3. Targeted fishing

This section reports on fishing effort for targeted species (up to two species could be nominated as targets) and whether the target species was caught. Non-targeted effort was often articulated by respondents as "fishing for a feed", "whatever takes the bait" or "nothing in particular". Note that zero catch events (equivalent to 21% of all events) were excluded from the analysis as they did not contribute to the targeted catch, only the targeted effort. Several species can be targeted using the same fishing method, in similar regions and water body. Targeted effort was grouped as per Appendix 16.

Targeted and non-targeted catch estimates for the key species are provided in Appendices 17 and 18 and the proportion of the catches that contributed to targeted effort is summarised in Table 3.5. Southern Rock Lobster, Blue Swimmer Crab, King George Whiting and Freshwater Yabbies were taken almost exclusively through targeted effort, implying a very high level of fishery specialisation for these species. Other species that tended to be caught primarily through targeted effort included Southern Calamari, Yelloweye Mullet, Golden Perch, Redfin Perch, Yellowfin Whiting and School Whiting, also implying a level of fishery specialisation for these species. By contrast, non-targeted effort accounted for more than half

of the Black Bream, Carp, Sand Crab, Silver Trevally, Australian Herring and Western Australian Salmon caught, indicating that these species tend to represent by-product (if retained) or by-catch (if released). Other key species with high release rates (≥50%) such as Snapper, Cuttlefish, Flathead, Leatherjacket, and Striped Perch were rarely if ever targeted. Blue Mackerel, Gummy Shark and Sweep had lower release rates (<50%) but were also rarely targeted implying low levels of fishery specialisation.

Table 3.5. Summary table indicating groupings based on the proportion of the recreational catch for key species that was taken by targeted effort from March 2021 to February 2022. Results only shown for species with data available from at least 20 households.

Non-target Target Proportion of catch targeted < 30% 31-50% 51-70% 71-90% >90% Cuttlefish Bream, Black Calamari, Southern Crab, Blue Swimmer Garfish, Southern Flathead Redfish, Bight Mullet, Yelloweye Rock Lobster, Southern Carp Crab, Sand Shrimp, Freshwater Perch, Golden Whiting, King George Leatherjacket Mackerel, Blue Herring, Australian Snook Perch, Redfin Yabby, Freshwater Perch, Striped Salmon, Western Australian Whiting, Yellowfin Shark, Gummy Trevally, Silver Whiting, School Snapper Sweep

#### 3.4.4. Harvest weights

During the 2021–22 survey period there were considerable estimates of recreational catch (by weight, > 50 tonnes) for a range of species including Blue Swimmer Crab, King George Whiting, Southern Calamari, Western Australian Salmon, Southern Rock Lobster, Razorfish, Carp and Freshwater Yabby (Table 3.6). Overall, the harvest of King George Whiting dominated the recreational catch (approximately 305 tonnes), followed by Blue Swimmer Crab (approximately 251 tonnes), and Southern Calamari (approximately 219 tonnes). Flathead recreational catch (approximately 9.3 tonnes) was about 10 times greater than the commercial catch. Conversely, the commercial catch of Leatherjackets, Sand Crab, and Southern Rock Lobster were more than 20 times higher than the recreational catch, and the commercial catches of Yelloweye Mullet and Flounder were more than 10 times higher than the recreational catch during the survey period.

Where stocks are delineated into management units, the relative proportions of recreational and commercial catch may differ to the State-wide catch. This was observed for Southern Garfish which had a 12% recreational catch share at the State-wide scale, while 80% of the total catch was harvested by recreational fishers in Southern Gulf St Vincent (Table 3.7). Conversely, the recreational catch of Southern Garfish was much lower than the commercial catch in Northern Spencer Gulf (3%) and Northern Gulf St Vincent (2%). For King George Whiting, the highest proportion of recreational catch was from Gulf St Vincent (73%), followed by Spencer Gulf (69%), both of which were higher than the State-wide recreational catch share (64%). Recreational catch shares for Snapper, Blue Swimmer Crab, and Southern Rock Lobster were generally similar to the State-wide catch proportions.

Southern Calamari, Australian Herring and Western Australian Salmon are not currently delineated into management units and the stocks are assessed at the State-wide scale (Drew *et al.* 2021). Nevertheless, however, there was sufficient data from the survey to provide some indication of commercial and recreational catch proportions at a regional level. For Southern Calamari, the recreational catch shares were similar between the regional and State-wide scales (43%). Recreational catch shares were highest for South-East and Far South-East (98%) and Gulf St Vincent and Kangaroo Island (53%), with lowest values for Northern Gulf St Vincent (34%) (Table 3.8). The catch proportions of Australian Herring varied regionally and differed considerably compared to the State-wide recreational catch share (26%). Recreational catch shares for Australian Herring were highest in Gulf St Vincent and Kangaroo Island (94%), the West Coast and Lower Eyre Peninsula (87%), and Southern Spencer Gulf (78%). Similarly, the catch of Western Australian Salmon varied regionally when compared to

the State-wide recreational catch share (21%). The highest recreational catch shares were observed on the West Coast and Lower Eyre Peninsula (97%), the South-East, Far South-East, and Coorong Lagoon (50%), and Gulf St Vincent (37%).

Table 3.6. Annual harvest (retained, by number), average weight (kg) and estimated harvest weight (t) for key species taken by recreational fishers in SA from March 2021 to February 2022, compared with commercial catch over the same period (logbook returns).

|                        |              | Recrea | tional    |        | Comm.    | Total     | %      |
|------------------------|--------------|--------|-----------|--------|----------|-----------|--------|
| Species                | Harvest      | Av. W. | Harv. (t) | SE     | catch    | catch (t) | Rec.   |
|                        | (No.)        | (kg)   |           |        | (t)      | ••••••(•) |        |
| Marine Finfish         | , <i>,</i> , |        |           |        |          |           |        |
| Bream, Black           | 7.505        | 0.74   | 5.55      | 3.37   | 2.91     | 8.46      | 66%    |
| Flathead spp.          | 26.620       | 0.35   | 9.27      | 5.91   | 0.86     | 10.13     | 92%    |
| Flounder               | 2.399        | 0.20   | 0.49      | 0.29   | 6.95     | 7.44      | 7%     |
| Garfish. Southern      | 264.506      | *      | 24.03     | 21.82  | 175.03   | 199.06    | 12%    |
| Herring, Australian    | 452.010      | *      | 39.68     | 37.23  | 112.07   | 151.75    | 26%    |
| Leatheriacket          | 33,705       | 0.18   | 6.17      | 4.34   | 208.01   | 214.18    | 3%     |
| Mackerel, Blue Slimv   | 25.575       | *      | 5.74      | 8.19   | 3.09     | 8.83      | 65%    |
| Morwona, Blue          | 1.197        | 1.09   | 1.30      | 0.58   | 0.67     | 1.97      | 66%    |
| Mullet, Red (goatfish) | 22.285       | 0.14   | 3.05      | 1.38   | 2.22     | 5.27      | 58%    |
| Mullet, Yelloweve      | 58.625       | 0.18   | 10.57     | 3.56   | 188.80   | 199.37    | 5%     |
| Mulloway               | 1.886        | *      | 23.97     | 14.77  | 54.80    | 78.77     | 30%    |
| Perch. Striped         | 122.745      | 0.09   | 10.92     | 6.84   | 10.61    | 21.53     | 51%    |
| Redfish, Bight         | 25.871       | 1.09   | 28.22     | 19.66  | 28.84    | 57.06     | 49%    |
| Salmon, W. Australian  | 154.614      | *      | 81.83     | 196.76 | 316.75   | 398.58    | 21%    |
| Shark. Gummy           | 2.567        | 3.10   | 7.95      | 7.95   | 47.04    | 54.99     | 14%    |
| Shark, School          | 1.232        | 7.42   | 9.14      | 5.16   | 20.53    | 29.67     | 31%    |
| Snapper                | 5.070        | *      | 8.37      | 16.25  | 25.07    | 33.44     | 25%    |
| Snook                  | 34.877       | 0.67   | 23.30     | 15.76  | 22.79    | 46.09     | 51%    |
| Sweep                  | 18.482       | *      | 6.48      | 12.56  | 0.40     | 6.88      | 94%    |
| Trevally, Silver       | 33.104       | 0.45   | 14.94     | 10.66  | 8.45     | 23.39     | 64%    |
| Tuna, Southern Bluefin | 3.084        | *      | 35.11     | 333.13 | NA       | NA        | NA     |
| Whiting, King George   | 1.129.574    | *      | 305.41    | 197.05 | 168.35   | 473.76    | 64%    |
| Whiting, School        | 54.592       | 0.09   | 4.77      | 2.92   | Conf.    | Conf.     | Conf.  |
| Whiting, Weedy         | 6.401        | 0.15   | 0.96      | 0.59   | 0.14     | 1.10      | 87%    |
| Whiting, Yellowfin     | 139.359      | 0.20   | 27.29     | 15.28  | 110.30   | 137.59    | 20%    |
| Wrasse                 | 1.322        | 0.63   | 0.83      | 0.84   | 7.23     | 8.06      | 10%    |
| Marine Invertebrates   | .,           | 0.00   |           |        |          | 0.00      |        |
| Abalone, Blacklip      | 3.296        | 0.39   | 1.30      | 1.12   | 338.54   | 339.84    | 0%     |
| Abalone, Greenlip      | 3.795        | 0.47   | 1.64      | 0.84   | 223.23   | 224.87    | 0%     |
| Calamari, Southern     | 550,179      | *      | 219.14    | 251.03 | 289.21   | 508.35    | 43%    |
| Cockle. Mud            | 93.484       | 0.02   | 2.04      | 1.51   | 62.47    | 64.51     | 3%     |
| Crab. Blue Swimmer     | 920.721      | *      | 250.61    | 142.53 | 610.70   | 861.31    | 29%    |
| Crab. Sand             | 6.687        | 0.35   | 2.36      | 0.86   | 61.30    | 63.67     | 4%     |
| Cuttlefish             | 2.518        | 0.32   | 0.80      | 0.34   | 1.85     | 2.65      | 30%    |
| Pipi                   | 1.149.016    | 0.02   | 18.38     | 10.65  | 381.08   | 399.46    | 5%     |
| Razorfish              | 95.162       | 1.00   | 95.16     | 52.66  | 20.60    | 115.76    | 82%    |
| Rock Lobster.          | 80,950       | *      | 72.43     | 44.66  | 1.677.52 | 1.749.95  | 4%     |
| Southern               | ,            |        |           |        | .,       | .,        |        |
| Scallop                | 17.085       | 0.03   | 0.485     | 0.27   | Conf.    | Conf.     | Conf.  |
| Freshwater             | ,            | 0.00   |           |        |          |           | 0.0111 |
| Carp                   | 148,812      | 0.67   | 99.03     | 104.76 | 431.61   | 530.64    | 19%    |
| Perch, Golden (Callop) | 12.721       | 0.88   | 11.21     | 4.69   | 45.05    | 56.26     | 20%    |
| Perch. Redfin          | 41,313       | 0.37   | 15.1      | 6,56   | 24.32    | 39.48     | 38%    |
| Yabby, Freshwater      | 714.447      | 0.08   | 59.30     | 24.01  | Conf.    | Conf.     | Conf.  |

Note- SE is standard error; \* indicates regional weight value used (available in Appendix 6); values in bold indicate relative standard error (RSE) >40%, values in italics indicate <30 households recorded for catches of the species/species group, NA indicates catch data was not available for the survey period, conf. indicates that the combined number of licence holders were less than five, and data is not shown due to confidentiality restrictions under the Fisheries Management Act 2007.

|                   |                          |                   |                         | Recreationa           | <u>1 </u>             |                         |                    |                    | Ree        |
|-------------------|--------------------------|-------------------|-------------------------|-----------------------|-----------------------|-------------------------|--------------------|--------------------|------------|
| Species           | Stock Assessment Unit    | Harvest<br>number | Harvest<br>number<br>SE | Avg<br>weight<br>(kg) | Harvest<br>Weight (t) | Harvest<br>Weight<br>SE | Comm.<br>catch (t) | Total<br>catch (t) | Harv.<br>% |
|                   | West Coast               | 18,529            | 10,140                  | 0.11                  | 1.96                  | 1.1                     | 2.71               | 4.67               | 42%        |
|                   | Northern Spencer Gulf    | 30,429            | 10,179                  | 0.07                  | 2.28                  | 0.8                     | 87.39              | 89.67              | 3%         |
| Carfieb Southern  | Southern Spencer Gulf    | 93,747            | 30,345                  | 0.09                  | 8.50                  | 2.8                     | 9.62               | 18.12              | 47%        |
| Garrisn, Southern | Northern Gulf St Vincent | 20,921            | 8,489                   | 0.08                  | 1.75                  | 0.7                     | 71.46              | 73.21              | 2%         |
|                   | Southern Gulf St Vincent | 75,984            | 33,837                  | 0.09                  | 7.19                  | 3.2                     | 1.76               | 8.95               | 80%        |
|                   | South-East               | 24,896            | 16,846                  | 0.09                  | 2.36                  | 1.9                     | 2.09               | 4.44               | 53%        |
| Snapper           | South-East               | 4,945             | 3,732                   | 2.20                  | 10.89                 | 16.1                    | 25.07              | 35.96              | 30%        |
| Whiting King      | West Coast               | 334,065           | 94,285                  | 0.23                  | 77.79                 | 22.0                    | 76.25              | 154.04             | 51%        |
| whiling, King     | Spencer Gulf             | 495,910           | 78,126                  | 0.29                  | 145.96                | 65.8                    | 64.2               | 210.16             | 69%        |
| George            | Gulf St Vincent          | 269,717           | 63,281                  | 0.27                  | 73.85                 | 34.5                    | 27.74              | 101.59             | 73%        |
| Crob Dlug         | Gulf St Vincent          | 449,114           | 94,285                  | 0.27                  | 123.46                | 34.00                   | conf.              | conf.              | conf.      |
| Crab, Diue        | Spencer Gulf             | 374,547           | 78,126                  | 0.27                  | 102.05                | 53.12                   | -                  | -                  | -          |
| Swimmer           | West Coast               | 58,460            | 63,281                  | 0.25                  | 14.44                 | 10.97                   | -                  | -                  | -          |
| Rock Lobster,     | Northern Zone            | 6,325             | 3,732                   | 1.01                  | 6.36                  | 3.51                    | 311                | 317.36             | 2%         |
| Southern          | Southern Zone            | 74,624            | 10,140                  | 0.89                  | 66.48                 | 41.37                   | 1,367              | 1,433.48           | 5%         |

Table 3.7. Annual harvest (retained, by number), average weight (kg) and estimated harvest weight (t) for key species taken by recreational fishers in SA from March 2021 to February 2022 by stock assessment unit , compared with commercial catch over the same period (logbook returns).

Note- SE is standard error; \* indicates regional weight value used (available in Appendix 6); values in bold indicate relative standard error (RSE) >40%, values in italics indicate <30 households recorded catches of the species/species group, NA indicates catch data was not available for the survey period, conf. indicates that the combined number of licence holders were less than five, and data is not shown due to confidentiality restrictions under the Fisheries Management Act 2007. Values replaced with "-" were omitted to avoid back calculation of confidential values.

|            |   |                   |                         | Recreation            |                       |                         |                    | Rec                |       |
|------------|---|-------------------|-------------------------|-----------------------|-----------------------|-------------------------|--------------------|--------------------|-------|
| Species    | Region  | Harvest<br>number | Harvest<br>number<br>SE | Avg<br>weight<br>(kg) | Harvest<br>Weight (t) | Harvest<br>Weight<br>SE | Comm.<br>catch (t) | Total<br>catch (t) | Harv. |
|            | West Coast and Lower Eyre Peninsula                           | 26,708            | 7,522                   | 0.38                  | 10.16                 | 7.16                    | 11.99              | 22.15              | 46%   |
|            | Southern Spencer Gulf   | 162,804           | 31,357                  | 0.38                  | 61.96                 | 32.63                   | 105.07             | 167.03             | 37%   |
| Calamari,  | Northern Spencer Gulf   | 124,673           | 33,890                  | 0.41                  | 51.24                 | 32.63                   | 57.85              | 109.09             | 47%   |
| Southern   | Northern Gulf St Vincent                                      | 82,715            | 22,808                  | 0.39                  | 32.01                 | 19.02                   | 63.13              | 95.14              | 34%   |
|            | Gulf St Vincent and Kangaroo Island                           | 139,213           | 40,577                  | 0.42                  | 57.91                 | 38.17                   | 51.02              | 108.93             | 53%   |
|            | South-East and Far South-East                                 | 14,066            | 3,965                   | 0.42                  | 5.85                  | 3.82                    | 0.15               | 6.00               | 98%   |
| Herring,   | West Coast and Lower Eyre Peninsula                           | 100,900           | 34,543                  | 0.10                  | 9.85                  | 5.37                    | 1.44               | 11.29              | 87%   |
| Australian | Southern Spencer Gulf   | 71,635            | 18,935                  | 0.08                  | 6.01                  | 1.59                    | 1.69               | 7.70               | 78%   |
|            | Northern Spencer Gulf   | 65,915            | 23,313                  | 0.08                  | 5.20                  | 3.11                    | 66.28              | 71.48              | 7%    |
|            | Northern Gulf St Vincent                                      | 47,274            | 15,972                  | 0.09                  | 4.42                  | 2.53                    | 41.71              | 46.13              | 10%   |
|            | Gulf St Vincent and Kangaroo Island                           | 149,072           | 42,103                  | 0.09                  | 12.72                 | 3.59                    | 0.76               | 13.48              | 94%   |
|            | Coorong, South-East, and Far South-East                       | 17,214            | 6,646                   | 0.09                  | 1.47                  | 0.84                    | conf.              | conf.              | conf. |
|            | West Coast and Lower Eyre Peninsula                           | 34,402            | 7,099                   | 0.73                  | 25.28                 | 35.24                   | 0.42               | 25.70              | 97%   |
|            | Southern Spencer Gulf   | 13,200            | 4,335                   | 0.99                  | 13.06                 | 9.80                    | 221.64             | 234.70             | 6%    |
| Salmon, W. | Northern Spencer Gulf   | 14,837            | 5,052                   | 0.25                  | 3.72                  | 2.38                    | 30.71              | 34.43              | 11%   |
| Australian | Northern Gulf St Vincent, Gulf St Vincent and Kangaroo Island | 67,782            | 26,962                  | 0.53                  | 35.78                 | 30.94                   | 60.07              | 95.87              | 37%   |
|            | Coorong, South-East, and Far South-East                       | 24.391            | 7.395                   | 0.16                  | 3,96                  | 2.20                    | 3.92               | 7.90               | 50%   |

Table 3.8. Annual harvest (retained, by number), average weight (kg) and estimated harvest weight (t) for key species taken by recreational fishers in SA from March 2021 to February 2022 by region, compared with commercial catches over the same period. Commercial catch data are based on logbook returns.

Note- SE is standard error; \* indicates regional weight value used (available in Appendix 6); values in bold indicate relative standard error (RSE) >40%, values in italics indicate <30 households recorded catches of the species/species group, NA indicates catch data was not available for the survey period, conf. indicates that the combined number of licence holders were less than five, and data is not shown due to confidentiality restrictions under the Fisheries Management Act 2007.

#### 3.4.5. Catch by water body

Of the estimated 10.9 million fish and invertebrates captured by recreational fishers in SA, 81% were taken from inshore waters, 12% from rivers, 4% offshore waters, 1% from estuaries, and 1% from lakes and dams. Catches from inshore waters primarily consisted of Blue Swimmer Crab, Pipi and King George Whiting (59%) (Fig 3.9A). Most of the offshore catch was King George Whiting (40%), with Bight Redfish, Blue Swimmer Crab, Southern Calamari, and Southern Garfish making large contributions (Fig 3.9B). Catches from estuaries were primarily composed of Blue Swimmer Crab (33%), Western Australian Salmon (31%) and Black Bream (16%) (Fig 3.9C). Freshwater Yabby and Freshwater Shrimp dominated catches in rivers and accounted for 66% and 21% of the catch, respectively (Fig 3.9D). Carp, and Golden Perch were of also large contributors to the catch in freshwater rivers, and Redfin Perch and Carp ranked highly in Lakes and Dams (Fig 3.9E).

Marine invertebrates including Blue Swimmer Crab, Sand Crab, Pipi, Southern Rock Lobster, Scallop, Abalone (all species), Southern Calamari and Mud Cockle were almost exclusively harvested inshore. Similarly, marine finfish species including Whiting (all species), Australian Herring, Southern Garfish, Snook, Sweep, Mullet (all species), Flounder, Mulloway and Bronze/Dusky Whaler Shark were almost exclusively harvested inshore. A high proportion of offshore catch was reported for species such as Yellowtail Kingfish, School Shark, Southern Bluefin Tuna, and Bight Redfish. Freshwater species such as Rainbow Trout, Brown Trout and Redfin Perch were nearly exclusively caught in lakes and dams. Murray Cod, Golden Perch, Carp, and Freshwater Yabby were mostly caught in rivers, while Freshwater Shrimp, Freshwater Catfish, Freshwater Yabby and Carp were almost exclusively caught in freshwater rivers. Catch details by water body are in Appendix 19.



Figure 3.9. Percentage composition of the recreational catch (numbers retained and released) by water body in SA from March 2021 to February 2022. A) inshore; B) offshore; C) estuaries; D) rivers; and E) lakes and dams. Note - colours denoting the species caught differ between panels. Catch details by water body are in Appendix 20.

### 3.4.6. Catch by method

Overall, line fishing accounted for 49% of the total catch and 99% of the total catch of marine finfish. King George Whiting represented 34% of the line catch, while Australian Herring, Southern Calamari, Other Whiting, Southern Garfish, Western Australian Salmon, Striped Perch, Carp, Toadfish/Pufferfish and Blue Swimmer Crab also made substantial contributions to the line-based catch (Fig. 3.10A). Crab nets accounted for 11% of the overall catch and 24% of the total marine invertebrate catch. The main species taken using crab nets was Blue Swimmer Crab (97% of crab net catch) (Fig. 3.10B). Cray pots accounted a low proportion of the overall marine invertebrate catch (1%), but frequently accounted for Southern Rock Lobster catch, accounting for 95% of the total (Fig. 3.10C).

Catches from gill/drag nets, dab/scoop nets and diving made up a low proportion of overall catch (<1%). Yelloweye Mullet comprised 100% of the gill/drag net catch, which is only allowed in the lower lakes (Fig. 3.10D). Blue Swimmer Crab (60%) and pipi (30%) made up most of the catch from dab/scoop net (Fig. 3.10E). Blue Swimmer Crab were also commonly caught by divers/spearfishers (including snorkelling) (62%), with Scallop also contributing to the catch (21%) (Fig. 3.10F). Hand collection accounted for 21% of the total catch and made up a large proportion of bivalves catch. Pipi was the main species taken by hand (71%), while Razorfish, Mud Cockle, unspecified cockle and Scallop also contributed to the catch (Fig. 3.10G). Yabby pots accounted for just over 10% of the total catch, with Freshwater Yabby (76%) and Freshwater Shrimp (24%) the most common species (Fig. 3.10H). Catch details by fishing method are provided in Appendix 15.



Figure 3.10. Percentage composition of the recreational catch (number retained and released) by fishing method in SA from March 2021 to February 2022 for A) line, B) crab net, C) cray pot, D) gill/drag net, E) dab/scoop net, F) diving/spear, G) hand collection, and H) yabby pot. Note - colours denoting the species caught differ between panels. Catch details by fishing method are in Appendix 21.

## 3.4.7. Line fishing

Line fishing was categorised by whether bait, lures/flies, or a combination of bait and lure/fly fishing was undertaken. At least 75% of the line catch was taken using bait for species including Sea Mullet, Yelloweye Mullet, Trevally, Flounder, School Whiting, Rays and Skates, Black Bream, Carp, and Golden Perch (Table 3.9). While bait was still the predominant method used for species such as Flathead, Southern Garfish, Australian Herring, Yellowtail Kingfish, Snapper, Sweep and King George Whiting, over a quarter of line catch was taken when using a combination of bait and lure/fly/jigs. For finfish species such as Southern Bluefin Tuna, and Redfin Perch, lure/fly/jig fishing was responsible for over half the catch. Similarly, cephalopods Southern Calamari, Cuttlefish, Arrow Squid, Squid (unknown spp.) were mostly caught using lure/fly/jig.

Table 3.9. Estimated catch (retained and released) by line fishing mode showing catch number and proportion taken using bait and/or lure/fly/jig for key species from March 2021 to February 2022.

| Species                |           | Number  |           | % of total |      |           |  |
|------------------------|-----------|---------|-----------|------------|------|-----------|--|
| •                      | Bait      | Both    | Lure/fly/ | Bait       | Both | Lure/fly/ |  |
|                        |           |         | jig       |            |      | jig       |  |
| Marine Finfish         |           |         |           |            |      |           |  |
| Barracouta             | +         | +       | +         | 59%        | 5%   | 37%       |  |
| Bream, Black           | 25,797    | +       | 4,126     | 86%        | 1%   | 13%       |  |
| Cod, Unknown           | 51,995    | 17,082  | +         | 74%        | 24%  | 1%        |  |
| Finfish, Unknown       | 1,742     | +       | 1,938     | 38%        | 21%  | 42%       |  |
| Flathead               | 37,431    | 6,961   | 8,310     | 71%        | 13%  | 16%       |  |
| Flounder               | 4,891     | +       | -         | 92%        | 8%   | 0%        |  |
| Garfish, Southern      | 187,292   | 114,754 | +         | 62%        | 38%  | 0%        |  |
| Herring, Australian    | 418,144   | 196,294 | 32,818    | 65%        | 30%  | 5%        |  |
| Kingfish, Yellowtail   | 3,033     | 1,063   | +         | 71%        | 25%  | 4%        |  |
| Leatherjacket          | 56,561    | 16,537  | 3,444     | 74%        | 22%  | 4%        |  |
| Luderick/Zebrafish     | 2,375     | -       | -         | 100%       | 0%   | 0%        |  |
| Mackerel, Blue Slimy   | 26,295    | 1,193   | 3,172     | 86%        | 4%   | 10%       |  |
| Morwong, Blue          | +         | +       | -         | 52%        | 48%  | 0%        |  |
| Mullet, Red            | 23,152    | 24,078  | +         | 48%        | 50%  | 1%        |  |
| Mullet, Sea            | 12,150    | +       | -         | 96%        | 4%   | 0%        |  |
| Mullet, Unknown        | 14,167    | 4,268   | +         | 76%        | 23%  | 1%        |  |
| Mullet, Yelloweye      | 61,272    | 2,036   | +         | 96%        | 3%   | 1%        |  |
| Mulloway               | 2,704     | +       | -         | 98%        | 2%   | 0%        |  |
| Perch, Striped         | 174,822   | 46,711  | 24,672    | 71%        | 19%  | 10%       |  |
| Rays and Skates        | 6,106     | +       | -         | 91%        | 9%   | 0%        |  |
| Redfish, Bight         | 22,361    | 15,712  | -         | 59%        | 41%  | 0%        |  |
| Salmon, W. Australian  | 183,779   | 33,017  | 62,616    | 66%        | 12%  | 22%       |  |
| Shark, Bronze Whaler   | +         | +       | +         | 66%        | 23%  | 11%       |  |
| Shark, Dogfish         | 3,631     | 1,007   | -         | 78%        | 22%  | 0%        |  |
| Shark, Gummy           | 2,755     | +       | +         | 74%        | 13%  | 14%       |  |
| Shark, Port Jackson    | 7,403     | 5,710   | 1,803     | 50%        | 38%  | 12%       |  |
| Shark, School          | 1,181     | +       | +         | 66%        | 23%  | 11%       |  |
| Snapper                | 31,066    | 22,499  | 5,379     | 53%        | 38%  | 9%        |  |
| Snook                  | 14,389    | 8,533   | 13,790    | 39%        | 23%  | 38%       |  |
| Sweep                  | 23,064    | 8,772   | +         | 71%        | 27%  | 2%        |  |
| Toadfish               | 57,811    | 31,675  | 4,292     | 62%        | 34%  | 5%        |  |
| Trevally, Silver       | 31,513    | 2,307   | 3,939     | 83%        | 6%   | 10%       |  |
| Trevally, Unknown      | 9,547     | 2,243   | -         | 81%        | 19%  | 0%        |  |
| Tuna, Southern Bluefin | +         | 1,504   | 2,183     | 12%        | 36%  | 52%       |  |
| Tuna, Unknown          | +         | +       | -         | 67%        | 33%  | 0%        |  |
| Whiting, King George   | 1,138,136 | 631,042 | 60,893    | 62%        | 34%  | 3%        |  |
| Whiting, School        | 107,316   | 14,797  | -         | 88%        | 12%  | 0%        |  |
| Whiting, Unknown       | 34,006    | 2,266   | +         | 92%        | 6%   | 2%        |  |
| Whiting, Weedy         | 17,122    | 11,056  | 1,440     | 58%        | 37%  | 5%        |  |
| Whiting, Yellowfin     | 146,085   | 18,750  | 35,255    | 73%        | 9%   | 18%       |  |
| Wrasse, Bluethroat     | 5,242     | +       | -         | 98%        | 2%   | 0%        |  |
| Wrasse, unknown        | 9,920     | 1,942   | 2,189     | 71%        | 14%  | 16%       |  |
| Marine Invertebrates   |           |         |           |            |      |           |  |
| Calamari, Southern     | 52,441    | 245,935 | 273,586   | 9%         | 43%  | 48%       |  |
| Crab, Blue Swimmer     | 18,479    | 11,490  | 1,822     | 58%        | 36%  | 6%        |  |
| Crab, Sand             | 3,759     | +       | -         | 97%        | 3%   | 0%        |  |
| Cuttlefish             | +         | 3,157   | 4,079     | 7%         | 40%  | 52%       |  |
| Squid, Arrow           | -         | +       | 2,107     | 0%         | 24%  | 76%       |  |
| Squid, Unknown         | 2,043     | 4,743   | 8,851     | 13%        | 30%  | 57%       |  |

Continued over page

| Species             | _       | Number | mber % of total |      |      | al        |
|---------------------|---------|--------|-----------------|------|------|-----------|
|                     | Bait    | Both   | Lure/fly/       | Bait | Both | Lure/fly/ |
|                     |         |        | jig             |      |      | jig       |
| Freshwater Finfish  |         |        |                 |      |      |           |
| Bream, Black        | 26,685  | +      | 4,126           | 86%  | 1%   | 13%       |
| Carp                | 125,123 | 16,471 | +               | 88%  | 12%  | 0%        |
| Catfish, Freshwater | 2,496   | -      | -               | 100% | 0%   | 0%        |
| Cod, Murray         | 1,867   | +      | +               | 77%  | 23%  | 1%        |
| Perch, Golden       | 20,252  | 2,274  | +               | 88%  | 10%  | 3%        |
| Perch, Redfin       | 5,931   | 10,247 | 26,312          | 14%  | 24%  | 62%       |
| Perch, Silver       | +       | -      | -               | 100% | 0%   | 0%        |
| Trout, Brown        | -       | -      | +               | 0%   | 0%   | 0%        |
| Trout, Rainbow      | -       | -      | 1,736           | 0%   | 0%   | 100%      |

#### Table 3.9. Continued.

Note- + indicates value <1000; values in bold indicate relative standard error (RSE) >40%, values in italics indicate <30 households recorded catches of the species/species group.

#### 3.4.8. Catch by platform

Overall, 71% of the total finfish catch was taken by boat-based fishers and 61% of the invertebrate catch was taken by shore-based fishers. The proportion of the catch taken by boat as opposed to shore-based fishing varied considerably between species (Appendices 21 and 22).

Bight Redfish, Southern Rock Lobster and Snapper were almost exclusively caught from boats (>99%) (Table 3.10). Other species that were primarily caught by boat-based fishers (>90%) included King George Whiting and Red Mullet. Boat-based effort also produced most of the catch (>75%) for species such as Snook, Toadfish/Pufferfish, Leatherjacket, Weedy Whiting, Southern Garfish, and Silver Trevally. In contrast, shore-based catches dominated for freshwater species such as Freshwater Shrimp, Carp, and Redfin Perch. Black Bream, Western Australian Salmon, and Yelloweye Mullet dominated marine shore-based catches. A range of species including Golden Perch, Freshwater Yabby, Southern Calamari, Flathead, Yellowfin Whiting, Trevally, Cuttlefish, Australian Herring, Blue Swimmer Crab and Sand Crab were mostly caught by boat-based fishers (>50%), but also had a large proportion of shore-based catch.

Boat

Table 3.10. Summary of the proportion of the recreational catch of key species taken by boat-based activities from March 2021 to February 2022. Results only shown for species with data available from at least 20 households.

Shore

|  | % Boat-based catch                                      |  |  |  |  |  |  |  |  |  |
|--|---|--|--|--|--|--|--|--|--|--|
| < 30%  | 31-50%  | 51-70%   | 71-90%   | >90%   |  |  |  |  |  |  |
| Shrimp, Freshwater<br>Salmon, Western Australian<br>Carp<br>Whiting, School<br>Mullet, Yelloweye<br>Bream, Black<br>Perch, Redfin<br>Mullet, Unknown | Cod, Unknown<br>Crab, Other<br>Sweep<br>Rays and Skates | Calamari, Southern<br>Shark, Gummy<br>Flathead<br>Whiting, Yellowfin<br>Perch, Golden<br>Trevally, Unknown<br>Cuttlefish<br>Shark, Port Jackson<br>Herring, Australia<br>Wrasse, Unknown<br>Crab, Blue Swimmer<br>Crab, Sand<br>Finfish, Unknown | Snook<br>Toadfish/Pufferfish<br>Leatherjacket<br>Whiting, Weedy<br>Trevally, Silver<br>Squid, Unknown<br>Perch, Striped<br>Garfish, Southern | Redfish, Bight<br>Lobster, Southern Rock<br>Snapper<br>Whiting, King George<br>Whiting, Unknown<br>Mullet, Red |  |  |  |  |  |  |

# 3.5. Key species

In the following section, the recreational catches for key Marine Finfish, Marine Invertebrate and Freshwater species are described (in order of total catch) by regional distribution (Appendix 14), total numbers retained and released (Table 3.3 and 3.4), catch by water body (Appendix 20), method (Appendix 21), and fishing platform (Appendix 22), and season. Catch information was provided by fishers during the 12-month diary survey and is presented as expanded estimates.

### 3.5.1. Marine Finfish

### King George Whiting

King George Whiting was the most caught finfish species in SA waters during the survey period and accounted for 41% (n = 1,834,492; SE = 251,739) of the total marine finfish catch by number (retained and released). A small amount of whiting catch was not identified to species (n = 36,837; SE = 16,074) and may have included some King George Whiting.

Most of the catch came from Gulf St Vincent (476K), Southern Spencer Gulf (460K), the West Coast (384K) and Northern Spencer Gulf (346K) (Fig 3.11A). The Lower Eyre Peninsula region and the South-East and Far South-East also contributed to the catch, with 130K and 37K fish caught, respectively. Approximately 38% of the catch was released (Fig 3.11B) with high release rates in Northern Spencer Gulf (50%) compared to Southern Spencer Gulf (29%), the West Coast (34%), Lower Eyre Peninsula (38%), and the South-East and Far South-East (20%). Catch was mostly taken from boat (96%) (Fig 3.11C), with line fishing (>99%) the predominant method (Fig 3.11D). Most catch was taken using bait (62%), with a smaller amount captured using both bait and/or lure (34%). King George Whiting catch was concentrated in inshore coastal waters (90% of total catch), with the remainder from offshore waters (10%) (Fig 3.11E). Catch peaked during March–April (541K or 29% of the total catch) and September–October (399K or 22% of the total catch) (Fig 3.11F).



Figure 3.11. Characteristics of the recreational fishery for King George Whiting in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) region; B) retained or released; C) boat or shore based; D) fishing method; E) water body; and F) season. Error bars show standard error, \* indicates relative standard error (RSE) >40%.

#### Australian Herring

Australian Herring was the second most caught marine finfish species in SA waters during the survey period and accounted for 14% (n = 648,190; SE = 94,724) of the total marine finfish catch by number (retained and released). Australian Herring was mostly caught in Gulf St Vincent (269K), the West Coast and Lower Eyre Peninsula (158K), and Southern Spencer Gulf (102K) (Fig 3.12A). Most Australian Herring catch was retained, with only 30% released (Fig 3.12B), most was captured by boat-based fishers (55%) (Fig 3.12C) using lines (>99%,Fig 3.12D) with bait (65%). Catch was concentrated in inshore coastal waters (97% of total catch) (Fig 3.12E). Catch peaked in March–April (233K or 36% of catch) and declined substantially in May–June. Catch then steadily increased, reaching a secondary peak of 155K (or 24% of catch) during January–February (Fig 3.12F).

### Southern Garfish

Southern Garfish was the third most caught marine finfish species in SA waters during the survey period and accounted for 7% (n = 328,208; SE = 63,210) of the total marine finfish catch by number (retained and released). Most of the catch came from Gulf St Vincent (136K) and Southern Spencer Gulf (105K) (Fig 3.13A). Most Southern Garfish catch was retained with only 19% released (Fig 3.13B), and most was taken from boats (71%) (Fig 3.13C), primarily from line-based fishing (92%) (Fig 3.13D). Catch was mostly using bait (62%) or with both bait and/or lure/jig (38%) and was concentrated in inshore coastal waters (93% of total catch) (Fig 3.13E). Catch was highly seasonal with a peak during March–April (107K or 32% of the total catch), and a larger peak in January-February (118K or 36% of the total catch) (Fig 3.13F).



Figure 3.12. Characteristics of the recreational fishery for Australian Herring in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) region; B) retained or released; C) boat or shore based; D) fishing method; E) water body; and F) season. Error bars show standard error, \* indicates relative standard error (RSE) >40%.



Figure 3.13. Characteristics of the recreational fishery for Southern Garfish in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) region; B) retained or released; C) boat or shore based; D) fishing method; E) water body; and F) season. Error bars show standard error, \* indicates relative standard error (RSE) >40%.

#### Western Australian Salmon

Western Australian Salmon was the fourth most caught marine finfish species in SA waters during the survey period and accounted for 6% (n = 280,069; SE = 46,191) of the total marine finfish catch by number (retained and released). The highest catch of Western Australian Salmon came from Gulf St Vincent (110K), followed by the South-East, Far South-East and Coorong Lagoon (52K), the West Coast (45K), the West Coast (45K), Northern Spencer Gulf (24K), and Southern Spencer Gulf (22K) (Fig 3.14A). Approximately 45% of the catch was released (Fig 3.14B), and most of the catch was taken from shore-based fishing (79%) (Fig 3.14C), using lines (99.8%, Fig 3.14D) with bait (66%). Western Australian Salmon catch was concentrated in inshore coastal waters (82% of total catch), with the remainder taken from estuaries (16%) or offshore (2%, Fig 3.14E). Most of the Western Australian Salmon catch was reported between March and June (61% or 170K), with lower catches (<25K per month) from July to February (Fig 3.14F).

#### **Leatherjacket**

The total catch (retained and released) of Leatherjackets during the survey period was estimated at 80,655 (SE = 13,935). Leatherjacket catch was reported in most regions of the State, with the highest catches coming from Spencer Gulf (30K), Gulf St Vincent /Kangaroo Island (26K), and Northern Gulf St Vincent (16K, Fig 3.15A). The majority of Leatherjacket catch was released (58%) (Fig 3.16B), most of the catch was taken by boat-based fishers (81%, Fig 3.15C), and almost exclusively by line fishing (95%, Fig 3.15D), using bait (74%). Leatherjacket catch was primarily taken in inshore coastal waters (88% of total catch, Fig 3.15E). Catch was taken year-round with a peak in March–April (29K or 36%, Fig 3.15F).



Figure 3.14. Characteristics of the recreational fishery for Western Australian Salmon in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) region; B) retained or released; C) boat or shore based; D) fishing method; E) water body; and F) season. Error bars show standard error, \* indicates relative standard error (RSE) >40%.


Figure 3.15. Characteristics of the recreational fishery for Leatherjacket in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) region; B) retained or released; C) boat or shore based; D) fishing method; E) water body; and F) season. Error bars show standard error, \* indicates relative standard error (RSE) >40%. Note- pictured is the Ocean Leatherjacket, one of 19 species of Leatherjackets that occur in South Australia.

#### Yelloweye Mullet

The estimated total catch (retained and released) of Yelloweye Mullet during the survey period was 69,657 (SE = 21,612). Catches of Yelloweye Mullet were reported for all regions, with the highest catches coming from Gulf St Vincent and Kangaroo Island. Overall, 16% of the catch was released (Fig. 3.16A). Catch was taken from marine waters and mostly by shore-based fishers (inshore waters, 91% of catch) (Fig. 3.16B and D). Most of the catch was taken by line-fishing (92%) using bait (Fig. 3.16C).

#### <u>Snapper</u>

Overall, an estimated 59,129 (SE = 13,038) Snapper were captured (retained and released) during the survey period throughout SA. Most (91%) of the State-wide catch was released (Fig. 3.17B) which reflected the management arrangements at the time of the survey. Accordingly, the release rate was considerably lower in the Far South-East (34%), where a limited amount of Snapper fishing was permitted. The majority of Snapper were captured in Spencer Gulf, with 17K captured in NSG and 21K in SSG (Fig 3.17A). Catch was almost exclusively taken from boat-based line fishing (99%), with most Snapper captured using bait (53%) or a combination of bait and/or lure/jig (38%, Fig. 3.17C and D). Catch was concentrated in inshore coastal waters (88% of total catch, Fig. 3.17E), with most taken during March and April (24K or 40% of the total catch, Fig 3.17F).

## Flathead

The total catch (retained and released) of Flathead (multiple species) throughout the survey period was estimated at 53,868 (SE = 12,852). Catch ranged from ~2K in Southern Spencer Gulf to 6–8K in each of the Northern Spencer Gulf, Lower Eyre Peninsula, and the West Coast (Fig 3.18A). About half of all Flathead captured were released (Fig 3.18B) and most were taken by boat-based fishers (67%) (Fig 3.18C). Catch was almost exclusively taken by line fishing (98%) (Fig 3.18D), with most fish capture using bait (71%), although lure fishing or a combination of lure/bait was also common. Flathead catch was concentrated in inshore coastal waters (81% of total catch, Fig 3.18E) and was reported year-round with a peak in March to April (38%).



Figure 3.16. Characteristics of the State-wide recreational fishery for Yelloweye Mullet in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) region; B) retained or released; C) boat or shore based; D) fishing method; and E) water body. Error bars show standard error, \* indicates relative standard error (RSE) >40%.



Figure 3.17. Characteristics of the recreational fishery for Snapper in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) region; B) retained or released; C) boat or shore based; D) fishing method; E) water body; and F) season. Error bars show standard error, \* indicates relative standard error (RSE) >40%.



Figure 3.18. Characteristics of the recreational fishery for Flathead (multiple species) in South Australia from March 2021 to February 2022: Plots show the total catch (number) by: A) region; B) retained or released; C) boat or shore based; D) fishing method; and E) water body, and F) season. Error bars show one standard error. Error bars show standard error, \* indicates relative standard error (RSE) >40%.

#### **Bight Redfish**

The estimated total catch (retained and released) of Bight Redfish (including Nannygai, Red Snapper, and Swallowtail) during the survey period was 38,073 (SE = 11,431). Catch was reported across all marine regions of SA. Approximately 32% of the catch was released (Fig 3.19A). Catch was exclusively taken by boat-based fishers (Fig. 3.19B) from marine waters and mostly offshore (83% of the catch, Fig. 3.19C). Catch was exclusively from line-fishing, mostly using bait (59% of the catch) or a combination of bait and lures (41% of the catch, Fig. 3.19D).



Figure 3.19. Characteristics of the State-wide recreational fishery for Bight Redfish in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) region; B) retained or released; C) boat or shore based; and D) fishing method. Error bars show one standard error. Error bars show standard error, \* indicates relative standard error (RSE) >40%.

#### Silver Trevally

Overall, an estimated 37,760 (SE = 14,635) Silver Trevally were caught (retained and released) from March 2021 to February 2022. An additional 11,790 (SE = 3,483) Trevally was not identified to species and may have included some Silver Trevally. Catch was reported across all marine regions of SA. The majority (88%) of the catch was retained, with only 12% of the catch released (Fig 3.20A). Catch was taken from marine waters and mostly by boatbased fishers (77% of the catch) (Fig. 3.20B), using lines with bait (83% of the catch) (Fig. 3.20). Catches were taken from both inshore (57% of the catch) and offshore waters (43% of the catch) (Fig. 3.20D).



Figure 3.20. Characteristics of the State-wide recreational fishery for Silver Trevally in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) region; B) retained or released; C) boat or shore based; D) fishing method; and E) water body. Error bars show standard error, \* indicates relative standard error (RSE) >40%.

## <u>Snook</u>

The estimated total catch (retained and released) of Snook during the survey period was 38,806 (SE = 11,459). The highest catches were from Gulf St. Vincent (Fig 3.21A). The majority of Snook captured were retained, with only 5% of the catch released (Fig 3.21B). Snook were primarily captured by boat-based fishers (83% of the catch), from line-fishing using bait (39% of the catch) or lures (38% of the catch, Fig. 3.21D). Most of the catch was taken inshore (92%), with the remainder captured offshore (7%) or in estuaries (1%, Fig. 3.21E).

## Sweep

An estimated total of 32,681 (SE = 9,849) Sweep were caught (retained and released) from March 2021 to February 2022. Catches were reported across all marine regions (Fig 3.22A). Approximately 43% of the catch was released (Fig 3.22B) which was taken from marine waters by shore-based fishers (61% of the catch, Fig. 3.22C). Catch was almost exclusively from line-fishing (99%), with bait commonly used (71%) (Fig. 3.22D). Most of the catch was from inshore waters (91% of the catch, Fig. 3.22E).

## Black Bream

The recreational catch (retained and released) of Black Bream was estimated at 30,878 (SE = 7,853) during the survey period. The highest catch was from Gulf St. Vincent (21K), and most was released (76%) (Fig 3.23B). The majority of Black Bream were captured by shore-based fishers (96%) (Fig 3.23C) using rod and line (98%, Fig 3.23D). Most of the catch was taken from estuarine waters (72%, Fig 3.23E).



Figure 3.21. Characteristics of the recreational fishery for Snook in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) region; B) retained or released; C) boat or shore based; D) fishing method; and E) water body. Error bars show standard error, \* indicates relative standard error (RSE) >40%.



Figure 3.22. Characteristics of the State-wide recreational fishery for Sweep in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) region; B) retained or released; C) boat or shore based; D) fishing method; and E) water body. Error bars show standard error, \* indicates relative standard error (RSE) >40%.



Figure 3.23. Characteristics of the recreational fishery for Black Bream in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) region; B) retained or released; C) boat or shore based; D) fishing method; and E) water body. Error bars show standard error, \* indicates relative standard error (RSE) >40%.

#### Southern Bluefin Tuna

The estimated total number (retained and released) of Southern Bluefin Tuna captured during the survey period was 4,197 (SE = 1,697). Catch was reported across all marine regions except for Spencer Gulf and Northern Gulf St Vincent. Over 70% of catch was retained, (Fig 3.24A), all taken by boat-based fishers (Fig. 3.24B), primarily from offshore waters (78% of the catch, Fig. 3.24D). Catch was exclusively from line-fishing (Fig. 3.24C), with most captured using lures (52% of the catch).



Figure 3.24. Characteristics of the recreational fishery for Southern Bluefin Tuna in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) region; B) retained or released; C) boat or shore based; D) fishing method; and E) water body. Error bars show standard error, \* indicates relative standard error (RSE) >40%.

#### Gummy Shark

The estimated total catch (retained and released) of Gummy Shark from March 2021 to February 2022 was 3,926 (SE = 1,177). Catch was reported from most regions, with approximately 35% of the catch released (Fig 3.25A). Gummy Shark was primarily captured by boat-based fishers (68% of the catch) (Fig. 3.25B). Catch was exclusively from line-fishing in inshore waters (80%, Fig. 3.25D), primarily using bait (74% of the catch).



Figure 3.25. Characteristics of the State-wide recreational fishery for Gummy Shark in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) region; B) retained or released; C) boat or shore based; D) fishing method; and E) water body. Error bars show standard error, \* indicates relative standard error (RSE) >40%.

#### <u>Mulloway</u>

The estimated State-wide catch (retained and released) of Mulloway during the survey period was 3,720 (SE = 1,243) individuals. Catches of Mulloway were reported from the West Coast, Northern Gulf St Vincent, Gulf St Vincent and Kangaroo Island, the South-East, Far South-East and Coorong Lagoon. Approximately half of the catch was released, although the precision around this estimate was poor (Fig. 3.26A). Mulloway were mostly caught by shore-based fishers (89%) in inshore waters (Fig. 3.26B), using rod and line (Fig. 3.26A) and bait.



Figure 3.26. Characteristics of the recreational fishery for Mulloway in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) region; B) retained or released; C) boat or shore based; D) fishing method; and E) water body. Error bars show standard error, \* indicates relative standard error (RSE) >40%.

### 3.5.2. Marine Invertebrate

### Blue Swimmer Crab

Blue Swimmer Crabs were the most caught of all species in SA waters during the survey period, representing 18% (n = 1,963,340; SE = 338,346) of the total catch by number (retained and released). A small amount of crab catch was not identified to species (n = 24,607; SE = 12,770) and may have included some Blue Swimmer Crab. Most of the catch was from Northern Gulf St Vincent (996K) and Northern Spencer Gulf (556K) (Fig. 3.27A), followed by Gulf St Vincent/Kangaroo Island (209K), and Southern Spencer Gulf (117K). Just over half (53%) of the catch was released (Fig. 3.27B), and there were differences in release rates between regions. Catch was evenly split across boat-based (52%) and shore-based (46%) fishing (Fig. 3.27C). However, a higher proportion of boat-based catch was retained (67%) compared to shore-based catch (33%). Most of the catch was taken using crab nets (74%), with a small proportion captured by hand collection (including rakes, Fig. 3.27D). Catch was almost exclusively from inshore waters (96%, Fig. 3.27E). Catch was highly seasonal with high catches in March and April (45% of the total catch) and again from November to February, with low catches between May and October (Fig. 3.27F).



Figure 3.27. Characteristics of the recreational fishery for Blue Swimmer Crab in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) region; B) retained or released; C) boat or shore based; D) fishing method; E) water body; and F) season. Error bars show standard error, \* indicates relative standard error (RSE) >40%.

## Southern Calamari

During the survey period, Southern Calamari were the sixth most caught of all species in SA waters, representing 5% (n = 573,808; SE = 71,712) of the total catch by number (retained and released). A small amount of Squid catch was not identified to species (n = 15,637; SE = 5,564) and may have included some catch of Southern Calamari. Most of the catch was from Southern Spencer Gulf (166K), followed by Gulf St Vincent/Kangaroo Island (144K), Northern Spencer Gulf (131K) and Northern Gulf St Vincent (90K, Fig. 3.28A). Most of the catch was retained with only 4% released (Fig. 3.28B), and most was from boat-based fishing (69%, Fig. 3.28C) using lines (>99%, Fig. 3.28D). Catch was mostly split across lures/jigs (48%) and both bait and/or lure/jig (43%). Catch was concentrated in inshore coastal waters (96% of total catch, Fig. 3.28E), and was reported year-round, with a peak during March and April (154K or 27% of total, Fig. 3.28F).

## Southern Rock Lobster

During the survey period, the estimated catch (retained and released) of Southern Rock Lobster was 126,136 individuals (SE = 36,706), most of which was captured in the Far South-East (119K, Fig 3.29A). Most of the catch was retained with only 36% released (Fig 3.29B), and catch was almost exclusively taken by boat-based fishers (99%, Fig 3.29C) using cray pots (93%, Fig 3.29D). Catch was concentrated in inshore coastal waters (93% of total catch, Fig 3.29E) and was highest from November to February (92K or 73% of the total catch, Fig 3.29F).

## Sand Crab

An estimated 19,003 (SE = 5,771) Sand Crab were caught (retained and released) during the survey period, with largest catches coming from Gulf St Vincent (10K, Fig. 3.30A). Overall, 65% of the catch was released (Fig. 3.30B), with half of the catch taken from boat-based fishing (52%, Fig. 3.30C). Sand Crab were mostly taken by crab nets (70%, Fig. 3.30D) in inshore waters (Fig. 3.30E).



Figure 3.28. Characteristics of the recreational fishery for Southern Calamari in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) region; B) retained or released; C) boat or shore based; D) fishing method; E) water body; and F) season. Error bars show one standard error.



Figure 3.29. Characteristics of the recreational fishery for Southern Rock Lobster in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) region; B) retained or released; C) boat or shore based; D) fishing method; E) water body; and F) season. Error bars show standard error, \* indicates relative standard error (RSE) >40%.





Figure 3.30. Characteristics of the recreational fishery for Sand Crab in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) region; B) retained or released; C) boat or shore based; D) fishing method; and E) water body. Error bars show standard error, \* indicates relative standard error (RSE) >40%.

### 3.5.3. Freshwater

### Freshwater Yabby

During the survey period, an estimated total of 946,905 (SE = 341,597) Freshwater Yabby were caught (retained and released). Freshwater Yabby were primarily caught by boat-based fishers (59% of the catch) (Fig. 3.31A) and most of the catch was retained (75%) (Fig 3.31B). Catch was mainly taken from yabby pots (95%, Fig. 3.31C), and most catch was from rivers (94% of the catch) (Fig. 3.31D).



Figure 3.31. Characteristics of the State-wide recreational fishery for Yabby in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) retained and released; B) boat or shore-based; C) fishing method; and D) water body. Error bars show standard error, \* indicates relative standard error (RSE) >40%.

#### <u>Carp</u>

An estimated 149,511 (SE = 27,039) Carp were caught (retained and released) during the survey period, with the majority (130K) captured from the River Murray. Carp were primarily captured by shore-based fishers (79% of the catch, Fig 3.32B) and almost all catch was not returned to the water (>99%, Fig. 3.32C). Catch was almost exclusively captured from line fishing (99%, Fig. 3.32D) and mostly from rivers (89%) (Fig. 3.32E).

### Golden Perch

An estimated total of 24,220 (SE = 7,498) Golden Perch (Callop) were caught (retained and released) during the survey period, with most of the catch reported from the River Murray (21K) (Fig 3.33A). Golden Perch catch was split between released (47%) and retained (53%, Fig 3.33B), with catch taken by boat- and shore-based fishers (Fig. 3.33C). Catch was exclusively from line-fishing (Fig. 3.33D), mostly using bait (88%), and most of the catch was from rivers (80% of the catch) (Fig. 3.33E).

Α



Figure 3.32. Characteristics of the State-wide recreational fishery for Carp in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) region; B) retained or released; C) boat or shore based; D) fishing method; and E) water body. Error bars show standard error, \* indicates relative standard error (RSE) >40%.



Figure 3.33. Characteristics of the State-wide recreational fishery for Golden Perch in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) region; B) retained or released; C) boat or shore based; D) fishing method; and E) water body. Error bars show standard error, \* indicates relative standard error (RSE) >40%.

### Murray Cod

An estimated catch of 2,435 (SE= 927) Murray Cod were caught throughout the survey period, with catches reported from all freshwater regions of SA. All catch was released (Fig 3.34A) and was primarily caught by boat-based fishers (62% of the catch, Fig. 3.34B). Catch was exclusively from line-fishing (Fig. 3.34C), mostly using bait (77%) or a combination of bait and lures (23%). Most of the catch was from rivers (74% of the catch), with a smaller component from Lakes and Dams (26% of the catch, Fig. 3.34D).



Figure 3.34. Characteristics of the State-wide recreational fishery for Murray Cod in South Australia from March 2021 to February 2022. Plots show the total catch (number) by: A) retained and released; B) boat or shore-based; C) fishing method; and D) water body. Error bars show standard error, \* indicates relative standard error (RSE) >40%.

## 3.5.4. Regional fisheries

In this section, fishing region is considered in the context of residential location to provide an understanding of the level of local vs. 'imported' fishing effort, the relative importance of the fishing methods used, and catch composition. Catch and effort information was provided by fishers during the 12-month diary survey and is presented as expanded estimates.

All references to fishing regions relate to those identified in Fig. 2.3, while area of residence relates to the ABS statistical areas (Level SA4) in which fishers reside (Fig. 2.2). Detailed information on catch and effort by region is provided in Appendix 14. Data for Inland and rest of SA, the Lower Lakes, Coorong Lagoon and River Murray are not presented due to a low number of households reporting catch and high RSE.

## 3.5.5. Gulf St Vincent

Gulf St Vincent was split into two regions for reporting purposes: Northern Gulf St Vincent (NGSV), and Gulf St Vincent and Kangaroo Island (GSVKI, Fig. 3.35A). For both regions, fishers from adjoining areas accounted for the highest proportion of effort. Residents from Adelaide-North were the main contributors to fishing effort (40%) in NGSV, whilst residents from Adelaide-South (35%) accounted for the most effort in GSVKI (Fig. 3.35B). The number of residents from Adelaide-North who fished in NGSV (20,437) was at least double of those who travelled from any other region. However, those who travelled from Adelaide-South accounted for a large proportion of effort (fisher-days) in NGSV (35%). A large proportion of effort in NGSV was also derived from residents of Adelaide-Central/hills (15%) and Barossa-Yorke-Mid North (6%). Residents from Adelaide-Central/hills travelled to both NGSV (19%) and GSVKI (17%).

Line fishing accounted for the highest proportion of catch in NGSV (60%) and GSVKI (85%), followed by crab nets (NGSV; 25%, GSVKI; 10%) (Fig. 3.35C). Most of the effort was from shore fishing in both regions, 69% in GSVKI and 64% in NGSV (Fig. 3.35D). Blue Swimmer Crab clearly dominated the catches in NGSV and accounted for 55% of the regional catch, followed by King George Whiting (15%) (Fig. 3.35F). King George Whiting was the most caught species in GSVKI (17%) followed closely by Blue Swimmer Crab (17%) (Fig. 3.35E). The remainder of the catch in both regions was primarily composed of Australian Herring, Southern Calamari, Southern Garfish, and Western Australian Salmon.



Figure 3.35. Characteristics of the Gulf St Vincent (GSV) recreational fishery from March 2021 to February 2022. A) map of SA showing the statistical area level (1 Adelaide– Central and Hills, 2 Adelaide–North, 3 Adelaide–South, 4 Adelaide–West, 5 Barossa-Yorke-Mid North, 6 South Australia– Outback, and 7 South Australia–South East); B) fishing effort (fisher days) based on the region of residence (statistical area) of fishers; C) effort (fisher days) by method; D) effort (fisher days) by platform; and catch (number) for key species in E) Gulf St Vincent/Kangaroo Island and F) Northern Gulf St Vincent. Error bars show standard error, \* indicates relative standard error (RSE) >40%.

## 3.5.6. Spencer Gulf

Spencer Gulf was split into two regions for reporting purposes: Northern Spencer Gulf (NSG) and Southern Spencer Gulf (SSG, Fig. 3.36A). For both regions, a large proportion of the effort was derived from the adjoining areas. In NSG, residents from SA-Outback were the main contributors to fishing effort (42%, Fig. 3.36B). Residents from Barossa-York-Mid North were the main contributors to fishing effort (24%) in SSG and contributed a large proportion of effort in NSG (18%). Residents from Adelaide-North and Adelaide-South also made a major contribution to effort in both regions (15–16% in NSG and 12–19% in SSG). Residents from Adelaide Central/Hills contributed a similar amount of effort in SSG (13%) but had a lower contribution to effort in NSG (4%). A similar trend was observed for residents of the South-East and Adelaide-West.

Line fishing was the dominant method in NSG (74%) and SSG (89%), followed by crab nets (NSG; 23%, SSG; 9%, Fig. 3.36C). Boat-based effort represented 58% of the total effort in NSG and 51% of the total effort in SSG (Fig. 3.36D). King George Whiting was the most caught species in Spencer Gulf, making up 28% of the catch SSG and 21% in NSG (Fig. 3.36E and F). Blue Swimmer Crab made up most of the catch in NSG (34%) and ranked highly in SSG (7%) (Fig. 3.36E and F). The remainder of the catch in both regions was mostly composed of Southern Calamari, Australian Herring, Southern Garfish, and Striped Perch. Yellowfin Whiting, School Whiting and Toadfish/Pufferfish made up a large proportion of the catch in NSG, but catches were comparatively low in SSG.



Figure 3.36. Characteristics of the Spencer Gulf (SG) recreational fishery from March 2021 to February 2022. A) map of region indicating the statistical area level (1 Adelaide– Central and Hills, 2 Adelaide– North, 3 Adelaide–South, 4 Adelaide–West, 5 Barossa-Yorke-Mid North, 6 South Australia–Outback, and 7 South Australia–South East); B) fishing effort (fisher days) based on the region of residence (statistical area) of fishers; C) effort (fisher days) by method; D) effort (fisher days) by platform; and catch (numbers) for the key species in E) NSG and F) SSG. Error bars show standard error, \* indicates relative standard error (RSE) >40%.

## 3.5.7. West Coast and Lower Eyre Peninsula

The West Coast and Lower Eyre Peninsula covers the entire West Coast of the Eyre Peninsula to the Western Australian border (Fig 3.37A). For both regions, a large proportion of the effort was derived from the adjoining areas. In the Lower Eyre Peninsula and the West Coast, residents from SA-Outback contributed the highest proportion of effort at 50% and 33%, respectively (Fig 3.37B). Residents from Adelaide-South also made large contributions to effort on the West Coast (26%) and the Lower Eyre Peninsula (17%). Residents from Adelaide-North travelled to the West Coast and accounted for 18% of the effort in that region, but only contributed 2% of effort for the Lower Eyre Peninsula. Despite their proximity to the South-West Coast, residents from Barossa-Yorke-Mid North made a relatively low contribution to effort on the West Coast (9%) and Lower Eyre Peninsula (7%). Line fishing was the dominant method in each region (82%) (Fig 3.37C), followed by hand collection (Lower Eyre Peninsula; 1%, West Coast; 7%) and crab nets (Lower Eyre Peninsula; 2%, West Coast; 7%). Fishing from boats dominated the effort in the Lower Eyre Peninsula (68%), while boat and shore fishing had equal contributions to effort in West Coast (Fig. 3.37D).

King George Whiting were the most caught species on the West Coast (40%) and Lower Eyre Peninsula (46%) (Fig 3.37E and F), followed by Australian Herring (West Coast; 13%, Lower Eyre Peninsula; 12%). The remainder of the catch on the West Coast was mostly composed of Razorfish, Pipi, Blue Swimmer Crab, Western Australian Salmon, Striped Perch, and Southern Calamari. Whiting (unknown sp.). Mud Cockles and Bight redfish also contributed a large amount to the overall catch in the Lower Eyre Peninsula region.



Figure 3.37. Characteristics of the South-West Coast recreational fishery from March 2021 to February 2022. A) map of region indicating the statistical area level (1 Adelaide– Central and Hills, 2 Adelaide– North, 3 Adelaide–South, 4 Adelaide–West, 5 Barossa-Yorke-Mid North, 6 South Australia–Outback, and 7 South Australia–South East), B) fishing effort (fisher days) based on the region of residence (statistical area) of fishers; C) effort (fisher days) by method; D) effort (fisher days) by platform; and catch (numbers) for the key species in E) Lower Eyre Peninsula and F) West Coast. Error bars show standard error, \* indicates relative standard error (RSE) >40%.

### 3.5.8. South-East and Far South-East

The South-East Coast was divided into two regions for reporting purposes, the South-East and the Far South-East (Fig. 3.38A). The South-East encompasses the waters from Cape Jervis to the Coorong (about 10km east of the Murray Mouth), and the southern coastline of Kangaroo Island. The Far South-east covers the remaining coastline from the Murray Mouth to the Victorian Border. Local residents dominated effort in the South-East region (34%), although residents travelling from Adelaide-South and Central/Hills also made substantial contributions (22% and 27%, respectively, Fig. 3.38B). Shore-based fishing accounted for the highest proportion of effort (79%), with line fishing (72%) and hand collection (21%) the most common fishing methods (Fig. 3.38C). Pipi accounted for the majority of the catch (by number) in the South-East (82%) and was highly ranked in the Far South-East (11%, Fig. 3.38F). Cockles (unknown species) also ranked highly in the South-East (8%).

In the Far South-East, effort from local residents was more than 10-times higher than any other residential area, contributing 84% of the total effort (Fig. 3.38B). Most of the effort was from boat fishing (77%), with cray pots the dominant method (56%) followed by line fishing (39%). Southern Rock Lobster was the most caught species in the Far South-East (34%) (Fig. 3.38E). The remaining catch from the Far South-East was mostly King George Whiting, Southern Garfish, Yelloweye Mullet, Southern Calamari and Flathead. Western Australian Salmon and Australian Herring were commonly caught in both regions.



Figure 3.38. Characteristics of the South-East and Far South-East recreational fishery from March 2021 to February 2022. A) map of region indicating the statistical area level (1 Adelaide– Central and Hills, 2 Adelaide–North, 3 Adelaide–South, 4 Adelaide–West, 5 Barossa-Yorke-Mid North, 6 South Australia– Outback, and 7 South Australia–South East), B) fishing effort (fisher days) based on the region of residence (statistical area) of fishers; C) effort (fisher days) by method; D) effort (fisher days) by platform; and catch (numbers) for the key species in E) Far South-East and F) South-East. Error bars show standard error, \* indicates relative standard error (RSE) >40%.

# 3.6. Comparison to previous surveys

In this section, data from the present survey were compared to the SA component of the 2000– 01 National Recreational Fishing Survey (Henry and Lyle 2003), and the State-wide surveys conducted in 2007–08 (Jones 2009) and 2013–14 (Giri and Hall 2015) to investigate key developments in the recreational fishery since the early 2000s. Consistent survey methodology and analytical procedures allowed for datasets from the different surveys to be compared. This was despite some differences in how the fisher 'drop-in' adjustment was implemented in the 2000–01 survey (Lyle *et al.* 2009). Regional comparisons are made to the statistical division (SD) level (see Appendix 24), so to compare to the data presented in previous reports.

## 3.6.1. Participation

The estimated number of SA residents aged five years or older who fished at least once a year in SA ranged from ~236K in 2007 to ~357K in 2021 (Fig. 3.39, see also Appendix 25). When expressed as a proportion of the resident population, estimates ranged from 16.2% in 2007, to 23.3% in 2000, in 2021 the participation rate was slightly lower than in 2000 at 22.7% (Fig. 3.39). Except for the South-East, fisher numbers in each residential region were higher in 2021 compared to 2013. The largest differences in 2021 were observed for the Eyre, Adelaide and Outer Adelaide regions, and the number of fishers in these SDs was higher than the previous three surveys (Fig. 3.40, Appendix 25).



Figure 3.39. Fishing participation (number of fishers and proportion of population) in the 12 months prior to May 2000, October 2007, November 2013, and March 2021 by SA residents aged five years or older. Error bars represent one standard error. Data from the 2000–01 and 2007–08 surveys were sourced from (Jones 2009), and data from the 2013–14 survey were sourced from (Giri and Hall 2015).



Figure 3.40. Fishing participation in the 12 months prior to May 2000, October 2007, November 2013, and March 2021 by area of residence for fishers aged five years or older: A) number of persons; and B) proportion of the resident population. Note: regional boundaries applied in 2000 and 2007 were based on the Australian Standard Geographical Classification (Pink, 2011a) rather than the Australian Statistical Geography Standard (Pink, 2011b). Data from the 2000–01 and 2007–08 surveys were

## 3.6.2. Age and gender

The number and participation rate of male fishers ranged from 229K persons or 34% of the population in 2000 to 230K persons or 30% of the population in 2021 (Fig. 3.41 A and B).

sourced from Jones (2009), and data from the 2013–14 survey were sourced from Giri and Hall (2015).

Similarly, female participation rates ranged from 15% of the population or 100K persons in 2000 to 127K persons or 16% of the population in 2021 (Fig. 3.41 C and D).

In 2021, participation rates for males aged 45 to 59 were 35% higher than during 2013 and equivalent to the highest reported (Fig. 3.41 B and D). Participation rates in all other male age groups have been relatively similar between surveys. In 2021, female participation rates were similar to previous surveys for the youngest age group but higher participation rates were observed across all other age groups, particularly the 30-to-59-year age group. The number of female fishers was the highest reported for all age groups except for the 5-to-14-year age group. Female participation rates were also the highest reported across the 15-to-59-year age groups (17–19%).



Figure 3.41. Fishing participation in the 12 months prior to May 2000, October 2007, November 2013, and March 2021 by area of residence for fishers aged five years or older: A) number of males; B) proportion of the resident male population, C) number of females; and D) proportion of the female resident population. Data from the 2000–01 and 2007–08 surveys were sourced from Jones (2009), and data from the 2013–14 survey were sourced from Giri and Hall (2015).
### 3.6.3. Fishing effort

Fishing effort (fisher days) ranged from 1.0 million days in 2013–14 to 1.9 million days in 2000– 01 (Figure 3.42). The most recent estimate in 2021–22 (1.3 million fisher days) was ~37% higher than the 2013–14 survey period. During the 2021–22 survey period, estimates of effort in the marine and freshwater environments were higher than in the previous two surveys, but remained below 2000–01 levels. Estimates for boat-based effort have been similar for each survey period, however, higher levels of shore-based effort were observed during 2021–22 compared with the previous two surveys (Fig. 3.42AB). By method, line fishing effort was higher in 2021–22 than in the previous two surveys but remained below levels observed in 2000–01 (Fig 3.43). Lobster pot and crab net effort was higher in 2021–22 than observed during the previous three surveys.

Regional effort patterns were relatively similar for the past three surveys for the West Coast (including Lower Eyre Peninsula) and Spencer Gulf (North and South combined, Fig. 3.44). During 2021–22, the estimated effort for GSV (Including Northern GSV and Kangaroo Island) was higher than observed in 2013–14, while effort estimates for the South-East, Lower Lakes, Coorong Lagoon and River Murray and Inland/rest of SA were also higher than the previous two surveys. Estimated fisher numbers by region by survey period are presented in Appendices 26 and 27, respectively.



Figure 3.42. Comparison of fishing effort (fisher days) for SA residents aged five years or older who fished in SA during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21: A) based on marine and freshwater waters; and B) based on fishing platform. Data from the 2000–01 and 2007–08 surveys were sourced from Jones (2009) and data from the 2013–14 survey were sourced from Giri and Hall (2015).



Figure 3.43. Comparison of fishing effort (fisher days) by fishing method for SA residents aged five years or older who fished in SA during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. Data from the 2000–01 and 2007–08 surveys were sourced from Jones (2009) and data from the 2013–14 survey were sourced from Giri and Hall (2015).



Figure 3.44. Comparison of fishing effort (fisher days) by fishing regions for SA residents aged five years or older who fished in during survey periods in 2000–01, 2007–08, 2013–14 and 2020–21. Note that as estimates from the 2013–14 survey period were based on the proportional catches presented by Giri and Hall (2014) and may not reflect the exact area represented by the other surveys which have been re-calculated to align with the 2021–22 survey regions. Data from the 2000–01 and 2007–08 surveys were sourced from Jones (2009) and data from the 2013–14 survey were sourced from Giri and Hall (2015). Spencer Gulf includes the northern and southern regions and Gulf St Vincent (GSV) includes the northern region and southern region (GSVKI).

### 3.6.4. Trends in catch

Catch information for key species and survey period are provided in Appendices 28 and 29 and compared in Figures 3.45, 3.46 and 3.47.

### Marine Finfish

An estimated 4.5 million marine finfish were caught (retained and released) by SA recreational fishers during the 2021–22 survey period, compared to 6.9 million in 2013–14, 6.5 million in 2007–08, and 12.2 million in 2000–01. King George Whiting have consistently accounted for over 20% of the marine total finfish catch by number, followed by Australian Herring and Southern Garfish. For most marine finfish species, catch estimates were relatively similar during the 2007–08, 2013–14 and 2021–22 survey periods. However, compared to 2000–01, catch estimates were generally low (Fig. 3.45, 3.46 and 3.47). Notable exceptions are Southern Garfish, which saw similar estimates during survey periods in 2000–01, 2007–08 and 2013-14 (range: 980K-1.5 million), but lower catch estimates in 2021-22 (330K). Similarly, Snapper catches were relatively similar during the 2000-01 and 2013-14 (330-440K) survey periods but were considerably lower during 2021-22 (60K). Reductions in Snapper catches, and higher release rates, reflect the closure of the West Coast, Spencer Gulf and Gulf St Vincent regions to Snapper fishing during the 2021–22 survey period. Catch estimates in 2021–22 for Snook, Mulloway, and Sweep were among the lowest reported, while Southern Bluefin Tuna catch during 2021–22 appeared to be lower than the 2013–14 survey estimate (Fig. 3.46).



Figure 3.45. Total catch numbers (retained and released) and numbers retained (harvested) for key marine finfish species by survey year for South Australian residents aged 5 years or older. Data from the 2000–01 and 2007–08 survey sourced from (Jones, 2009), data from the 2013–14 survey sourced from (Giri & Hall, 2015). Error bars show standard error, \* indicates relative standard error (RSE) >40%.



Figure 3.46. Total catch numbers (retained and released) and numbers retained (harvested) for marine finfish species by survey year for South Australian residents aged 5 years or older. Data from the 2000–01 and 2007–08 survey sourced from (Jones, 2009), data from the 2013–14 survey sourced from (Giri & Hall, 2015). Error bars show standard error, \* indicates relative standard error (RSE) >40%.



Figure 3.47. Total catch numbers (retained and released) and numbers retained (harvested) for marine finfish species by survey year for South Australian residents aged 5 years or older. Data from the 2000–01 and 2007–08 survey sourced from (Jones, 2009), data from the 2013–14 survey sourced from (Giri & Hall, 2015). Error bars show standard error, \* indicates relative standard error (RSE) >40%.

### Marine Invertebrates

Estimated marine invertebrate catch ranged from 4.8 million during the 2021–22 survey period, 3.8 million in 2013–14, 3.3 million in 2007–08 and 4.9 million during 2000–01. Overall, the retained catch of marine invertebrates has been relatively similar between survey periods (range: 2.4–3.9 million). Blue Swimmer Crab has consistently accounted for a large proportion (30–50%) of the invertebrate catch across all surveys, followed by Southern Calamari (10–20%, Fig. 3.48). Pipi also made up a large proportion of the catch in most years, mainly due to their small size. Southern Rock Lobster made up a relatively small proportion of invertebrate catch (2–3%).

The retained catch of marine invertebrates has been relatively similar between surveys (range: 2.4–3.9 million). For most marine invertebrate species, catch estimates have been relatively similar when comparing the previous three surveys (Fig, 3.48 and 3.49). For some species (e.g., Sand Crabs and Razorfish), catch estimates were relatively high in 2000–01, but were lower in the previous three surveys. While for Scallop, higher catch estimates were reported during the 2013–14 survey period, with relatively low estimates in all other years.



Figure 3.48. Total catch numbers (retained and released) and numbers retained (harvested) for key marine invertebrate species by survey year for South Australian residents aged 5 years or older. Data from the 2000–01 and 2007–08 survey sourced from (Jones, 2009), data from the 2013–14 survey sourced from (Giri & Hall, 2015). Error bars show standard error, \* indicates relative standard error (RSE) >40%.



Figure 3.49. Total catch numbers (retained and released) and numbers retained (harvested) for key marine invertebrate species by survey year for South Australian residents aged 5 years or older. Data from the 2000–01 and 2007–08 survey sourced from (Jones, 2009), data from the 2013–14 survey sourced from (Giri & Hall, 2015). Error bars show standard error, \* indicates relative standard error (RSE) >40%.

### **Freshwater**

An estimated 1.4 million freshwater fish and invertebrates were caught during the 2021–22 survey period, compared to 839K in 2013–14, 334K in 2007–08, and 3.2 million in 2000–01. Freshwater Yabby have accounted for a large proportion (30–60%) of the freshwater catch since 2007–08. In each survey, Carp was the most caught freshwater finfish (10–40% of total catch), followed by Golden Perch. In 2021–22, catch proportions of Redfin Perch and Golden Perch were similar (2–3% of total catch).

For most freshwater species, catch estimates have been relatively similar for the past three surveys (Fig. 3.50). Notable exceptions with higher catch during the 2021–22 survey period when compared to the 2013–14 survey were Redfin Perch, Freshwater Yabby and Murray Cod. While Freshwater Catfish and Silver Perch had lower catch estimates during the 2021–22 survey period compared to the 2013–14 survey.



Figure 3.50. Total catch numbers (retained and released) and numbers retained (harvested) for key marine freshwater species by survey period for South Australian residents aged 5 years or older. Data from the 2000–01 and 2007–08 survey sourced from (Jones, 2009), data from the 2013–14 survey sourced from (Giri & Hall, 2015). Error bars show standard error, \* indicates relative standard error (RSE) >40%.

# 3.7. Fisher motivations, attitudes, and awareness

The motivations, attitudes, and awareness of fishers towards recreational fishing activities were based on data from the 'wash-up' survey and are presented as raw un-expanded data based on responses from interviews with a single household member, typically the main fisher or survey reporter.

When asked to classify the importance of recreational fishing compared to other hobbies, participants ranked recreational fishing from 1 (low importance) to 10 (high importance). Overall, about 70% of the respondents classified the activity 5 or higher when compared to other hobbies (Fig. 3.51). The importance of fishing activities as a hobby did not vary among gender, age group or water body fished (Fig. 3.51A, B and D). However, avid fishers who fished ≥15 days tended to classify fishing activities higher than less avid fishers, with most classifying as importance 8 (Fig. 3.51C). About half of participants who did not fish in the previous 12 months classified fishing as of mid (5) to high (10) importance suggesting that fishing activities have an inherent importance, even for those not actively participating in the activity.



Figure 3.51. Percentage of respondents who classified the importance of recreational fishing activities compared to other hobbies by (A) gender, (B) age group, (C) avidity and (D) waterbody. 1 is least important and 10 is most important.

#### 3.7.1. Fishing Motivations

The highest ranked motivations were related to personal relaxation and lifestyle ("to be outdoors ... in the fresh air ... to enjoy nature" and "to relax or unwind") followed by experiential catch and social motives ("for the enjoyment or sport of catching fish, lobsters, etc" and "to spend time with family"). Motivations based on other social interactions and consumption ("to spend time with other friends", "to catch fish to share with friends and family" and "to catch fresh fish, lobsters etc. for food") also displayed a high importance score, whereas spending time alone ("to be on your own ... to get away from people") was less important by most respondents. Catching large fish ("to catch a trophy-sized fish") and participating in competitions ("to compete in fishing competitions of any kind") were rated as being the motivations with the lowest importance for respondents (Fig. 3.52).

For ~75% of respondents, non-catch motives related to socialising, relaxation or environment were the most important reasons for fishing, which highlights the significance of recreational fishing aspects beyond harvest (Fig. 3.53). Consuming or catching fish were the most important motives for less than one third of the fishers interviewed.



Figure 3.52. Percentage and distribution of each importance score to motives to go fishing provided by recreational fishers in the 2021–22 survey. Percentage values reflect the total percentage of negative (left, yellow) and positive (right, blue) responses towards each motivation.



Figure 3.53. Percentage of main motivational categories for fishing identified in interviews with recreational fishers (number of respondents = 698).

#### Factors influencing motivation

All the respondent grouping factors (gender, age, avidity, and water body fished) emerged as significant factors for at least one motivational item. Avidity was the factor that contributed to most significant differences among motivational items, including consumption, social and sport activities. Whereas age and gender were a significant factor for selected social and relaxation motives, and water body fished was only a significant factor for consumption motives (Appendix 30). Based on Wilcoxon signed rank pairwise comparisons between grouping factors, the main differences in responses to motivational items were:

- Female fishers attributed higher importance to the social motive "To spend time with family" than male fishers.
- Fishers older than 75 years attributed less importance to the relaxation motive "To be on your own ... to get away from people" than most fishers in other age groups.
- Fishers older than 60 years attributed less importance to the social motive "To spend time with family" than fishers between 30 and 59 years.
- More avid fishers tended to be more motivated "To catch fish to share with friends and family" than less avid fishers.
- Fishers in freshwater attributed less importance to catch fish for consumption than fishers in saltwater or in both water body types.
- Fishers from Adelaide South were more motivated in participating in fishing competitions than fishers from South Australia – Outback.

#### Comparison with previous surveys

The motivational results of the present survey are generally consistent with the 2000–01 survey, which established that non-catch motives ("to be out-doors" and "to be with the family") and "fish for food" are ranked higher than "fish for sport" as the main motive for fishing. However, in the past two decades there has been an increase in identifying social motivations ("to spend time with family" and "to spend time with other friends") as the main motives for fishing.

#### 3.7.2. Consumptive orientation

In relation to catching something (or more precisely the prospect of catching nothing), most respondents (80% and mean score of 3.88) agreed that they would still consider a fishing trip successful even if no fish were caught. The majority (68%) also indicated that they would still go fishing even if they thought they would not catch anything, and half (50%) disagreed with the statement that were not satisfied unless they at least caught something (Fig. 3.54). These results suggest those fishers benefit and enjoy the aspects of the fishing experience that are unrelated to catching fish, although this does not imply that catch-related aspects are unimportant or incidental, since the prospect of catching a fish remains at the core of recreational fishing.

Most respondents (85%) agreed with the statement "I usually eat the fish I catch", which had the highest mean agreement score (4.08) (Fig. 3.54). This was followed in level of agreement (78% respondents and mean score 3.88) to the statement "I would rather keep just enough fish for a feed than take the bag limit". These responses infer that instead of catching bag limits and storing the catch for later consumption, most fishers prefer to retain enough fish to be consumed fresh ("a feed").

Many statements relating to catching larger fish and catching many fish resulted in largely polarised responses (Fig. 3.54). The importance of catching many fish received an even split between agreement and disagreements, while slightly larger numbers of respondents disagreed with statements on preference of catching larger fish.

### Factors influencing consumptive orientation

Of the grouping factors, gender and water body fished were the main factors that influenced responses to statements relating to consumptive orientation, followed by age and avidity (Appendix 31). Gender was a significant factor in relation to catching categories (catching numbers, size, variety, and something), and water body influenced the consume catch

category. Avidity was the only factor related to the retaining fish orientation. Based on Wilcoxon signed rank pairwise comparisons between grouping factors, the main differences in responses to consumptive orientation items were:

- Male fishers were more motivated to fish where there was a high variety of fishes to catch and the possibility to catch the bag limit, although the prospects of catching large trophy fishes were more important than total catch numbers.
- Freshwater fishers were less motivated by catching high numbers of fish and consuming the catch than fishers in other environments.
- Saltwater fishers were more concerned about catching something during a fishing trip than fishers in other environments.
- Fishers aged 15 to 29 years, fishing in freshwater or both water bodies, were more motivated by the possibility of catching a large trophy fish than older fishers.
- Fishers who did not fish in the previous year generally gave less importance to retaining a fish compared to more avid fishers.
- Fishers who fished between 5 and 10 days in the past year were generally more motivated by retaining all the fish they caught than in the other avidity groups.
- Fishers from Adelaide Central and Hills were more oriented to catching larger fish than fishers from South Australia Outback.





#### 3.7.3. Fisher awareness and opinions

As evidenced in the previous sections, the importance of fishing activities to recreational fishers goes beyond catching fish for consumption. Our findings suggest that recreational fishing activities can help to relieve stress and strengthen social and environmental bonds. Because of that, fishers usually have a vested interest in ensuring fisheries resources are available and accessible to next generations. In this context, respondents were asked to identify the level of agreement with stewardship statements, which were classified as 'strongly agree', 'agree', 'disagree' and 'strongly disagree'.

All respondents agreed that the sustainable management of fish stocks is important to recreational fisheries. Many respondents (83%) agreed that recreational fishers comply with the fishing rules and regulations and that they care about fisheries resources (92%), most identifying themselves as stewards of those resources (96%) (Fig. 3.55).



Figure 3.55. Percentage and distribution of agreement score to stewardship statements provided by recreational fishers for the (2021–22 survey period). Percentage values reflect the total percentage of agreement (left, yellow) and disagreement (right, blue) towards each motivation.

### 4. DISCUSSION

### 4.1. General

This study represents the fourth comprehensive assessment of recreational fishing in SA and complements other more targeted assessments of specific fishing activities. While there were two surveys on recreational fishing prior to 2000 (Philipson *et al.* 1986, Cierpicki 1997), the methods used for these studies were not comparable with contemporary surveys. By utilising the same methodological approach applied in the 2000–01 National Recreational Fishing Survey, it was possible to make valid comparisons for SA residents over time. While the contribution of non-residents has not been measured as part of this study, the most recent estimate of non-resident effort (fisher days) in SA was low (4.9%) relative to resident effort (Henry and Lyle 2003). Economic factors were also not investigated in this study, as they were the focus of the National Social and Economic Survey of Recreational Fishers in 2019 (FRDC 2018-161), which is due to be published in in early 2023. One of the benefits of assessing the economic value of recreational fishing at a national scale is that the contribution of interstate visitors to the SA economy can also be captured.

## 4.2. Fishing participation

Recreational fishing activity was monitored between March 2021 and February 2022. Over 297K SA residents were estimated to have fished in SA during this period, which was fewer than estimated from the screening survey for the 12 months prior to March 2021 (i.e., 357K fishers). The difference in participation is likely due to recall bias, which can result in an overestimation of the activity of interest (Lyle *et al.* 2019). The estimated number of active fishers during the 2021–22 survey period was 17% lower than in 2021 (based on the screening survey), but was similar to the number of active fishers in 2013–14 (Giri and Hall 2015). Interestingly, at the time of the screening interview, an estimated 12% of the SA residents who stated they had fished in 2021 (equivalent to about 42K fishers) rated themselves as unlikely to do any recreational fishing during 2021–22. This was confirmed by the 'wash-up' survey where the main reasons for fishing less than expected were COVID-19 (25%), work/business related (19%), personal health/fitness (14%) and home/family related (12%).

Since 2000 there have been some notable changes in the recreational fishery in SA. Compared to 2000, participation estimates were lower in 2007 and 2013, both in absolute and relative terms. During 2021, fisher numbers were higher than the previous three surveys. The 2021 participation rate was also higher than the previous two surveys and was only marginally lower than the 2000 estimate. This coincided with an increase in the resident population in SA

of ~20% between 2001 and 2021 (ABS 2022). The most marked increase in the SA population was for the 60-plus age group which increased by about 70% since 2001 (ABS 2022). This trend was reflected in the data with the number of fishers in the 60-plus age group more than double compared to 2000. The higher number of older fishers during 2021 was most notable for females, with an increase of 20% observed compared with 2000. Despite higher estimates of the number of female fishers during 2021, recreational fishing remained more popular among males.

Female participation rates in 2021 were generally higher than the previous three surveys, except for the 5–14 years age group. This is likely a result of changes to leisure constraints such as perceptions of skill or appropriateness of the activity, social barriers (e.g., not having a social group to participate with), or structural constraints (e.g. lack of time, money, access or equipment) (Sutton 2007). The influence that COVID-19 had on female participation rates during the survey period is unclear, however, it is feasible that fishing opportunities increased for females during this period, particularly where family units fished together. This is supported by the 'wash-up' survey, which indicated that female fishers were motivated by social motives such as spending more time with family.

Overall, male participation rates in 2021 were generally higher than the previous two surveys except for the 15–29 years age group. The leisure constraints influencing male participation rates differ to those facing females, and it is likely that for both genders, age influences the amount and type of constraints (Sutton *et al.* 2009). This was evident for the 45–59 years age group, with higher participation during 2021 than the previous three surveys, likely due to the retention of the large cohort of 30–44-year-old fishers that were prominent during 2000. Overall, participation rates still tended to be highest amongst children (5–14 years age group), indicating an underlying decline in retention (rather than recruitment) of persons to the pastime. When broader demographic trends were considered, the high number of fishers across 30–59 years age groups, and the higher participation rates amongst the 5–14 years age group, suggest that overall participation in recreational fishing in SA is likely to stabilise or increase further over the short term. This trend will continue unless there is a decline in fishing amongst the younger age groups.

By region of residence, higher fisher numbers were estimated around SA in 2021, with the largest differences for residents of Adelaide and Outer Adelaide. This aligns with the high population growth in Adelaide since 2001, particularly in the Adelaide-North region (ABS 2022). While the Outback region (including the West Coast, Eyre Peninsula and northern rural SA) has experienced limited population growth in the past 20 years, Outback residents had

the highest participation rate. Participation rates from the Barossa-Yorke-Mid North and South-East were also above the State average. These results highlight the importance of recreational fishing to residents of regional communities.

## 4.3. Effort

During the 12-month survey period, recreational fishers accounted for ~1.3 million fisher days of effort, with an average of 4.4 days per fisher. Individually, effort levels were highly skewed with most persons fishing less than 5 days, whereas a small proportion of avid fishers made a large contribution to the total fishing effort (and catch). This highlights the potential for a relatively small proportion of fishers to have a considerable contribution to the total catch and effort. Despite the large number of fishers and high participation rates during the 2021–22 survey period, effort (fisher days) was low compared to the 2000–01 survey period. This was, in part, due to lower estimates of effort in Spencer Gulf and Gulf St Vincent during the 2021–22 survey period compared to 2000–01.

Saltwater fishing accounted for the most effort during the 2021–22 survey period, particularly in the inshore coastal environment. Saltwater effort was high during the 2021–22 survey period compared to 2013–14 but remained below 2000–01 levels. This was largely driven by shore-based activity, as boat-based effort has been relatively similar for each survey. During the 2021–22 survey period shore-based effort was higher than in 2013–14 but remained below 2000–01 levels. Given that species with high levels of shore-based effort (and catch) such as Blue Swimmer Crab and Pipi are highly accessible, higher effort may be driven in part by increased information exchange and spread of fishing knowledge through online forums and social media. Freshwater fishing effort was also higher during the 2021–22 survey period compared to 2013–14 but was lower than 2000–01 levels.

## 4.4. Catch

The catch composition and relative importance of key species has mostly been consistent between surveys. Despite this, catches of several key species have varied, likely due to differences in effort and changes in fishing practices and species availability. For most marine taxa catch estimates were relatively similar during the 2007–08, 2013–14 and 2021–22 survey periods, however, for many species catch estimates were low compared to 2000–01.

The most obvious difference in catches since the 2013–14 survey was for Snapper. Previous surveys indicated that Snapper was one of the more commonly caught species in the State, particularly for boat-based fishers in Spencer Gulf and Gulf St Vincent. The low catch of

Snapper during the 2021–22 survey period was consistent with the absence of targeted effort during the survey period as a result of the fishery closures, which also accounted for the high release rates. Most of the Snapper catch (released) was reported from Spencer Gulf, which was likely due to the overlap between King George Whiting and Snapper grounds in this region. Estimates of Snapper catches outside of Spencer Gulf generally had low precision due to the small number of catches reported. During the survey period, the South-East region was open to recreational fishers with mandatory reporting required for all Snapper catches. Given that survey estimates for Snapper in the South-East were imprecise due to the low number of events reported, an independent survey would be required to verify data from mandatory reporting.

Catch estimates for Southern Garfish were also notably low in 2021–22 compared to the previous three surveys. This likely reflects the revised management arrangements that have been in place since 2005 to allow for stock recovery (Drew *et al.* 2021). Overall, release rates were low in Northern Spencer Gulf (16%) and the average size of legal-size fish (from on-site sampling) was also low compared to other regions sampled. This contrasted with Northern Gulf St Vincent which had slightly larger legal-size fish than Northern Spencer Gulf but higher release rates (25%), potentially indicating higher numbers of undersize fish.

King George Whiting catch estimates have been relatively similar for the previous three surveys but remain lower than what was reported during 2000–01. Despite similarity in survey catch estimates since 2007–08, the most recent stock assessment suggests marginal declines in recruitment and biomass in the Spencer Gulf and Gulf St Vincent/Kangaroo Island stocks. High release rates from Northern Spencer Gulf (51%) are likely reflective of the recruitment of King George Whiting into nursery areas in the northern gulfs, with catch of sub-adult fish around the minimum legal-size limit common.

Catch estimates for Australian Herring have also been similar for the previous three surveys but remain lower than what was reported in 2000–01. Lower estimated catch may be due to reduced effort or targeting, noting that just 32% of the Australian Herring catch was targeted during the 2021–22 survey period. Fish availability is also a likely factor in lower recreational catch estimates, and this is complicated by the life history of Australian Herring which spawn in Western Australia and rely on larval transport to nursery areas in SA. As such, they are likely to be highly influenced by environmental processes, and variable recruitment is likely to occur.

At the State-wide level, estimates of Blue Swimmer Crab catch have been similar for each survey period. Regionally, catch has fluctuated with low levels observed in Gulf St Vincent during the 2013–14 survey and comparatively high catch estimates during the 2007–08 and 2021–22 surveys. While the total catch in Gulf St Vincent was higher during the 2021–22 survey than the previous two surveys, higher release rates were observed in 2021–22 compared with 2013–14. This trend was driven by high levels of shore-based effort in Northern Gulf St Vincent and is consistent with the most recent stock assessment which indicated high numbers of undersize Blue Swimmer Crab in Gulf St Vincent during March 2021 (Beckmann and Hooper 2022). In Spencer Gulf, recreational catch was high during the 2013–14 survey compared with lower estimates in 2007–08 and 2021–22. Lower catch estimates from Spencer Gulf are likely due to reduced effort and changes to bag and boat limits introduced since 2013. Outside of the gulfs, most of the catch came from the West Coast, however, the localised distribution of Blue Swimmer Crab in this region resulted in low sample size and poor precision around catch estimates.

Pipi have a localised distribution with the largest proportion of catch taken from the area near Goolwa in the South-East region. As a result, State-wide estimates of catch are often imprecise. Despite this, the State-wide harvest was higher in 2021–22 compared to 2013–14. This was supported by the results of an on-site survey conducted during 2020–21 which showed higher catch rates, and larger Pipi size compared to 2013–14 (Durante *et al.* 2022). As the on-site catch estimate for Goolwa exceeded the State-wide estimate, and had a higher level of precision, on-site surveys continue to be the most reliable method to evaluate trends in recreational Pipi catch.

Trends in the key species highlight the complex and dynamic nature of the recreational fishery and emphasise the need for species-specific management at appropriate regional and temporal scales. While substantial changes in catch estimates may have occurred for several other key species, interpretation of catch trends is hampered by low levels of precision around catch estimates.

## 4.1. Improving the precision of survey estimates

A key recommendation from a National Workshop in 2018 (Beckmann *et al.* 2019) was the development of a national register of recreational fishers to enable probabilistic sampling of the target population. Without this targeted sampling frame, it is not possible to achieve full coverage of all recreational fishers in SA, and large-scale surveys must rely on broad scale population sampling to generate estimates of participation, catch and effort. While the

sampling frame used in this study provides a comprehensive database of phone numbers of SA residents, it is generally cost-prohibitive to increase the sampling coverage required to reduce bias and increase precision for many species, and interstate fishers are considered out-of-scope. For some species with a substantial land-based component and limited geographical distribution (e.g., Goolwa Pipi), on-site surveys may provide a more statistically robust method for estimating recreational catch and would also capture the input of non-resident fishers.

Despite the challenges around sampling frames, several key improvements were made to the survey methodology in the present study. Firstly, the sample size (diary completion) of 1,254 households in 2021–22 was considerably larger than the 2013–14 survey (561 households) and was comparable with the 2007-08 survey (1,261 households). To achieve this sample size, nearly 30,000 households were contacted in the present study, which was more than five times the net sample size reported in 2013–14 and more than four times the net sample size reported in 2007–08. The substantial increase in net sample size was required due to declining response rates which have been well documented in other jurisdictions (Stedman et al. 2019). Secondly, during screening, additional demographic variables were collected (e.g., education and country of birth) to improve calibration of survey estimates to population benchmarks. Thirdly, the data collection platform used to collect respondent data was entirely electronic. allowing for real-time data validation and reducing potential errors. Finally, harvest weights were calculated using updated information collected from on-site sampling or supplementary data sources where available. A thorough review of the available length-weight relationships was undertaken and where possible, harvest weights were determined using a regional mean weight. While estimates of mean weight are achievable through on-site sampling for common and widely-distributed species, rare species or those with a more localised distribution are challenging to sample. In addition, estimates of harvest weight for larger species are highly influenced by mean weight data so accurate and up-to date data is critical to inform these calculations.

## 4.2. Impact of COVID-19

Initial studies into the impacts of the global pandemic associated with COVID-19 (severe acute respiratory syndrome coronavirus 2, SARS-CoV-2) have demonstrated differences in fishing activity which varied by age demographics and residential location during 2020 (Ryan *et al.* 2021). While there was no significant community transmission in SA during the screening period of the present study, there may have been some influence on fishing behaviour during this period due to health concerns and recommendations around social distancing. In addition,

there was a three-day lockdown period during November 2020, when recreational fishing was not permitted.

During the phone survey period, significant community transmission occurred from December 2021. A seven-day lockdown occurred in July 2021 and no recreational fishing was permitted. This was highlighted by the 'wash-up' survey where COVID-19 was the most common reason for not fishing during the survey period, particularly for the 45–74-year-old age group. It is likely that social distancing and travel restrictions due to COVID-19 impacted on recreational fishing activity during the diary period. While fishing activity may initially have been reduced, studies in Western Australia indicated that some locations experienced increased levels of fishing activity due to increased domestic travel during 2020 (Ryan *et al.* 2021).

# 4.3. Future directions

The present study provides some insight into the complex socio-demographic factors that influence recreational fishing participation and demonstrates the need for on-going assessments to establish trends and inform future management. The results of this study highlight the dynamic and diverse nature of the recreational fishing sector, and the need to implement more regular collection of information. The extended periods between surveys and lack of precision around survey estimates for many species remain key barriers to using recreational fishing data to inform fishery management and harvest strategy development.

To address the time lag between surveys, voluntary-app reporting is currently being assessed as part of FRDC Project No. 2020-056. This project will examine the probability-based estimates from this survey compared to non-probability app-based estimates collected during the same period to understand the differences in data quality and potential sources of bias. However, as app-based surveys are voluntary and it is not possible to measure the level of non-response, there will be an on-going need for large-scale probability-based surveys to collect population level information. As these large-scale surveys generally do not adequately capture rare fishing events or uncommon species, improving the precision around estimates for many species will continue to be a challenge.

Finally, interstate catch and effort has not been quantified in SA since the 2000–01 National Survey. For some species and regions, there may be a high degree of interstate catch and effort which could be quantified through a probability-based on-site survey. Given the large number of potential access points, it is likely that supplementary data (e.g., remote cameras to assess boat-retrievals) would be required to improve temporal coverage and provide more reliable estimates of fishing catch and effort.

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# 6. APPENDIX

**Appendix 1.** Common names and taxa of species (or species groupings) analysed in the 2021–22 South Australia Recreational Fishing Survey.

| Common name   | Таха                                       |  |  |
|---|--|--|--|
| Marine Fish   |  |  |  |
| Albacore  | Thunnus alalunga                           |  |  |
| Barracouta  | Thyrsites atun                             |  |  |
| Blue Devil, Western                                 | Paraplesiops sinclairi                     |  |  |
| Bream, Black  | Acanthopagrus butcheri                     |  |  |
| Cod, Red Rock                                       | Pseudophycis bachus                        |  |  |
| Cod, Unknown  | Gadiformes                                 |  |  |
| Cowfish   | Tetraodontidae                             |  |  |
| Drummer, Silver                                     | Kyphosus sydneyanus                        |  |  |
| Eel, Conger   | Conger verreauxi                           |  |  |
| Finfish, Unknown                                    | Actinopterygii                             |  |  |
| Flathead  | Platycephalidae                            |  |  |
| Flounder  | Bothidae & Pleuronectidae                  |  |  |
| Garfish, Southern                                   | Hyporhamphus melanochir                    |  |  |
| Gemfish   | Rexea solandri                             |  |  |
| Groper, Western Blue                                | Achoerodus gouldii                         |  |  |
| Gurnard   | Chelidonichthys kumu                       |  |  |
| Harlequin Fish                                      | Othos dentex                               |  |  |
| Herring, Australian                                 | Arripis georgianus                         |  |  |
| Kingfish, Yellowtail                                | Seriola lalandi                            |  |  |
| Knifejaw  | Oplegnathus woodwardi                      |  |  |
| Leatherjacket (Oceanjacket, Letherjacket)           | Monacanthidae                              |  |  |
| Ling  | Ophidiidae                                 |  |  |
| Luderick/Zebrafish                                  | Girella tricuspidata                       |  |  |
| Mackerel, Blue Slimy                                | Scomber australasicus                      |  |  |
| Mackerel, Jack                                      | Trachurus declivis                         |  |  |
| Mackerel, Scad                                      | Trachurus novaezelandiae                   |  |  |
| Mackerel, unknown                                   | Trachurus spp.                             |  |  |
| Moonlighter   | Tilodon sexfasciatus                       |  |  |
| Morwong, Blue                                       | Nemadactylus valenciennesi or N. douglasii |  |  |
| Mullet, Red (goatfish)                              | Upeneichthys vlamingii                     |  |  |
| Mullet, sea   | Mugil cephalus                             |  |  |
| Mullet, Unknown                                     | Mugliformes                                |  |  |
| Mullet, Yelloweye                                   | Aldrichetta forsteri                       |  |  |
| Mulloway  | Argyrosomus japonicus                      |  |  |
| Perch, Gurnard                                      | Neosebastes family                         |  |  |
| Perch, Magpie                                       | Cheilodactylus nigripes                    |  |  |
| Perch, Striped (Western Striped Grunter)            | Pelates octolineatus                       |  |  |
| Rays and Skates                                     | Batoidea                                   |  |  |
| Redfish, Bight (Nannygai, Red Snapper, Swallowtail) | Centroberyx spp.                           |  |  |
| Salmon, Western Australian                          | Arripis truttaceus                         |  |  |
| Samsonfish  | Seriola dumerili & S. hippos               |  |  |
| Sergeant Baker                                      | Hime purpurissatus                         |  |  |

Continued over page

# Appendix 1. Continued.

| Common name              | Таха   |  |  |
|--------------------------|--|--|--|
| Marine Fish              |  |  |  |
| Shark, Bronze Whaler     | Carcharhinus spp.                            |  |  |
| Shark, Dogfish           | Squalus spp.                                 |  |  |
| Shark, Gummy             | Mustelus antarcticus                         |  |  |
| Shark, Port Jackson      | Heterodontus portusjacksoni                  |  |  |
| Shark, School            | Galeorhinus galeus                           |  |  |
| Shark, Unknown           | Elasmobranchii                               |  |  |
| Snapper                  | Chrysophrys auratus                          |  |  |
| Snook                    | Sphyraena spp.                               |  |  |
| Sweep                    | Scorpis spp.                                 |  |  |
| Tailor                   | Pomatomus saltatrix                          |  |  |
| Toadfish                 | Tetraodontidae                               |  |  |
| Trevalla, Blue Eye       | Hyperoglyphe antarctica                      |  |  |
| Trevally, Silver         | Pseudocaranx sp.                             |  |  |
| Trevally, Unknown        | Caranginae spp.                              |  |  |
| Trumpeter, Striped       | Latris lineata                               |  |  |
| Trumpeter, Unknown       | Latridae                                     |  |  |
| Tuna, Southern Bluefin   | Thunnus maccoyii                             |  |  |
| Whiting, King George     | Sillaginodes punctata                        |  |  |
| Whiting, School (Silver) | Sillago bassensis, S. flindersi & S. robusta |  |  |
| Whiting, Unknown         | Sillaginidae                                 |  |  |
| Whiting, Weedy           | Haletta semifasciata                         |  |  |
| Whiting, Yellowfin       | Sillago schomburgkii                         |  |  |
| Wrasse, Bluethroat       | Notolabrus tetricus                          |  |  |
| Wrasse, Unknown          | Labridae                                     |  |  |
| Marine Invertebrates     |  |  |  |
| Abalone, Blacklip        | Haliotis rubra                               |  |  |
| Abalone, Greenlip        | Haliotis laevigata                           |  |  |
| Abalone, Unspecified     | Haliotis spp.                                |  |  |
| Calamari, Southern       | Sepioteuthis australis                       |  |  |
| Cockle, Mud              | Katelysia spp.                               |  |  |
| Cockle, Unspecified      | Veneridae                                    |  |  |
| Crab, Blue Swimmer       | Portunus armatus                             |  |  |
| Crab, Other              | Brachyura                                    |  |  |
| Crab, Sand               | Ovalipes australiensis                       |  |  |
| Cuttlefish               | Sepia spp.                                   |  |  |
| Non-fish, Other          | Various other non-fish taxa                  |  |  |
| Octopus                  | Octopodidae                                  |  |  |
| Pipi (Cockle)            | Donax spp.                                   |  |  |
| Razorfish                | Pinna dolabrata                              |  |  |
| Rock Lobster, Southern   | Jasus edwardsii                              |  |  |
| Scallop                  | Pectinidae                                   |  |  |
| Sea Urchin               | Echinidae                                    |  |  |
| Squid, Arrow             | Nototodarus gouldi                           |  |  |
| Worm                     | Annelida                                     |  |  |

Continued over page

# Appendix 1. Continued.

| Common name            | Таха                  |  |  |
|------------------------|-----------------------|--|--|
| Freshwater species     |                       |  |  |
| Bream, Bony            | Nematalosa erebi      |  |  |
| Carp                   | Cyprinus carpio       |  |  |
| Catfish, Freshwater    | Plotosidae            |  |  |
| Cod, Murray            | Maccullochella peelii |  |  |
| Eel, Unspecified       | Anguillidae           |  |  |
| Perch, Golden (Callop) | Macquaria ambigua     |  |  |
| Perch, Redfin          | Perca fluviatilis     |  |  |
| Perch, Silver          | Bidyanus bidyanus     |  |  |
| Shrimp, Freshwater     | Paratya australiensis |  |  |
| Trout, Brown           | Salmo trutta          |  |  |
| Trout, Rainbow         | Oncorhynchus mykiss   |  |  |
| Yabby, Freshwater      | Cherax destructor     |  |  |

**Appendix 2.** Description of species-specific average weight calculations from on-site sampling and table with on-site sampling locations.

Length distribution of 55 species harvested during recreational fishing activities were collected from over 1,570 interviews conducted during 114 interview days at boat ramps and piers throughout SA between March 2021 and February 2022. Species-specific weight-length relationships (Appendix 6) were used to transform length distributions into average weights, which were multiplied by catches throughout the State to estimate recreational harvest weight for each species. When possible, average weights were calculated for each region (West Coast, Lower Eyre Peninsula, Southern Spencer Gulf, Northern Spencer Gulf, Gulf St. Vincent and KI, Northern Gulf St. Vincent, South-East and Far South-East), to providing the best representation of local recreational harvests. The occurrence and number of individuals measured varied greatly among different species (Fig. 6.3.1), regions and seasons (Fig. 6.3.2). Average individual weight also varied among the different regions sampled (Fig. 6.3.3). Some species, such as King George Whiting, Australian Herring and Western Australian Salmon, displayed different average weights between regions (Fig. 6.3.3).

| Region          | Location   |  | Region                                    | Location   |
|-----------------|--|--|---|--|
| Gulf St Vincent | Sulf St Vincent Ardrossan Jetty<br>Brighton Jetty<br>Edithburgh Boat Ramp<br>Edithburgh Jetty<br>Marion Bay Boat Ramp<br>Marion Bay Jetty<br>North Haven Boat Ramp<br>O'Sullivan's Beach Boat<br>Port Noarlunga Jetty<br>Port Vincent Boat Ramp<br>Rapid Bay Jetty<br>Semaphore Jetty<br>St Kilda Boat Ramp<br>Stansbury Boat Ramp<br>Stansbury Jetty<br>West Beach Boat Ramp<br>Wirrina Boat Ramp |  | Lower Eyre<br>Peninsula<br>and West Coast | Coffin Bav Boat Ramp<br>Ceduna Boat Ramp<br>Lockswell Beach<br>Smoky Bay Boat Ramp<br>Streaky Bay Boat Ramp<br>Venus Bay Boat Ramp |
|                 |  |  | South East<br>and Far South               | Beachport Boat Ramp<br>Goolwa Boat Ramp<br>Port MacDonnell Boat<br>Robe Boat Ramp<br>Victor Harbor Boat<br>Waitpinga Beach         |
| Spencer Gulf    | Axel Stenross Boat Ramp<br>Billy Lights Point Boat Ramp<br>Point Turton Boat Ramp<br>Port Augusta Boat Ramp<br>Port Hughes Boat Ramp<br>Port Hughes Jetty<br>Port Victoria Boat Ramp<br>Port Victoria Jetty<br>Tumby Bay Boat Ramp<br>Wallaroo Boat Ramp<br>Whyalla Boat Ramp  |  |   |  |

### Appendix 2. Continued



Fig 6.3.1. Number of interviews reporting the harvest of each species and the total number of individuals measured. Values only shown for species measured in at least 10 interviews.



#### Appendix 2. Continued

Fig 6.3.2. Number of individuals measured during on-site sampling in different regions for: (A) King George Whiting, (B) Southern Calamari, (C) Blue Swimmer Crab, (D) Australian Herring, (E) Southern Garfish and (F) Western Australian Salmon. Seasons are identified in different colours. Region names: SSG (Southern Spencer Gulf), NSG (Northern Spencer Gulf), GSVKI (Gulf St. Vincent / Kangaroo Island), NGSV (Northern Gulf St. Vincent), SE (Southeast) and FSE (Far Southeast).




Fig 6.3.3. Boxplot of individual weights calculated from weight-length relationships in different regions for: (A) King George Whiting, (B) Southern Calamari, (C) Blue Swimmer Crab, (D) Australian Herring, (E) Southern Garfish and (F) Western Australian Salmon. Average weights from regions linked by brackets are statistically different at (\*) 0.05, (\*\*) 0.005, (\*\*\*) 0.0005 and (\*\*\*\*) <0.0005 confidence levels (T-test with Bonferroni adjustment).

#### Appendix 2. Continued

Sample sizes decreased and uncertainty increased when data were split among regions to provide regional-specific average weights for the estimation of recreational harvest weight. To calculate average weights with the highest possible resolution and avoid bias due to small sample sizes, individuals measured in different regions were grouped when: (a) sample size was considered small compared to other regions or <20; (b) average individual weight was not significantly different to the closest region; and/or (c) measurements were not taken during all the seasons the species had been harvested in other regions. Regional weight averages for species with enough measurements data are in Appendix 6.

State-wide average weights were calculated for species with limited number of measurements taken during on-site sampling. When available, length and weight data from other research projects in SA were included for species with small number of measurements taken during on-site sampling (most freshwater species, Mulloway, Western Australian Salmon, Pipi and Southern Bluefin Tuna). For other species like Snapper and Southern Rock Lobster, weight data from commercial and charter sectors were included (see methods). When data were not available, average weights from previous surveys and experts' advice were used to estimate average weights.

It was also not possible to consider temporal variations in size/weight or issues around gear selectivity, skill and personal ethics of individual fishers. As a result, the simple application of an average individual weight introduces an additional degree of uncertainty to the harvest (weight) estimates. The grouping of species for reporting purposes can further confound these calculations where there are differences in size for individual species considered as a group. For these reasons it is necessary to view harvest weights as indicative rather than absolute point estimates of recreational fishery production.

**Appendix 3.** Number of recreational fishing interviews undertaken by region and season during on-site sampling between March 2021 and February 2022. Region names: SSG (Southern Spencer Gulf), NSG (Northern Spencer Gulf), GSVKI (Gulf St. Vincent / Kangaroo Island), NGSV (Northern Gulf St. Vincent), SE (South-East) and FSE (Far South-East).



**Appendix 4.** Boxplot of length (mm) for each species measured during on-site recreational fishing surveys between 2021 and 2022. Number of samples (count) and mean length are shown. Data are only shown for species with >20 samples. The box area includes 50% of the data, with the median value represented inside. Whiskers represent minimum and maximum values of distributions and dots are considered outlier values. All lengths recorded as total length (i.e. tip of the snout to the tip of the longer lobe of the caudal fin) except for (\*) Scallop (shell width), Southern Rock Lobster (carapace length), Blue Swimmer Crab (carapace width), Southern Calamari (mantle length), Southern Garfish (total length: measured form the tip of the upper jaw).



**Appendix 5.** References to weight-length relationships used in the present report to estimate average weight of recreational catches for species of interest, from lengths collected during on-site sampling. CAAB, Codes for Australian Aquatic Biota.

| Common name   | CAAB | Scientific             | Weight-Length                       |
|---|------|------------------------|-------------------------------------|
| Australian Herring                                    | 76   | Arripis georgianus     | (McGlennon and Kinloch<br>1997)     |
| Bight Redfish (Nannygai, Red<br>Snapper, Swallowtail) | 119  | Centroberyx spp.       | (Smallwood <i>et al.</i> 2018)      |
| Blue Slimy Mackerel                                   | 92   | Scomber australasicus  | (Smallwood <i>et al.</i> 2018)      |
| Blue Swimmer Crab                                     | 249  | Portunus armatus       | (Beckmann and Hooper 2017)          |
| Cuttlefish  | 283  | Sepia spp.             | (Hall 1999)                         |
| Flathead  | 60   | Platycephalidae family | (Smallwood et al. 2018)             |
| Greenlip Abalone                                      | 269  | Haliotis laevigata     | (Carlson <i>et al.</i> 2006)        |
| Gummy Shark   | 147  | Mustelus antarcticus   | (Mcauley and<br>Simpfendorfer 2003) |
| King George Whiting                                   | 210  | Sillaginodes punctata  | (McGarvey and Fowler 2002)          |
| Leatherjacket   | 87   | Monacanthidae family   | (Grove-Jones and<br>Burnell 1991)   |
| Red Mullet  | 114  | Upeneichthys vlamingii | (Türker and Bal 2018)               |
| Sand Crab   | 251  | Ovalipes australiensis | (Deakin 1996)                       |
| Scallop   | 279  | Pectinidae Family      | (Semmens <i>et al.</i> 2020)        |
| School Whiting  | 355  | Sillago bassensis,     | (Smallwood <i>et al.</i> 2018)      |
| Snapper   | 162  | Chrysophrys auratus    | (Fowler <i>et al.</i> 2020)         |
| Snook   | 170  | Sphyraena spp.         | (McGlennon and Kinloch 1997)        |
| Southern Bluefin Tuna                                 | 200  | Thunnus maccoyii       | (DSI Consulting Pty Ltd 2006)       |
| Southern Calamari                                     | 286  | Sepioteuthis australis | (Steer <i>et al.</i> 2006)          |
| Southern Garfish                                      | 65   | Hemiramphidae          | (Steer et al. 2012)                 |
| Southern Rock Lobster                                 | 255  | Jasus edwardsii        | (McLeay <i>et al.</i> 2017)         |
| Striped Perch (Western Striped Grunter)               | 191  | Pelates octolineatus   | (Smallwood <i>et al.</i> 2018)      |
| Sweep   | 175  | Scorpididae family     | (Smallwood et al. 2018)             |
| Unspecified wrasse                                    | 221  | Labridae family        | (Smallwood <i>et al.</i> 2018)      |
| Weedy Whiting   | 211  | Haletta semifasciata   | (Froese <i>et al.</i> 2014)         |
| Western Australian Salmon                             | 136  | Arripis truttaceus     | SARDI (unpublished                  |
| Yelloweye Mullet                                      | 116  | Aldrichetta forsteri   | (Froese <i>et al.</i> 2014)         |
| Yellowfin Whiting                                     | 214  | Sillago schomburgkii   | (Ferguson 1999)                     |
| Yellowtail Kingfish                                   | 84   | Seriola lalandi        | (Mcauley and<br>Simpfendorfer 2003) |

**Appendix 6.** Regional average weights for fish species sampled during on-site sampling. Region names: SSG (Southern Spencer Gulf), NSG (Northern Spencer Gulf), GSVKI (Gulf St. Vincent / Kangaroo Island), NGSV (Northern Gulf St. Vincent), SE (South-East) and FSE (Far South-East), LEP (Lower Eyre Peninsula), WC (West Coast).

| Species               | Region                | Sample | Average weight | SE (g)  |
|-----------------------|-----------------------|--------|----------------|---------|
| Australian Herring    | GSVKI; Coorong; SE &  | 101    | 85.35          | 3.37    |
|                       | NGSV                  | 183    | 93.60          | 3.02    |
|                       | NSG                   | 133    | 78.84          | 2.43    |
|                       | SSG                   | 166    | 83.87          | 2.80    |
|                       | WC & LEP              | 162    | 97.65          | 3.08    |
| Western Australian    | Coorong               | 41     | 124.25         | 3.51    |
| Salmon                | GSVKI & NGSV          | 167    | 527.94         | 29.14   |
|                       | NSG                   | 42     | 250.80         | 19.82   |
|                       | SE & FSE              | 150    | 172.55         | 5.64    |
|                       | SSG                   | 68     | 989.65         | 76.91   |
|                       | WC & LEP              | 136    | 734.83         | 85.07   |
| Blue Mackerel         | GSVKI & SE            | 63     | 451.45         | 33.05   |
|                       | NGSV; NSG & SSG       | 129    | 154.04         | 6.05    |
| Blue Swimmer Crab     | NGSV; GSVKI; SE & FSE | 1,556  | 274.91         | 1.56    |
|                       | NSG                   | 986    | 265.25         | 2.76    |
|                       | SSG                   | 255    | 300.29         | 5.29    |
|                       | WC & LEP              | 31     | 246.93         | 11.21   |
| Southern Calamari     | GSVKI; SE & FSE       | 380    | 416.01         | 12.11   |
|                       | NGSV                  | 802    | 386.98         | 6.93    |
|                       | NSG                   | 528    | 411.02         | 9.94    |
|                       | WC; LEP & SSG         | 798    | 380.57         | 8.38    |
| King George Whiting   | GSVKI; SE & FSE       | 573    | 303.05         | 3.61    |
|                       | NGSV                  | 761    | 257.01         | 2.19    |
|                       | NSG                   | 489    | 251.64         | 3.73    |
|                       | SSG                   | 1,881  | 305.42         | 2.10    |
|                       | WC & LEP              | 1,461  | 232.87         | 1.37    |
| Mulloway              | Coorong               | -      | 2,020.00       | -       |
|                       | WC; GSVKI; NGSV; SE & | 7      | 12,710.00      | 2,452.1 |
| Snapper               | FSE                   | 23     | 1,682.75       | 412.89  |
|                       | SE                    | 203    | 2,260.26       | 71.47   |
| Southern Bluefin Tuna | LEP                   | 129    | 14,440.70      | 2,640.9 |
|                       | FSE                   | 483    | 23,570.16      | 4,225.8 |
|                       | GSVKI                 | 58     | 12,726.22      | 3,162.2 |
|                       | SE                    | 404    | 9,781.93       | 148.63  |
|                       | WC                    | 50     | 5,400.00       | 1,000.0 |
| Southern Garfish      | GSVKI; SE & FSE       | 179    | 94.61          | 2.34    |
|                       | NGSV                  | 247    | 83.53          | 3.81    |
|                       | NSG                   | 155    | 74.90          | 1.44    |
|                       | SSG                   | 240    | 90.67          | 1.73    |
|                       | WC & LEP              | 51     | 105.57         | 3.61    |
| Southern Rock Lobster | GSVKI; SE & FSE       | 507    | 890.84         | 21.14   |
|                       | WC & LEP              | -      | 1,005.00       | -       |
| Sweep                 | GSVKI & NGSV          | 34     | 593.54         | 82.12   |
|                       | SE & FSE              | 67     | 453.61         | 19.75   |
|                       | SSG & NSG             | 14     | 503.70         | 82.35   |
|                       | WC & LEP              | 13     | 291.15         | 26.25   |

# Appendix 7. Estimating ABS Benchmark totals for 2021

| SA4   | Name                         | Popn        | Sample   | Initial |
|-------|------------------------------|-------------|----------|---------|
|       |                              | (2020 est.) | Fraction | Sample  |
| 401   | Adelaide - Central and Hills | 123,948     | 0.035    | 4,374   |
| 402   | Adelaide - North             | 172,486     | 0.035    | 6,094   |
| 403   | Adelaide - South             | 153,195     | 0.035    | 5,414   |
| 404   | Adelaide - West              | 101,442     | 0.035    | 3,582   |
| 405   | Barossa - Yorke - Mid North  | 50,128      | 0.062    | 3,090   |
| 406   | SA - Outback                 | 35,509      | 0.062    | 2,188   |
| 407   | SA - South East              | 83,176      | 0.062    | 5,118   |
| TOTAL |                              | 719,885     |          | 29,860  |

| Appendix 8. South   | Australian private | dwelling population | (number of households | s), survey sam | mple size, and | responses to the | screening survey |
|---------------------|--------------------|---------------------|-----------------------|----------------|----------------|------------------|------------------|
| by stratum (net sam | ple-initial sample | less sample loss).  |                       |                |                |                  |                  |

| Statistical Area Level<br>4 Name | Popn (ABS<br>Census<br>2021) | Initial<br>Sample | Net<br>Sample | Fully<br>Responding | Uninformed<br>Refusals | Informed<br>Refusals | Full Non-<br>contact | Other<br>non-<br>response | Response% |
|----------------------------------|------------------------------|-------------------|---------------|---------------------|------------------------|----------------------|----------------------|---------------------------|-----------|
| Adelaide - Central<br>and Hills  | 122,507                      | 4,374             | 4,037         | 778                 | 609                    | 328                  | 2,284                | 38                        | 19%       |
| Adelaide - North                 | 167,280                      | 6,094             | 5,615         | 855                 | 853                    | 516                  | 3,331                | 60                        | 15%       |
| Adelaide - South                 | 147,512                      | 5,414             | 4,986         | 901                 | 719                    | 463                  | 2,871                | 32                        | 18%       |
| Adelaide - West                  | 98,750                       | 3,582             | 3,302         | 570                 | 484                    | 315                  | 1,880                | 53                        | 17%       |
| Barossa - Yorke - Mid<br>North   | 46,018                       | 3,090             | 2,911         | 597                 | 415                    | 244                  | 1,647                | 8                         | 21%       |
| South Australia -<br>Outback     | 31,665                       | 2,188             | 2,046         | 357                 | 299                    | 138                  | 1,237                | 15                        | 17%       |
| South Australia -<br>South-East  | 77,577                       | 5,118             | 4,797         | 867                 | 700                    | 421                  | 2,784                | 25                        | 18%       |
| Total                            | 691,309                      | 29,860            | 27,694        | 4,925               | 4,079                  | 2,425                | 16,034               | 231                       | 18%       |

Appendix 9. Diary survey response profile by stratum.

| Statistical Area Level 4     | Eligible households | Completed diary | Response (%) |
|------------------------------|---------------------|-----------------|--------------|
| Adelaide - Central and Hills | 213                 | 130             | 61%          |
| Adelaide - North             | 216                 | 139             | 64%          |
| Adelaide - South             | 256                 | 159             | 62%          |
| Adelaide - West              | 159                 | 93              | 58%          |
| Barossa - Yorke - Mid North  | 240                 | 161             | 67%          |
| South Australia - Outback    | 167                 | 113             | 68%          |
| South Australia – South-East | 327                 | 224             | 69%          |
| Total                        | 1,578               | 1,019           | 65%          |

| Statistical Area<br>Level 4     | Non-<br>intending | Initial<br>Sample | Net<br>Sample | Fully<br>Responding | Refusal | Non-<br>contact | Response<br>(%) |
|---------------------------------|-------------------|-------------------|---------------|---------------------|---------|-----------------|-----------------|
| Adelaide - Central              | 571               | 199               | 192           | 114                 | 16      | 62              | 59%             |
| Adelaide - North                | 629               | 222               | 207           | 139                 | 14      | 54              | 67%             |
| Adelaide - South                | 654               | 230               | 213           | 144                 | 15      | 54              | 68%             |
| Adelaide - West                 | 412               | 147               | 137           | 91                  | 8       | 38              | 66%             |
| Barossa - Yorke -<br>Mid North  | 369               | 134               | 121           | 74                  | 9       | 38              | 61%             |
| South Australia -<br>Outback    | 176               | 67                | 61            | 45                  | 4       | 12              | 74%             |
| South Australia –<br>South-East | 536               | 186               | 173           | 108                 | 12      | 53              | 62%             |
| Total                           | 3,347             | 1,185             | 1,104         | 715                 | 78      | 311             | 65%             |

**Appendix 10.** Response profile (household) to the non-intending fisher call-back survey by stratum.

**Appendix 11.** Estimated number of persons and proportion of the South Australian resident population aged five years or older by age and statistical division who fished recreationally in South Australia during the 12 months prior to March 2021.

| Statistical Area                | Age class  | Population   | Fishers   | SE   | % Fishers                        |
|---------------------------------|--|--|---|--|----------------------------------|
| Adelaide - Central<br>and Hills | 5 to 14<br>15 to 29<br>30 to 44<br>45 to 59<br>60 to 74<br>75+ | 32,866<br>57,240<br>56,500<br>55,800<br>48,649<br>27,337 | 10,590<br>14,572<br>13,429<br>13,681<br>6,565<br>731    | 1,517<br>2,093<br>1,904<br>1,591<br>1,226<br>371 | 32<br>25<br>24<br>25<br>13<br>3  |
| Adelaide - North                | 5 to 14<br>15 to 29<br>30 to 44<br>45 to 59<br>60 to 74<br>75+ | 56,537<br>86,165<br>91,498<br>78,209<br>61,808<br>30,772 | 18,205<br>13,529<br>17,140<br>20,519<br>10,712<br>1,734 | 2,344<br>2,146<br>2,430<br>2,369<br>1,768<br>718 | 32<br>16<br>19<br>26<br>17<br>6  |
| Adelaide - South                | 5 to 14<br>15 to 29<br>30 to 44<br>45 to 59<br>60+<br>75+      | 41,267<br>62,587<br>68,978<br>67,850<br>63,065<br>32,238 | 13,892<br>11,229<br>17,542<br>15,143<br>10,056<br>1,039 | 1,698<br>1,526<br>1,911<br>1,734<br>1,342<br>441 | 34<br>18<br>25<br>22<br>16<br>3  |
| Adelaide - West                 | 5 to 14<br>15 to 29<br>30 to 44<br>45 to 59<br>60 to 74<br>75+ | 23,011<br>45,292<br>48,801<br>44,449<br>37,135<br>20,804 | 3,789<br>7,941<br>7,338<br>7,720<br>6,968<br>1,387      | 881<br>1,592<br>1,383<br>1,441<br>1,379<br>556   | 16<br>18<br>15<br>17<br>19<br>7  |
| Barossa –Yorke -<br>Mid North   | 5 to 14<br>15 to 29<br>30 to 44<br>45 to 59<br>60 to 74<br>75+ | 12,292<br>14,636<br>15,708<br>20,810<br>24,116<br>11,565 | 5,416<br>3,588<br>6,376<br>6,728<br>7,684<br>664        | 732<br>616<br>734<br>725<br>744<br>221           | 44<br>25<br>41<br>32<br>32<br>6  |
| South Australia -<br>Outback    | 5 to 14<br>15 to 29<br>30 to 44<br>45 to 59<br>60 to 74<br>75+ | 9,287<br>12,425<br>13,326<br>14,546<br>12,876<br>5,916   | 4,759<br>4,595<br>7,639<br>6,882<br>5,415<br>1,644      | 558<br>709<br>684<br>707<br>558<br>414           | 51<br>37<br>57<br>47<br>42<br>28 |
| South Australia –<br>South East | 5 to 14<br>15 to 29<br>30 to 44<br>45 to 59<br>60 to 74<br>75+ | 19,647<br>25,608<br>27,016<br>34,094<br>39,795<br>20,385 | 7,623<br>8,198<br>11,127<br>11,647<br>9,518<br>1,755    | 991<br>1,048<br>1,196<br>1,212<br>896<br>375     | 39<br>32<br>41<br>34<br>24<br>9  |

**Appendix 12.** Annual recreational effort (fisher days and numbers of fishers) and catch (retained and released, by number) of key species by water body type during 2021–22 based on South Australian residents aged five years or older. SE is standard error; + indicates value <1000; values in bold indicate relative standard error >40%, values in italics indicate that fewer than 30 households recorded catches of the species/species group.

|  | Insho     | ore    | Offsh  | ore    | Estua  | ary    |
|--|-----------|--------|--------|--------|--------|--------|
| -  | Number    | SE     | Number | SE     | Number | SE     |
| Effort   |           |        |        |        |        |        |
| Number of fishers                                      | 241,232   | 11,752 | 20,348 | 3,413  | 26,959 | 4,299  |
| Fisher days  | 1,000,898 | 84,715 | 51,607 | 8,813  | 43,260 | 8,151  |
| Catch (Marine Finfish)                                 |           |        |        |        |        |        |
| Bream, Black   | 8,604     | 3,890  |        |        | 22,273 | 6,366  |
| Flathead   | 43,812    | 10,663 | 7,897  | 6,906  | 2,159  | 2,088  |
| Flounder   | 5,347     | 3,058  | +      |        |        |        |
| Garfish, Southern                                      | 303,942   | 61,874 | 22,168 | 9,173  | 2,098  | 2,175  |
| Herring, Australian                                    | 628,213   | 94,058 | 16,388 | 5,274  | 3,588  | 2,347  |
| Kingfish, Yellowtail                                   | 1,681     | 1,102  | 2,604  | 1,721  |        |        |
| Leatherjacket  | 71,204    | 13,276 | 8,856  | 3,522  | +      |        |
| Mackerel, Blue Slimy                                   | 27,186    | 15,457 | 4,105  | 2,964  |        |        |
| Mullet, Red (goatfish)                                 | 42,858    | 13,366 | 5,056  | 2,190  |        |        |
| Mullet, Sea  | 14,633    | 6,508  |        |        | +      |        |
| Mullet, Yelloweye                                      | 63,226    | 20,933 |        |        | 6,431  | 5,484  |
| Mulloway   | 3,603     | 1,237  | +      |        | +      |        |
| Perch, Striped (Western Striped Grunter)               | 231,225   | 53,476 | 14,143 | 6,381  | 1,118  | 885    |
| Redfish, Bight (Nannygai, Red Snapper,<br>Swallowtail) | 6,463     | 2,844  | 31,610 | 10,911 |        |        |
| Salmon, Western Australian                             | 230,842   | 40,268 | 4,692  | 1,964  | 44,535 | 21,113 |

# Appendix 12. Continued.

|                              | Inst      | nore     | Offs    | hore   | Estuary |        |
|------------------------------|-----------|----------|---------|--------|---------|--------|
|                              | Number    | SE       | Number  | SE     | Number  | SE     |
| Snapper                      | 51,959    | 12,487   | 7,063   | 2,153  | +       |        |
| Snook                        | 33,827    | 11,385   | 2,487   | 1,170  | +       |        |
| Sweep                        | 29,632    | 9,702    | 3,049   | 1,513  |         |        |
| Toadfish                     | 92,027    | 28,390   | 2,317   | 1,243  | +       |        |
| Trevally, Silver             | 21,440    | 6,846    | 16,319  | 12,846 |         |        |
| Tuna, Southern Bluefin       | +         |          | 3,268   | 1,634  |         |        |
| Whiting, King George         | 1,651,947 | 242,626  | 176,865 | 34,560 | 5,680   | 2,859  |
| Catch (Marine Invertebrates) |           |          |         |        |         |        |
| Calamari, Southern           | 548,964   | 70,450   | 23,445  | 6,874  | 1,399   | 1,551  |
| Cockle, Mud                  | 117,777   | 69,924   |         |        |         |        |
| Crab, Blue Swimmer           | 1,892,830 | 337,223  | 23,953  | 9,608  | 46,558  | 28,269 |
| Crab, Sand                   | 18,899    | 5,770    | +       |        |         |        |
| Cuttlefish                   | 7,761     | 2,931    | +       |        |         |        |
| Pipi                         | 1,704,036 | 724,350  |         |        |         |        |
| Razorfish                    | 76,156    | 51,939   | 19,005  | 6,519  |         |        |
| Rock Lobster, Southern       | 117,463   | 35,824   | 8,674   | 5,549  |         |        |
| Scallop                      | 20,244    | 11,137   |         |        |         |        |
|                              | Freshwate | er River | Lake/D  | am     |         |        |
|                              | Number    | SE       | Number  | SE     |         |        |
| Effort                       |           |          |         |        |         |        |
| Fishers                      | 61,981    | 7,324    | 17,012  | 3,677  |         |        |
| Fisher days                  | 183,935   | 30,271   | 32,970  | 8,238  |         |        |
| Catch (Freshwater Species)   |           |          |         |        |         |        |
| Carp                         | 132,379   | 25,699   | 17,132  | 6,481  |         |        |
| Shrimp, Freshwater           | 281,608   | 126,640  |         |        |         |        |
| Perch, golden (callop)       | 21,356    | 7,209    | 2,864   | 2,062  |         |        |
| Perch, Redfin                | 3,925     | 1,792    | 38,909  | 17,750 |         |        |
| Yabby, Freshwater            | 886,893   | 340,355  | 60,012  | 28,919 |         |        |

**Appendix 13.** Annual recreational effort (fishers and fisher days) and catch (retained and released, by number) of key species by fishing method during 2021–22, based on South Australian residents aged five years or older. SE is standard error; + indicates value <1000, values in bold indicate relative standard error >40%, values in red italics indicate that fewer than 30 households recorded catches.

|   | Lin       | e       | Crab      | net     |
|---|-----------|---------|-----------|---------|
|   | Number    | SE      | Number    | SE      |
| Effort  |           |         |           |         |
| Fishers   | 270,590   | 12,109  | 75,424    | 7,615   |
| Fisher days   | 1,092,805 | 82,094  | 154,635   | 18,206  |
| Catch (Marine Finfish)                              |           |         |           |         |
| Bream, Black  | 30,191    | 7,835   |           |         |
| Flathead  | 52,702    | 12,842  | 1,122     | 706     |
| Flounder  | 5,310     | 3,059   |           |         |
| Garfish, Southern                                   | 302,858   | 62,285  | +         |         |
| Herring, Australian                                 | 647,886   | 94,725  |           |         |
| Kingfish, Yellowtail                                | 4,285     | 2,043   |           |         |
| Leatherjacket                                       | 76,794    | 13,631  | 3,861     | 3,050   |
| Mackerel, Blue Slimy                                | 31,291    | 15,730  |           |         |
| Mullet, Red (goatfish)                              | 47,914    | 13,711  |           |         |
| Mullet, Sea   | 12,636    | 6,209   |           |         |
| Mullet, Yelloweye                                   | 64,042    | 20,950  |           |         |
| Mulloway  | 3,720     | 1,243   |           |         |
| Perch, Striped (Western Striped Grunter)            | 246,206   | 56,965  | +         |         |
| Redfish, Bight (Nannygai, Red Snapper, Swallowtail) | 38,073    | 11,431  |           |         |
| Salmon. Western Australian                          | 279.505   | 46.189  | +         |         |
| Snapper   | 59,129    | 13.038  |           |         |
| Snook   | 36,806    | 11.459  |           |         |
| Sweep   | 32,388    | 9.846   |           |         |
| Toadfish  | 93,778    | 28.502  | +         |         |
| Trevally, Silver                                    | 37,760    | 14.635  |           |         |
| Tuna. Southern Bluefin                              | 4.197     | 1.697   |           |         |
| Whiting, King George                                | 1.830.071 | 251.617 | 4.178     | 3,903   |
| Catch (Marine Invertebrates)                        | , , -     | - ,-    | , -       |         |
| Calamari, Southern                                  | 572,301   | 71,685  | +         |         |
| Cockle, Mud   | - ,       | ,       |           |         |
| Crab, Blue Swimmer                                  | 31,791    | 7,545   | 1,463,796 | 264,408 |
| Crab, Sand  | 3,874     | 1,358   | 13,311    | 5,309   |
| Cuttlefish  | 7,808     | 2,935   |           |         |
| Pipi  |           |         |           |         |
| Razorfish   |           |         |           |         |
| Rock Lobster, Southern                              |           |         | +         |         |
| Scallop   |           |         |           |         |
| Catch (Freshwater)                                  |           |         |           |         |
| Carp  | 147,717   | 26,986  |           |         |
| Perch, golden (callop)                              | 24,220    | 7,498   |           |         |
| Perch, Redfin                                       | 42,489    | 18,097  |           |         |
| Shrimp, Freshwater                                  | +         | -       |           |         |
| Yabby, Freshwater                                   |           |         |           |         |

#### Appendix 13. Continued.

|                              | Lobste  | er pot | Spear/ | Dive   | Hand      |         |
|------------------------------|---------|--------|--------|--------|-----------|---------|
|                              | Number  | SE     | Number | SE     | Number    | SE      |
| Effort                       |         |        |        |        |           |         |
| Fishers                      | 6,701   | 1,757  | 5,891  | 1,435  | 32,510    | 5,491   |
| Fisher days                  | 82,976  | 24,754 | 14,704 | 6,964  | 55,931    | 10,534  |
| Catch (Marine Finfish)       |         |        |        |        |           |         |
| Bream, Black                 |         |        | +      |        |           |         |
| Flathead                     |         |        | +      |        |           |         |
| Flounder                     |         |        |        |        |           |         |
| Garfish, Southern            |         |        |        |        |           |         |
| Herring, Australian          |         |        |        |        |           |         |
| Kingfish, Yellowtail         |         |        |        |        |           |         |
| Leatherjacket                |         |        |        |        |           |         |
| Mackerel, Blue Slimy         |         |        |        |        |           |         |
| Mullet, Red (goatfish)       |         |        |        |        |           |         |
| Mullet, Sea                  |         |        |        |        |           |         |
| Mullet, Yelloweye            |         |        |        |        |           |         |
| Mulloway                     |         |        |        |        |           |         |
| Perch. Striped (Western      |         |        |        |        |           |         |
| Striped Grunter)             |         |        |        |        |           |         |
| Podfich Bight (Nannygai Pod  |         |        |        |        |           |         |
| Spapper Swallowtail)         |         |        |        |        |           |         |
| Shapper, Swallowtail)        |         |        |        |        |           |         |
| Salmon, Western Australian   |         |        | +      |        |           |         |
| Snapper                      |         |        |        |        |           |         |
| Shook                        |         |        |        |        |           |         |
| Sweep                        |         |        | +      |        |           |         |
|                              |         |        |        |        |           |         |
| Trevally, Silver             |         |        |        |        |           |         |
| Tuna, Southern Bluefin       |         |        |        |        |           |         |
| Whiting, King George         |         |        |        |        |           |         |
| Catch (Marine Invertebrates) |         |        |        |        |           |         |
| Calamari, Southern           |         |        |        |        |           |         |
| Cockle, Mud                  |         |        |        |        | 117,777   | 69,924  |
| Crab, Blue Swimmer           | 1,325   | 1,262  | 58,103 | 43,558 | 243,601   | 50,682  |
| Crab, Sand                   |         |        |        |        | 1,818     | 1,670   |
| Cuttlefish                   |         |        |        |        |           |         |
| Pipi                         |         |        |        |        | 1,621,949 | 720,119 |
| Razorfish                    |         |        |        |        | 74,944    | 51,913  |
| Rock Lobster, Southern       | 121,368 | 36,636 | 3,946  | 3,037  |           |         |
| Scallop                      |         |        | 19,666 | 11,122 |           |         |
| Catch (Freshwater)           |         |        |        |        |           |         |
| Carp                         |         |        |        |        |           |         |
| Perch, golden (callop)       |         |        |        |        |           |         |
| Perch, Redfin                |         |        |        |        |           |         |
| Shrimp, Freshwater           |         |        |        |        | 1,907     | 1,836   |
| Yabby, Freshwater            |         |        |        |        | 49.358    | 34.232  |

**Appendix 14.** Annual recreational effort (number of fishers and fisher days) and catch (retained and released, by number) for key species by fishing region during 2021–22, based on South Australian residents aged five years or older. SE is standard error; + indicates value <1000; values in bold indicate relative standard error >40%, values in italics indicate that fewer than 30 households recorded catches of the species/ group. SSG (Southern Spencer Gulf), NSG (Northern Spencer Gulf), GSVKI (Gulf St. Vincent / Kangaroo Island), NGSV (Northern Gulf St. Vincent), SE (South-East) and FSE (Far South-East), LEP (Lower Eyre Peninsula), WC (West Coast).

|                                 | WC      |         | LE      | Ρ      | SS      | G      | NS      | G       |
|---------------------------------|---------|---------|---------|--------|---------|--------|---------|---------|
|                                 | Number  | SE      | Number  | SE     | Number  | SE     | Number  | SE      |
| Effort                          |         |         |         |        |         |        |         |         |
| Fishers                         | 27,684  | 4,402   | 15,914  | 3,134  | 62,445  | 6,251  | 45,632  | 5,283   |
| Fisher days                     | 105,602 | 21,465  | 37,682  | 8,922  | 178,502 | 22,775 | 139,399 | 21,312  |
| Catch (Marine Finfish)          |         |         |         |        |         |        |         |         |
| Bream, Black                    |         |         |         |        | +       |        |         |         |
| Flathead                        | 7,582   | 2,860   | 7,272   | 2,721  | 1,868   | 639    | 5,768   | 2,072   |
| Flounder                        |         |         | +       |        |         |        | 2,339   | 1,900   |
| Garfish, Southern               | 11,106  | 7,854   | 9,144   | 7,971  | 105,230 | 32,676 | 36,432  | 11,927  |
| Herring, Australian             | 125,708 | 49,613  | 32,656  | 14,517 | 101,716 | 23,987 | 76,841  | 25,775  |
| Kingfish, Yellowtail            |         |         |         |        |         |        | 1,681   | 1,102   |
| Leatherjacket                   | 6,956   | 3,428   | +       |        | 15,435  | 4,904  | 14,768  | 7,873   |
| Mackerel, Blue Slimy            |         |         |         |        | 3,864   | 2,759  | +       |         |
| Mullet, Red (goatfish)          | 15,382  | 11,108  | +       |        | 14,445  | 5,093  | +       |         |
| Mullet, Sea                     |         |         |         |        |         |        |         |         |
| Mullet, Yelloweye               | 4,620   | 2,670   | 1,168   | 911    | 2,800   | 1,385  | 1,860   | 1,187   |
| Mulloway                        | 1,813   | 867     |         |        |         |        |         |         |
| Perch, Striped (Western Striped | 47,301  | 24,395  | +       |        | 36,106  | 19,303 | 87,594  | 45,481  |
| Redfish Bight (Nannygai Red     | 2 132   | 2 150   | 13 101  | 7 /80  | 1 301   | 878    | 1 775   | 1 603   |
| Snapper, Swallowtail)           | 2,452   | 2,100   | 13,104  | 7,405  | 1,004   | 070    | 1,110   | 1,000   |
| Salmon, Western Australian      | 44,731  | 13,953  | 15,713  | 5,913  | 22,036  | 6,284  | 24,219  | 8,597   |
| Snapper                         |         |         | +       |        | 21,044  | 7,491  | 16,792  | 6,337   |
| Snook                           | 1,212   | 677     | +       |        | 10,018  | 3,885  | 1,968   | 1,329   |
| Sweep                           | +       |         | 1,443   | 794    | 6,334   | 5,474  | 2,568   | 2,051   |
| Toadfish                        |         |         | +       |        | 18,751  | 9,889  | 53,652  | 25,828  |
| Trevally, Silver                | 7,301   | 4,579   | +       |        | 3,089   | 1,509  | 2,137   | 2,081   |
| Tuna, Southern Bluefin          | +       |         | 1,612   | 1,332  |         |        |         |         |
| Whiting, King George            | 384,431 | 117,111 | 130,664 | 44,605 | 459,621 | 98,756 | 346,070 | 105,661 |

## Appendix 14. Continued.

|  | GSVKI   |        | NGSV    |        | SE     |       | FS      | FSE   |  |
|--|---------|--------|---------|--------|--------|-------|---------|-------|--|
|  | Number  | SE     | Numbe   | SE     | Numbe  | SE    | Numbe   | SE    |  |
| Effort   |         |        |         |        |        |       |         |       |  |
| Fishers  | 86,969  | 7,584  | 65,786  | 6,959  | 37,358 | 5,917 | 26,977  | 3,527 |  |
| Fisher days  | 262,740 | 43,782 | 177,002 | 26,445 | 63,441 | 9,484 | 122,422 | 27,18 |  |
| Catch (Marine Finfish)                                 |         |        |         |        |        |       |         |       |  |
| Bream, Black   | 8,754   | 2,653  | 12,052  | 5,299  | 7,559  | 4,961 | 2,296   | 2,110 |  |
| Flathead   | 7,210   | 2,987  | 11,433  | 8,836  | 3,073  | 2,100 | 9,664   | 7,030 |  |
| Flounder   | +       |        | +       |        | 2,414  | 2,375 | +       |       |  |
| Garfish, Southern                                      | 107,671 | 45,790 | 27,969  | 10,223 | 5,380  | 2,762 | 25,275  | 19,32 |  |
| Herring, Australian                                    | 193,655 | 51,725 | 75,153  | 31,556 | 26,829 | 13,03 | 14,092  | 8,827 |  |
| Kingfish, Yellowtail                                   | +       |        |         |        | 2,092  | 1,690 | +       |       |  |
| Leatherjacket  | 25,873  | 7,942  | 16,019  | 6,394  | +      |       | +       |       |  |
| Mackerel, Blue Slimy                                   | 3,510   | 1,977  | 20,230  | 15,101 | 3,643  | 2,871 |         |       |  |
| Mullet, Red (goatfish)                                 | 5,123   | 2,307  | 11,062  | 5,618  | +      |       | +       |       |  |
| Mullet, Sea  | 2,396   | 2,026  | 3,332   | 2,349  | 3,341  | 2,848 | 5,603   | 4,980 |  |
| Mullet, Yelloweye                                      | 38,874  | 19,174 | +       |        | 7,708  | 3,786 | 11,910  | 6,781 |  |
| Mulloway   | +       |        | +       |        | +      |       | +       |       |  |
| Perch, Striped (Western Striped Grunter)               | 20,419  | 15,094 | 53,803  | 20,270 |        |       | +       |       |  |
| Redfish, Bight (Nannygai, Red Snapper,<br>Swallowtail) | 11,252  | 7,034  | +       |        | 4,238  | 2,596 | 3,898   | 3,694 |  |
| Salmon, Western Australian                             | 79,494  | 30,063 | 30,502  | 13,355 | 31,091 | 15,66 | 11,579  | 4,510 |  |
| Snapper  | 6,524   | 4,103  | 7,063   | 5,302  | +      |       | 7,376   | 5,296 |  |
| Snook  | 19,409  | 9,898  | +       |        | +      |       | 2,448   | 2,417 |  |
| Sweep  | 14,480  | 7,463  | +       |        | 3,432  | 1,705 | 3,272   | 1,632 |  |
| Toadfish   | 5,462   | 2,232  | 10,607  | 5,224  | 1,233  | 579   | 4,551   | 2,251 |  |
| Trevally, Silver                                       | 6,133   | 4,036  | +       |        | 15,897 | 12,84 | 2,590   | 1,572 |  |
| Tuna, Southern Bluefin                                 | +       |        |         |        | 1,522  | 939   | +       |       |  |
| Whiting, King George                                   | 213,083 | 50,919 | 263,476 | 157,58 | 8,236  | 4,279 | 28,912  | 8,896 |  |

### Appendix 14. Continued.

|  | WC   |   | LE   | Р   | SS  | 3  | NSG  |   |
|--|--|---|--|---|---|--|--|---|
|  | Number   | SE  | Number   | SE  | Number  | SE   | Number   | SE  |
| Catch (Marine Invertebrates)   |  |   |  |   |   |  |  |   |
| Calamari, Southern   | 25,205   | 8,162   | 4,129  | 2,571   | 165,617   | 31,552   | 130,563  | 35,306  |
| Cockle, Mud  |  |   | 16,501   | 35,707  |   |  |  |   |
| Crab, Blue Swimmer   | 64,751   | 44,737  | +  |   | 117,091   | 39,652   | 555,948  | 202,962                                       |
| Crab, Sand   | 5,426  | 4,677   |  |   | 1,151   | 811  | +  |   |
| Cuttlefish   | +  |   |  |   | 1,484   | 685  | 4,462  | 2,680   |
| Pipi   | 72,752   | 53,944  | 3,961  | 3,813   |   |  |  |   |
| Razorfish  | 82,106   | 52,015  | 2,702  | 2,725   |   |  |  |   |
| Rock Lobster, Southern   | +  |   | 2,270  | 2,289   |   |  |  |   |
| Scallop  | +  |   | 1,405  | 1,417   |   |  | 9,897  | 9,718   |
|  |  |   |  |   |   |  |  |   |
|  | GSV  | ΊKΙ   | NG   | SV  | SE  |  | FS   | E   |
|  | GSV<br>Number  | KI<br>SE  | NG:<br>Number  | SV<br>SE  | SE<br>Number  | E<br>SE  | FS<br>Number   | ie<br>Se                                      |
| Catch (Marine Invertebrates)   | GSV<br>Number  | KI<br>SE  | NG:<br>Number  | SV<br>SE  | SE<br>Number  | E<br>SE  | FS<br>Number   | SE<br>SE                                      |
| Catch (Marine Invertebrates)<br>Calamari, Southern   | GSV<br>Number<br>143,916                                       | KI<br>SE<br>41,229                                    | NG<br>Number<br>89,951   | SV<br>SE<br>25,562  | SE<br>Number<br>2,422   | SE<br>1,446                                    | FS<br>Number<br>12,005   | SE<br>SE<br>3,710                             |
| Catch (Marine Invertebrates)<br>Calamari, Southern<br>Cockle, Mud  | GSV<br>Number<br>143,916                                       | KI<br>SE<br>41,229                                    | NG8<br>Number<br>89,951<br><b>101,277</b>                        | SV<br>SE<br>25,562<br>60,120                              | SE<br>Number<br>2,422   | SE<br>1,446                                    | FS<br>Number<br>12,005   | SE<br>SE<br>3,710                             |
| Catch (Marine Invertebrates)<br>Calamari, Southern<br>Cockle, Mud<br>Crab, Blue Swimmer  | GSV<br>Number<br>143,916<br>209,218                            | KI<br>SE<br>41,229<br>68,496                          | NG<br>Number<br>89,951<br>101,277<br>995,665                     | SV<br>SE<br>25,562<br>60,120<br>263,245                   | SE<br>Number<br>2,422<br>16,672                                     | SE<br>1,446<br>10,748                          | FS<br>Number<br>12,005<br>2,418                                | SE<br>SE<br>3,710<br><b>1,670</b>             |
| Catch (Marine Invertebrates)<br>Calamari, Southern<br>Cockle, Mud<br>Crab, Blue Swimmer<br>Crab, Sand  | GSV<br>Number<br>143,916<br>209,218<br>3,068                   | KI<br>SE<br>41,229<br>68,496<br><b>1,516</b>          | NG3<br>Number<br>89,951<br>101,277<br>995,665<br>6,603           | SV<br>SE<br>25,562<br>60,120<br>263,245<br>2,624          | SE<br>Number<br>2,422<br>16,672<br>1,346                            | SE<br>1,446<br>10,748<br>869                   | FS<br>Number<br>12,005<br>2,418<br>+                           | SE<br>SE<br>3,710<br>1,670                    |
| Catch (Marine Invertebrates)<br>Calamari, Southern<br>Cockle, Mud<br>Crab, Blue Swimmer<br>Crab, Sand<br>Cuttlefish  | GSV<br>Number<br>143,916<br>209,218<br>3,068<br>1,267          | KI<br>SE<br>41,229<br>68,496<br>1,516<br>839          | NG<br>Number<br>89,951<br><b>101,277</b><br>995,665<br>6,603     | SV<br>SE<br>25,562<br>60,120<br>263,245<br>2,624          | SE<br>Number<br>2,422<br>16,672<br>1,346<br>+                       | SE<br>1,446<br>10,748<br>869                   | FS<br>Number<br>12,005<br>2,418<br>+<br>+                      | SE<br>SE<br>3,710<br><b>1,670</b>             |
| Catch (Marine Invertebrates)<br>Calamari, Southern<br>Cockle, Mud<br>Crab, Blue Swimmer<br>Crab, Sand<br>Cuttlefish<br>Pipi  | GSV<br>Number<br>143,916<br>209,218<br>3,068<br>1,267          | KI<br>SE<br>41,229<br>68,496<br>1,516<br>839          | NG3<br>Number<br>89,951<br><b>101,277</b><br>995,665<br>6,603    | SV<br>SE<br>25,562<br>60,120<br>263,245<br>2,624          | SE<br>Number<br>2,422<br>16,672<br>1,346<br>+<br>1,588,712          | SE<br>1,446<br>10,748<br>869<br>721,712        | FS<br>Number<br>12,005<br>2,418<br>+<br>+<br>38,612            | SE<br>SE<br>3,710<br>1,670<br>29,257          |
| Catch (Marine Invertebrates)<br>Calamari, Southern<br>Cockle, Mud<br>Crab, Blue Swimmer<br>Crab, Sand<br>Cuttlefish<br>Pipi<br>Razorfish                           | GSV<br>Number<br>143,916<br>209,218<br>3,068<br>1,267          | KI<br>SE<br>41,229<br>68,496<br><b>1,516</b><br>839   | NG3<br>Number<br>89,951<br>101,277<br>995,665<br>6,603<br>10,353 | SV<br>SE<br>25,562<br>60,120<br>263,245<br>2,624<br>7,667 | SE<br>Number<br>2,422<br>16,672<br>1,346<br>+<br>1,588,712          | SE<br>1,446<br>10,748<br>869<br>721,712        | FS<br>Number<br>12,005<br>2,418<br>+<br>+<br>38,612            | SE<br>SE<br>3,710<br>1,670<br>29,257          |
| Catch (Marine Invertebrates)<br>Calamari, Southern<br>Cockle, Mud<br>Crab, Blue Swimmer<br>Crab, Sand<br>Cuttlefish<br>Pipi<br>Razorfish<br>Rock Lobster, Southern | GSV<br>Number<br>143,916<br>209,218<br>3,068<br>1,267<br>2,794 | KI<br>SE<br>41,229<br>68,496<br>1,516<br>839<br>2,746 | NG<br>Number<br>89,951<br>101,277<br>995,665<br>6,603<br>10,353  | SV<br>SE<br>25,562<br>60,120<br>263,245<br>2,624<br>7,667 | SE<br>Number<br>2,422<br>16,672<br>1,346<br>+<br>1,588,712<br>1,018 | SE<br>1,446<br>10,748<br>869<br>721,712<br>957 | FS<br>Number<br>12,005<br>2,418<br>+<br>+<br>38,612<br>119,255 | E<br>SE<br>3,710<br>1,670<br>29,257<br>36,506 |

### Appendix 14. Continued.

|   | Coor  | ong  | Lal   | Lakes                                    |  | J.   |
|---|---|--|---|--|--|--|
|   | Number  | SE   | Number  | SE                                       | Number   | SE   |
| Effort  |   |  |   |  |  |  |
| Fishers   | 3,103   | 1,289  | 1,509   | 1,179                                    | 14,891   | 4,456  |
| Fisher days   | 8,310   | 4,955  | 5,075   | 4,575                                    | 22,811   | 6,704  |
| Catch (Marine Finfish)  |   |  |   |  |  |  |
| Herring, Australian   | 1,540   | 1,123  |   |  |  |  |
| Mullet, Yelloweye   | +   |  |   |  |  |  |
| Mulloway  | +   |  |   |  |  |  |
| Salmon, Australian  | 20,704  | 18,279   |   |  |  |  |
| Toadfish  | +   |  |   |  |  |  |
| Catch (Freshwater)  |   |  |   |  |  |  |
| Carp  | +   |  | 2,139   | 1,747                                    | 27,014   | 8,071  |
| Perch, golden (callop)  | +   |  |   |  | 2,295  | 1,252  |
| Perch, Redfin   |   |  |   |  | +  |  |
| Shrimp, Freshwater  |   |  |   |  | 20,634   | 14,223   |
| Yabby, Freshwater   |   |  |   |  | 70,296   | 55,745   |
|   |   |  |   |  |  |  |
|   | Mid N   | lu.  | Upper   | r Mu.                                    | Inland   |  |
| -   | Mid N<br>Number   | lu.<br>SE  | Upper<br>Number   | r Mu.<br>SE                              | Inland<br>Number   | SE   |
| -<br>Effort   | Mid N<br>Number   | lu.<br>SE  | Upper<br>Number   | r Mu.<br>SE                              | Inland<br>Number   | SE   |
| Effort<br>Fishers   | Mid M<br>Number<br>30,825   | 1u.<br>SE<br>5,180                                   | Upper<br>Number<br>14,819   | 7 Mu.<br>SE<br>3,060                     | Inland<br>Number<br>19,389   | <b>SE</b><br>3,651                               |
| Effort<br>Fishers<br>Fisher days  | Mid N<br>Number<br>30,825<br>93,263   | 1u.<br>SE<br>5,180<br>23,290                         | Upper<br>Number<br>14,819<br>59,017                                   | <b>Mu.</b><br>SE<br>3,060<br>16,865      | Inland   Number   19,389   35,627                                      | <b>SE</b><br>3,651<br>7,767                      |
| Effort<br>Fishers<br>Fisher days<br>Catch (Marine Finfish)  | Mid N<br>Number<br>30,825<br>93,263   | lu.<br>SE<br>5,180<br>23,290                         | Upper<br>Number<br>14,819<br>59,017                                   | <b>Mu.</b><br>SE<br>3,060<br>16,865      | Inland   Number   19,389   35,627                                      | <b>SE</b><br>3,651<br>7,767                      |
| Effort<br>Fishers<br>Fisher days<br>Catch (Marine Finfish)<br>Herring, Australian   | Mid N<br>Number<br>30,825<br>93,263   | lu.<br>SE<br>5,180<br>23,290                         | Upper<br>Number<br>14,819<br>59,017                                   | <b>Mu.</b><br>SE<br>3,060<br>16,865      | Inland   Number   19,389   35,627                                      | <b>SE</b><br>3,651<br>7,767                      |
| Effort<br>Fishers<br>Fisher days<br>Catch (Marine Finfish)<br>Herring, Australian<br>Mullet, Yelloweye  | Mid N<br>Number<br>30,825<br>93,263   | lu.<br>SE<br>5,180<br>23,290                         | Upper<br>Number<br>14,819<br>59,017                                   | 7 Mu.<br>SE<br>3,060<br>16,865           | Inland<br>Number<br>19,389<br>35,627                                   | <b>SE</b><br>3,651<br>7,767                      |
| Effort<br>Fishers<br>Fisher days<br>Catch (Marine Finfish)<br>Herring, Australian<br>Mullet, Yelloweye<br>Mulloway  | Mid N<br>Number<br>30,825<br>93,263   | 1u.<br>SE<br>5,180<br>23,290                         | Upper<br>Number<br>14,819<br>59,017                                   | r Mu.<br>SE<br>3,060<br>16,865           | Inland   Number   19,389   35,627                                      | <b>SE</b><br>3,651<br>7,767                      |
| Effort<br>Fishers<br>Fisher days<br>Catch (Marine Finfish)<br>Herring, Australian<br>Mullet, Yelloweye<br>Mulloway<br>Salmon, Australian  | Mid N<br>Number<br>30,825<br>93,263   | 1u.<br>SE<br>5,180<br>23,290                         | Upper<br>Number<br>14,819<br>59,017                                   | 7 Mu.<br>SE<br>3,060<br>16,865           | Inland<br>Number<br>19,389<br>35,627                                   | <b>SE</b><br>3,651<br>7,767                      |
| Effort<br>Fishers<br>Fisher days<br>Catch (Marine Finfish)<br>Herring, Australian<br>Mullet, Yelloweye<br>Mulloway<br>Salmon, Australian<br>Toadfish  | Mid N<br>Number<br>30,825<br>93,263   | 1u.<br>SE<br>5,180<br>23,290                         | Upper<br>Number<br>14,819<br>59,017                                   | 7 Mu.<br>SE<br>3,060<br>16,865           | Inland   Number   19,389   35,627                                      | <b>SE</b><br>3,651<br>7,767                      |
| Effort<br>Fishers<br>Fisher days<br>Catch (Marine Finfish)<br>Herring, Australian<br>Mullet, Yelloweye<br>Mulloway<br>Salmon, Australian<br>Toadfish<br>Catch (Freshwater)  | Mid N<br>Number<br>30,825<br>93,263   | 1u.<br>SE<br>5,180<br>23,290                         | Upper<br>Number<br>14,819<br>59,017                                   | r Mu.<br>SE<br>3,060<br>16,865           | Inland   Number   19,389   35,627                                      | SE<br>3,651<br>7,767                             |
| Effort<br>Fishers<br>Fisher days<br>Catch (Marine Finfish)<br>Herring, Australian<br>Mullet, Yelloweye<br>Mulloway<br>Salmon, Australian<br>Toadfish<br>Catch (Freshwater)<br>Carp  | Mid N<br>Number<br>30,825<br>93,263<br>75,425                                     | lu.<br>SE<br>5,180<br>23,290<br>19,397               | Upper<br>Number<br>14,819<br>59,017<br>27,341                         | r Mu.<br>SE<br>3,060<br>16,865<br>11,304 | Inland   Number   19,389   35,627                                      | SE<br>3,651<br>7,767<br>9,849                    |
| Effort<br>Fishers<br>Fisher days<br>Catch (Marine Finfish)<br>Herring, Australian<br>Mullet, Yelloweye<br>Mulloway<br>Salmon, Australian<br>Toadfish<br>Catch (Freshwater)<br>Carp<br>Perch, golden (callop)  | Mid N<br>Number<br>30,825<br>93,263<br>75,425<br>14,755                           | Iu.<br>SE<br>5,180<br>23,290<br>19,397<br>6,753      | Upper<br>Number<br>14,819<br>59,017<br>27,341<br>3,900                | 11,304<br>1,971                          | Inland<br>Number<br>19,389<br>35,627<br>                               | SE<br>3,651<br>7,767<br>9,849<br>2,064           |
| Effort<br>Fishers<br>Fisher days<br>Catch (Marine Finfish)<br>Herring, Australian<br>Mullet, Yelloweye<br>Mulloway<br>Salmon, Australian<br>Toadfish<br>Catch (Freshwater)<br>Carp<br>Perch, golden (callop)<br>Perch, Redfin                       | Mid N<br>Number<br>30,825<br>93,263<br>   | Iu.   SE   5,180   23,290   19,397   6,753           | Upper<br>Number<br>14,819<br>59,017<br>27,341<br>3,900<br>+           | 11,304<br>1,971                          | Inland<br>Number<br>19,389<br>35,627<br>                               | SE<br>3,651<br>7,767<br>9,849<br>2,064<br>18,077 |
| Effort<br>Fishers<br>Fisher days<br>Catch (Marine Finfish)<br>Herring, Australian<br>Mullet, Yelloweye<br>Mulloway<br>Salmon, Australian<br>Toadfish<br>Catch (Freshwater)<br>Carp<br>Perch, golden (callop)<br>Perch, Redfin<br>Shrimp, Freshwater | Mid N<br>Number<br>30,825<br>93,263<br>93,263<br>75,425<br>14,755<br>+<br>164,831 | Ju.   SE   5,180   23,290   19,397   6,753   120,469 | Upper<br>Number<br>14,819<br>59,017<br>27,341<br>3,900<br>+<br>95,454 | 11,304<br>1,971<br>37,150                | Inland<br>Number<br>19,389<br>35,627<br>16,868<br>3,015<br>40,730<br>+ | SE<br>3,651<br>7,767<br>9,849<br>2,064<br>18,077 |

**Appendix 15.** Species groupings by fishing method as reported by recreational fishers in South Australia during 2021–22. Total catch (retained & released) number in thousands.

| Common name               | Line     | Crab net | Crab<br>pot | Diving/spear | Dab/scoop<br>net |
|---------------------------|----------|----------|-------------|--------------|------------------|
| Catch (Marine Finfish)    |          |          |             |              |                  |
| Albacore                  | 1.464    |          |             |              |                  |
| Australian Herring        | 647.886  |          |             |              | 0.304            |
| Western Australian Salmon | 279.505  | 0.497    |             | 0.066        |                  |
| Barracouta                | 1.19     |          |             |              |                  |
| Bight Redfish             | 38.073   |          |             |              |                  |
| Black Bream               | 30.191   |          |             | 0.687        |                  |
| Blue Mackerel             | 31.291   |          |             |              |                  |
| Blue Devil                | 1.102    |          |             |              |                  |
| Blue Eye Trevalla         | 0.165    |          |             |              |                  |
| Blue Groper               | 0.291    |          |             |              |                  |
| Blue Morwong              | 1.388    |          |             |              |                  |
| Bluethroat Wrasse         | 5.339    |          |             |              |                  |
| Conger Eel                | 0.169    |          |             |              |                  |
| Cowfish                   | 1.461    |          |             |              |                  |
| Dogfish Shark             | 4.637    |          | 0.054       |              |                  |
| Flathead                  | 52.702   | 1.122    |             | 0.044        |                  |
| Flounder                  | 5.31     |          |             |              | 0.287            |
| Garfish                   | 302.858  | 0.313    |             |              | 23.344           |
| Gemfish                   | 0.042    |          |             |              |                  |
| Gummy Shark               | 3.926    |          |             |              |                  |
| Gurnard                   | 2.105    |          |             |              |                  |
| Gurnard Perch             | 2.379    |          |             |              |                  |
| Harlequin Fish            | 1.131    |          |             |              |                  |
| Jack Mackerel             | 0.15     |          |             |              |                  |
| King George Whiting       | 1,830.07 | 4.178    |             |              | 0.243            |
| Kingfish                  | 4.285    |          |             |              |                  |
| Knifejaw                  | 0.01     |          |             |              |                  |
| Leatherjacket             | 76.794   | 3.861    |             |              |                  |
| Ling                      | 0.43     |          |             |              |                  |
| Luderick                  | 2.375    |          |             |              |                  |
| Magpie Perch              | 0.107    |          |             |              |                  |
| Mullet (Unknown sp.)      | 18.603   |          |             |              |                  |
| Mulloway                  | 3.72     |          |             |              |                  |
| Port Jackson Shark        | 14.195   | 0.29     | 0.056       |              |                  |
| Ray and Skate             | 6.69     |          |             |              |                  |

# Appendix 15. Continued.

| Common name            | Line    | Crab<br>net | Diving/spear | Dab/scoop net | Gill/ drag<br>net |
|------------------------|---------|-------------|--------------|---------------|-------------------|
| Catch (Marine Finfish) |         |             |              |               |                   |
| Samsonfish             | 0.036   |             |              |               |                   |
| Scad Mackerel          | 0.117   |             |              |               |                   |
| School Shark           | 1.232   |             |              |               |                   |
| School Whiting         | 122.113 |             |              |               |                   |
| Sea Mullet             | 12.636  |             |              | 2.037         |                   |
| Sergeant Baker         | 1.123   |             |              |               |                   |
| Silver Drummer         | 0.47    |             |              |               |                   |
| Silver Trevally        | 37.76   |             |              |               |                   |
| Snapper                | 59.129  |             |              |               |                   |
| Snook                  | 36.806  |             |              |               |                   |
| Southern Bluefin Tuna  | 4.197   |             |              |               |                   |
| Striped Perch          | 246.206 | 0.28        |              |               |                   |
| Sweep                  | 32.388  |             | 0.293        |               |                   |
| Tailor                 | 0.174   |             |              |               |                   |
| Toadfish               | 93.778  | 0.756       |              |               |                   |
| Trevally (Unknown sp.) | 11.79   |             |              |               |                   |
| Tuna (Unknown sp.)     | 0.478   |             |              |               |                   |
| Unknown Cod            | 70.31   | 0.286       |              |               |                   |
| Unknown Mackerel       | 1.165   |             |              |               |                   |
| Weedy Whiting          | 29.617  |             |              |               |                   |
| Whaler Shark           | 1.292   |             |              |               |                   |
| Wrasse (Unknown sp.)   | 14.05   |             |              |               |                   |
| Yelloweye Mullet       | 64.042  |             |              |               | 5.616             |

Continued on the next page

# Appendix 15. Continued.

| Common name              | Line    | Crab net | Crab pot | Dab/<br>scoop net | Hand collection | Dab/<br>scoop<br>net |
|--------------------------|---------|----------|----------|-------------------|-----------------|----------------------|
| Catch (Marine Invertebra | ates)   |          |          |                   |                 |                      |
| Yellowfin Whiting        | 200.09  |          |          |                   |                 |                      |
| Abalone (Unknown sp.)    |         |          |          | 2.204             |                 |                      |
| Arrow Squid              | 2.765   |          |          |                   |                 |                      |
| Blacklip Abalone         |         |          |          | 3.296             |                 |                      |
| Blue Crab                | 31.791  | 1,463.80 | 1.325    | 58.103            | 243.601         | 164.724              |
| Calamari                 | 572.301 | 0.522    |          |                   |                 | 0.985                |
| Cockle (Unkown sp.)      |         |          |          |                   | 157.246         |                      |
| Crab (other)             | 0.694   | 19.377   | 4.536    |                   |                 |                      |
| Cuttlefish               | 7.808   |          |          |                   |                 |                      |
| Greenlip Abalone         |         |          |          | 4.706             |                 |                      |
| Mud Cockle               |         |          |          |                   | 117.777         |                      |
| Octopus                  | 1.186   |          | 0.498    |                   |                 |                      |
| Other NonFish            |         |          |          |                   | 19.324          |                      |
| Pipi                     |         |          |          |                   | 1,621.95        | 82.087               |
| Razorfish                |         |          |          |                   | 74.944          |                      |
| Rock Lobster             |         | 0.823    | 121.368  | 3.946             |                 |                      |
| Sand Crab                | 3.874   | 13.311   |          |                   | 1.818           |                      |
| Scallop                  |         |          |          | 19.666            |                 |                      |
| Sea Urchin               |         |          |          | 0.135             |                 |                      |
| Squid (Unknown sp.)      | 15.637  |          |          |                   |                 |                      |
| Worm                     |         |          |          |                   |                 | 0.53                 |
| Common na                | me      | Li       | ne       | Diving/spear      | · Hand          | collection           |
| Catch (Freshwater Spec   | ies)    |          |          |                   |                 |                      |
| Bony Bream               |         |          |          | 0.212             |                 |                      |
| Brown Trout              |         | 0.1      | 154      |                   |                 |                      |
| Callop                   |         | 24       | .22      |                   |                 |                      |
| Carp                     |         | 147      | .717     | 1.794             |                 |                      |
| Eel (Unknown sp.)        |         | 0.0      | )37      |                   |                 |                      |
| Freshwater Catfish       |         | 2.7      | 715      |                   |                 |                      |
| Murray Cod               |         | 2.4      | 435      |                   |                 |                      |
| Rainbow Trout            |         | 1.7      | 736      |                   |                 |                      |
| Redfin Perch             |         | 42.      | 489      |                   |                 |                      |
| Silver Perch             |         | 0.4      | 434      | 0.098             |                 |                      |
| Freshwater Shrimp        |         | 0.2      | 202      | 279.499           |                 | 1.907                |
| Freshwater Yabby         |         |          |          | 895.482           | 2               | 19.358               |

**Appendix 16.** Species groupings used in the analyses of targeted catch and effort during the 2021–22 South Australian Recreational Fishing Survey.

| Target group           | Species name           | Target group          | Species name         |
|------------------------|------------------------|-----------------------|----------------------|
| Haliotis               | Abalone, Blacklip      | Gurnard               | Gurnard              |
|                        | Abalone, Greenlip      | Hapuku                | Hapuku               |
|                        | Abalone, Unknown       | Harlequin fish        | Harlequin Fish       |
| Barracouta             | Barracouta             | Kingfish              | Kingfish, Yellowtail |
| Blackfish              | Blackfish              | Knifejaw              | Knifejaw             |
| BlueMarlin             | Marlin, Blue           | Leatherjacket         | Leatherjacket        |
| BlueWarehou            | Warehou, Blue          | Ling                  | Ling                 |
| BonyBream              | Bream, Bony            | Lobster               | Rock Lobster,        |
| Bream                  | Bream, Black           | Luderick              | Luderick (Zebrafish) |
| Carp                   | Carp                   | Mackerel              | Mackerel, Blue Slimy |
| Catfish                | Catfish - Unknown      |                       | Mackerel, Jack       |
| Catfish                | Catfish, Freshwater    |                       | Mackerel, Scad       |
| Cockles                | Cockles, Mud           |                       | Mackerel, Unknown    |
|                        | Cockles, Unknown       | MacrobrachiumCherabin | Macrobrachium        |
|                        | Pipi                   | Marine perch          | Perch, Gurnard       |
| Cod                    | Cod, Marine            |                       | Perch, Magpie        |
| Cowfish/toads          | Cowfish                |                       | Perch, Marine        |
|                        | Toadfish               | Morwong               | Morwong, Blue        |
| Crab                   | Crab, Blue Swimmer     |                       | Morwong, Dusky       |
|                        | Crab, Other            |                       | Morwong, Jackass     |
|                        | Crab, Sand             | Muglidae -group       | Mullet, Sea          |
| Cuttlefish             | Cuttlefish             |                       | Mullet, Unknown      |
| DartSwallowtail        | Swallowtail, Dart      |                       | Mullet, Yelloweye    |
| DolphinFish            | DolphinFish            | Mullet - red          | Mullet, Red          |
| Drummer                | Drummer, Silver        | Mulloway              | Mulloway             |
| Eel - Conger           | Eel, Conger            | MurrayCod             | Cod, Murray          |
| Eel - Freshwater       | Eel, Unknown           | MurrayCrayfish        | Crayfish, Murray     |
| ElephantFish           | Elephant fish          | Nannygai              | Redfish, Bight       |
| Finfish.marine.unknown | Finfish, Marine        | Octopus               | Octopus              |
| Flathead               | Flathead               | OldWife               | Old Wife             |
| Flounder               | Flounder               | Prawns                | Prawns               |
| Freshwater perch       | Perch, Golden (callop) | RaysSkates            | Rays and Skates      |
|                        | Perch, Redfin          | Razorfish             | Razorfish            |
|                        | Perch, Silver          | Salmon (arripis)      | Herring, Australian  |
|                        | Perch, Spangled        |                       | Salmon, Australian   |
| Freshwater             | Shrimp, Freshwater     | SamsonFish            | Samsonfish           |
| shrimp/yabby           | Yabby, Freshwater      | Scallop               | Scallop              |
| Garfish                | Garfish, Southern      | SeaUrchin             | Sea Urchin           |
| Gemfish                | Gemfish                | Sergeant baker        | Sergeant Baker       |

# Appendix 16. Continued.

| Target group         | Species name                             |
|----------------------|--|
| Shark                | Shark, Blue                              |
|                      | Shark, Bronze Whaler                     |
|                      | Shark, Dogfish                           |
|                      | Shark, Gummy                             |
|                      | Shark, Hammerhead                        |
|                      | Shark, Mako                              |
|                      | Shark, Port Jackson                      |
|                      | Shark, School                            |
|                      | Shark, Sevengilled                       |
|                      | Shark, Unknown                           |
|                      | Shark, Wobbegong                         |
| Silverbiddy          | Silverbiddy                              |
| Snapper              | Snapper                                  |
| Snook                | Snook                                    |
| Squid                | Calamari, Southern                       |
|                      | Squid, Arrow                             |
|                      | Squid, Unknown                           |
| Sweep                | Sweep                                    |
| Tailor               | Tailor                                   |
| Trevalla             | Trevalla, Blue Eye                       |
| Trevally             | Trevally, Silver                         |
|                      | Trevally, Unknown                        |
| Trout                | Trout, Brown                             |
|                      | Trout, Rainbow                           |
|                      | Trout, Unknown                           |
| Trumpeter            | Perch, Striped (Western Striped Grunter) |
|                      | Trumpeter, Striped                       |
|                      | Trumpeter, Unknown                       |
| Tuna                 | Albacore                                 |
|                      | Tuna, Southern Bluefin                   |
|                      | Tuna, Unknown                            |
| WesternBlueDevilFish | Blue Devil, Western                      |
| WesternBlueGroper    | Groper, Western Blue                     |
| Whiting              | Whiting, King George                     |
|                      | Whiting, School                          |
|                      | Whiting, Unknown                         |
|                      | Whiting, Yellowfin                       |
| vvorms               | Worms, Beach                             |
|                      | Worms, Other                             |
| vvrasse              | Whiting, Weedy                           |
|                      | Wrasse, Bluethroat                       |
|                      | Wrasse, Unknown                          |

**Appendix 17.** Annual recreational catch (retained and released, by number) of key species by targeted and non-targeted effort during 2021–22 based on South Australian residents aged five years or older. SE is standard error; + indicates value <1000; values in bold indicate relative standard error >40%, values in italics indicate that fewer than 30 households recorded catches of the species/species group.

|                           | Targeted  |         | Non-Tai | rgeted  | % Torgotod |
|---------------------------|-----------|---------|---------|---------|------------|
| Species                   | Number    | SE      | Number  | SE      | % Targeteu |
| Marine Finfish            |           |         |         |         |            |
| Bream, Black              | 14,432    | 5,502   | 16,446  | 5,404   | 47%        |
| Flathead                  | 9,696     | 4,281   | 44,172  | 9,736   | 18%        |
| Flounder                  | -         |         | 5,597   | 3,067   | -          |
| Garfish, Southern         | 196,358   | 44,881  | 131,850 | 30,573  | 60%        |
| Herring, Australian       | 208,589   | 47,673  | 439,600 | 70,148  | 32%        |
| Kingfish, Yellowtail      | 3,221     | 1,840   | 1,063   | 928     | 75%        |
| Leatheriacket             | 5.027     | 3.515   | 75.628  | 12.358  | 6%         |
| Mackerel, Blue Slimv      | 1.386     | 1.852   | 29,905  | 15.410  | 4%         |
| Mullet, Red (goatfish)    | -         | ,       | 47,914  | 13,711  | -          |
| Mullet, Sea               | 2.455     | 2.025   | 12.218  | 6.190   | 17%        |
| Mullet, Yelloweve         | 49.543    | 19.941  | 20,115  | 5.899   | 71%        |
| Mulloway                  | 2.198     | 974     | 1.522   | 667     | 59%        |
| Rays and Skates           |           |         | 6,690   | 1.844   | -          |
| Salmon Western Australian | 123 085   | 27 357  | 156 983 | 31 623  | 44%        |
| Shark, Gummy              | +         |         | 2.980 ^ | 1.095 ^ | 24%        |
| Shark, Port Jackson       | -         |         | 14.541  | 3.814   | -          |
| Snapper                   | 6.959     | 5.286   | 52,171  | 11,970  | 12%        |
| Snook                     | 21.533    | 8,985   | 15 273  | 4 356   | 59%        |
| Sweep                     | 3.495     | 1.757   | 29,186  | 9,694   | 11%        |
| Toadfish                  | -         | -,      | 94,534  | 28.508  | -          |
| Trevally, Silver          | 18.313    | 12.927  | 19,446  | 6.326   | 48%        |
| Tuna, Southern Bluefin    | 4.083     | 1.696   | +       | -,      | 97%        |
| Whiting, King George      | 1.712.272 | 246.534 | 122.220 | 33.598  | 93%        |
| Whiting, School           | 91.644    | 71.780  | 30.468  | 9.115   | 75%        |
| Whiting, Weedy            | -         | ,       | 29.617  | 8,943   | -          |
| Whiting, Yellowfin        | 144.368   | 89.456  | 55,722  | 19.211  | 72%        |
| Wrasse, Bluethroat        | -         | ,       | 5.339   | 2.320   | -          |
| Marine Invertebrates      |           |         | -,      | _,      |            |
| Abalone, Blacklip         | 1.633     | 1.601   | 1.664   | 1.277   | 50%        |
| Abalone, Greenlip         | 2,458     | 1,905   | 2,248   | 1.334   | 52%        |
| Calamari, Southern        | 452.040   | 62.995  | 121.767 | 19,902  | 79%        |
| Cockle, Mud               | 16.501    | 35.707  | 101.277 | 60.120  | 14%        |
| Crab. Blue Swimmer        | 1.818.992 | 276.814 | 144.348 | 103.679 | 93%        |
| Crab. Sand                | 7.035     | 4.764   | 11.968  | 3.250   | 37%        |
| Cuttlefish                | 1.521     | 1.380   | 6,287   | 2,588   | 19%        |
| Pipi                      | 1.704.036 | 724,350 | -,      | _,      | 100%       |
| Razorfish                 | 92.851    | 52.631  | 2,311   | 2.261   | 98%        |
| Rock Lobster, Southern    | 126.010   | 36.706  | +       | _,      | 100%       |
| Scallop                   | 18,261    | 11,036  | 1,983   | 1,526   | 90%        |

# Appendix 17. Continued

|                        | Targeted |         | Non-Targe | % targeted |      |
|------------------------|----------|---------|-----------|------------|------|
| Species                | Number   | SE      | Number    | SE         |      |
| Freshwater Species     |          |         |           |            |      |
| Carp                   | 74,754   | 19,694  | 74,757    | 13,577     | 50%  |
| Catfish, freshwater    | +        |         | 2,510     | 1,070      | 8%   |
| Cod, Murray            | +        |         | 1,952     | 808        | 20%  |
| Perch, Golden (callop) | 18,385   | 7,139   | 5,834     | 2,269      | 76%  |
| Perch, Redfin          | 33,564   | 14,030  | 9,270     | 5,261      | 78%  |
| Trout, Rainbow         | 1,732    | 1,630   | +         |            | 100% |
| Shrimp, Freshwater     | 178,143  | 120,645 | 103,465   | 36,451     | 63%  |
| Yabby, Freshwater      | 941,951  | 341,660 | 4,953     | 2,719      | 99%  |

**Appendix 18.** Annual recreational harvest (retained, by number) of key species by targeted and non-targeted effort during 2021–22 based on South Australian residents aged five years or older. SE is standard error; + indicates value <1000; values in bold indicate relative standard error >40%, values in italics indicate that fewer than 30 households recorded catches of the species/species group.

|                            | Targeted  |         | Non-Tar | Non-Targeted |            |  |
|----------------------------|-----------|---------|---------|--------------|------------|--|
| Species                    | Number    | SE      | Number  | SE           | % Targeted |  |
| Marine Finfish             |           |         |         |              |            |  |
| Bream, Black               | 1,883     | 1,077   | 5,622   | 3,511        | 25%        |  |
| Flathead                   | 3,714     | 1,954   | 22,906  | 4,604        | 14%        |  |
| Flounder                   |           |         | 2,400   | 1,429        |            |  |
| Garfish, Southern          | 161,715   | 37,170  | 102,791 | 24,990       | 61%        |  |
| Herring, Australian        | 153,466   | 39,325  | 298,544 | 50,726       | 34%        |  |
| Kingfish, Yellowtail       | 1,272     | 751     | +       |              | 63%        |  |
| Leatherjacket              | 3,778     | 3,403   | 29,927  | 6,873        | 11%        |  |
| Mackerel, Blue Slimy       | 1,386     | 1,852   | 24,189  | 11,331       | 5%         |  |
| Mullet, Red (goatfish)     |           |         | 22,285  | 6,323        |            |  |
| Mullet, Sea                | +         |         | 10,957  | 6,011        | 7%         |  |
| Mullet, Yelloweye          | 45,002    | 18,509  | 13,623  | 4,003        | 77%        |  |
| Mulloway                   | 1,552     | 796     | +       |              | 82%        |  |
| Rays and Skates            |           |         |         |              |            |  |
| Salmon, Western Australian | 67,649    | 19,458  | 86,964  | 17,557       | 44%        |  |
| Shark, Gummy               | +         |         | 1,815   | 679          | 29%        |  |
| Shark, Port Jackson        |           |         | +       |              |            |  |
| Snapper                    | 4,689     | 3,733   | +       |              | 92%        |  |
| Snook                      | 20,141    | 8,387   | 14,736  | 4,249        | 58%        |  |
| Sweep                      | 3,354     | 1,704   | 15,128  | 7,528        | 18%        |  |
| Toadfish                   |           | ,       | 3,273   | 1,692        |            |  |
| Trevally, Silver           | 17,768    | 12,937  | 15.335  | 5,872        | 54%        |  |
| Tuna, Southern Bluefin     | 2,970     | 1,169   | +       |              | 96%        |  |
| Whiting, King George       | 1,075,369 | 136,256 | 54,205  | 11,929       | 95%        |  |
| Whiting, School            | 35,986    | 25,747  | 18,606  | 6,336        | 66%        |  |
| Whiting, Weedy             |           |         | 6,401   | 2,700        |            |  |
| Whiting, Yellowfin         | 110.658   | 68,824  | 28,701  | 11.511       | 79%        |  |
| Wrasse, Bluethroat         | ,         | ,       | 2,001   | 1,167        |            |  |
| Marine Invertebrates       |           |         | •       |              |            |  |
| Abalone, Blacklip          | 1,633     | 1,601   | 1,664   | 1,277        | 50%        |  |
| Abalone, Greenlip          | 2,278     | 1,738   | 1,516   | 928          | 60%        |  |
| Calamari, Southern         | 429,277   | 60,504  | 120,902 | 19,833       | 78%        |  |
| Cockle, Mud                | 10,055    | 21,759  | 83,429  | 56,320       | 11%        |  |
| Crab, Blue Swimmer         | 895,340   | 120,277 | 25,382  | 7,958        | 97%        |  |
| Crab, Sand                 | 2,492     | 1,276   | 4,195   | 2,058        | 37%        |  |
| Cuttlefish                 |           |         | 2,518   | 1,060        | 0%         |  |
| Pipi                       | 1,149,016 | 613,423 |         |              | 100%       |  |
| Razorfish                  | 92,851    | 52,631  | 2,311   | 2,261        | 98%        |  |
| Rock Lobster, Southern     | 80,823    | 21,306  | +       |              | 100%       |  |
| Scallop                    | 15,265    | 8,614   | 1,821   | 1,375        | 89%        |  |

# Appendix 18. Continued.

|                        | Targeted |         | Non-Tar | Non-Targeted |            |  |  |
|------------------------|----------|---------|---------|--------------|------------|--|--|
| Species                | Number   | SE      | Number  | SE           | % Targeted |  |  |
| Freshwater Species     |          |         |         |              |            |  |  |
| Carp                   | 74,754   | 19,694  | 74,058  | 13,411       | 50%        |  |  |
| Catfish, freshwater    |          |         | +       |              | 0%         |  |  |
| Cod, Murray            |          |         |         |              |            |  |  |
| Perch, golden (callop) | 10,933   | 3,890   | 1,788   | 754          | 86%        |  |  |
| Perch, Redfin          | 32,297   | 13,736  | 9,016   | 5,255        | 78%        |  |  |
| Trout, Rainbow         | +        |         |         |              | 100%       |  |  |
| Shrimp, Freshwater     | 118,212  | 85,855  | 75,895  | 30,526       | 61%        |  |  |
| Yabby, Freshwater      | 712,074  | 289,227 | 2,372   | 1,732        | 100%       |  |  |

**Appendix 19.** Annual recreational harvest (retained, by number) of key species by water body type during 2021–22 based on South Australian residents aged five years or older. SE is standard error; + indicates value <1000; values in bold indicate relative standard error >40%, italics indicate that fewer than 30 households recorded catches of the species/species group. Continued over page.

|   | Inshore   |         | Offshore |        | Estua  | ary    |
|---|-----------|---------|----------|--------|--------|--------|
|   | Number    | SE      | Number   | SE     | Number | SE     |
| Harvest (Marine Finfish)                            |           |         |          |        |        |        |
| Bream, Black  | 4,083     | 3,376   |          |        | 3,422  | 1,438  |
| Flathead  | 22,098    | 5,206   | 3,442    | 2,729  | 1,080  | 1,044  |
| Flounder  | 2,394     | 1,429   | +        |        |        |        |
| Garfish, Southern                                   | 245,160   | 50,857  | 18,862   | 7,996  | +      |        |
| Herring, Australian                                 | 438,834   | 68,889  | 10,724   | 3,189  | 2,452  | 2,108  |
| Kingfish, Yellowtail                                | +         |         | 1,136    | 691    |        |        |
| Leatherjacket                                       | 31,281    | 9,177   | 2,424    | 1,057  |        |        |
| Mackerel, Blue Slimy                                | 21,806    | 11,469  | 3,769    | 2,658  |        |        |
| Mullet, Red (goatfish)                              | 19,983    | 6,132   | 2,303    | 1,310  |        |        |
| Mullet, sea   | 11,751    | 6,041   |          |        | +      |        |
| Mullet, Yelloweye                                   | 53,692    | 19,254  |          |        | 4,933  | 4,360  |
| Mulloway  | 1,886     | 843     |          |        |        |        |
| Perch, Striped (Western Striped Grunter)            | 117,299   | 41,918  | 5,381    | 3,805  | +      |        |
| Redfish, Bight (Nannygai, Red Snapper, Swallowtail) | 2,866     | 1,678   | 23,005   | 7,583  |        |        |
| Salmon, Western Australian                          | 135,476   | 29,089  | 3,417    | 1,466  | 15,721 | 7,583  |
| Snapper   | 4,674     | 3,729   | +        |        |        |        |
| Snook   | 31,902    | 10,671  | 2,483    | 1,169  | +      |        |
| Sweep   | 16,407    | 7,621   | 2,075    | 1,216  |        |        |
| Toadfish  | 3,273     | 1,692   |          |        |        |        |
| Trevally, Silver                                    | 16,924    | 6,266   | 16,180   | 12,843 |        |        |
| Tuna, Southern Bluefin                              | +         |         | 2,341    | 1,104  |        |        |
| Whiting, King George                                | 995,299   | 128,486 | 132,039  | 25,579 | 2,236  | 1,408  |
| Harvest (Marine Invertebrates)                      |           |         |          |        |        |        |
| Calamari, Southern                                  | 525,520   | 68,029  | 23,260   | 6,869  | 1,399  | 1,551  |
| Cockle, Mud   | 93,484    | 60,377  |          |        |        |        |
| Crab, Blue Swimmer                                  | 883,739   | 119,547 | 15,069   | 6,151  | 21,912 | 18,176 |
| Crab, Sand  | 6,645     | 2,421   | +        |        |        |        |
| Cuttlefish  | 2,470     | 1,049   | +        |        |        |        |
| Pipi  | 1,149,016 | 613,423 |          |        |        |        |
| Razorfish   | 76,156    | 51,939  | 19,005   | 6,519  |        |        |
| Rock Lobster, Southern                              | 72,923    | 20,126  | 8,026    | 5,165  |        |        |
| Scallop   | 17,085    | 8,719   |          |        |        |        |

### Appendix 19. Continued.

|                              | Freshwat | er River | Lanke/ | Dam    |
|------------------------------|----------|----------|--------|--------|
|                              | Number   | SE       | Number | SE     |
| Harvest (Freshwater Species) |          |          |        |        |
| Carp                         | 132,379  | 25,699   | 16,434 | 6,127  |
| Shrimp, Freshwater           | 194,108  | 91,431   |        |        |
| Perch, golden (callop)       | 12,197   | 3,944    | +      |        |
| Perch, Redfin                | 3,925    | 1,792    | 37,388 | 17,605 |
| Yabby, Freshwater            | 676,898  | 288,652  | 37,549 | 16,576 |

**Appendix 20.** Annual recreational harvest (retained, by number) of key species by fishing method during 2021–22, based on South Australian residents aged five years or older. SE is standard error; + indicates value <1000, values in bold indicate relative standard error >40%, values in red italics indicate that fewer than 30 households recorded catches.

|  | Lin       | Line    |        | et  | Lobster p | oot | Spear/ Di | Spear/ Dive |        | Hand |  |
|--|-----------|---------|--------|-----|-----------|-----|-----------|-------------|--------|------|--|
|  | Number    | SE      | Number | SE  | Number    | SE  | Number    | SE          | Number | SE   |  |
| Harvest (Marine Finfish)                               |           |         |        |     |           |     |           |             |        |      |  |
| Bream, Black   | 6,818     | 3,630   |        |     |           |     | +         |             |        |      |  |
| Flathead   | 25,454    | 5,926   | 1,122  | 706 |           |     | +         |             |        |      |  |
| Flounder   | 2,113     | 1,412   |        |     |           |     |           |             |        |      |  |
| Garfish, Southern                                      | 246,036   | 51,193  | +      |     |           |     |           |             |        |      |  |
| Herring, Australian                                    | 451,706   | 69,167  |        |     |           |     |           |             |        |      |  |
| Kingfish, Yellowtail                                   | 2,004     | 947     |        |     |           |     |           |             |        |      |  |
| Leatherjacket  | 32,865    | 9,229   | +      |     |           |     |           |             |        |      |  |
| Mackerel, Blue Slimy                                   | 25,575    | 11,763  |        |     |           |     |           |             |        |      |  |
| Mullet, Red (goatfish)                                 | 22,285    | 6,323   |        |     |           |     |           |             |        |      |  |
| Mullet, Sea  | 9,741     | 5,715   |        |     |           |     |           |             |        |      |  |
| Mullet, Yelloweye                                      | 54,132    | 19,259  |        |     |           |     |           |             |        |      |  |
| Mulloway   | 1,886     | 843     |        |     |           |     |           |             |        |      |  |
| Perch, Striped (Western<br>Striped Grunter)            | 122,465   | 44,728  | +      |     |           |     |           |             |        |      |  |
| Redfish, Bight (Nannygai,<br>Red Snapper, Swallowtail) | 25,871    | 7,934   |        |     |           |     |           |             |        |      |  |
| Salmon, Western Australian                             | 154,050   | 30,428  | +      |     |           |     | +         |             |        |      |  |
| Snapper  | 5,070     | 3,733   |        |     |           |     |           |             |        |      |  |
| Snook  | 34,877    | 10,748  |        |     |           |     |           |             |        |      |  |
| Sweep  | 18,190    | 7,712   |        |     |           |     | +         |             |        |      |  |
| Toadfish   | 3,273     | 1,692   | +      |     |           |     |           |             |        |      |  |
| Trevally, Silver                                       | 33,104    | 14,403  |        |     |           |     |           |             |        |      |  |
| Tuna, Southern Bluefin                                 | 3,084     | 1,172   |        |     |           |     |           |             |        |      |  |
| Whiting, King George                                   | 1,128,286 | 137,787 | 1,044  | 976 |           |     |           |             |        |      |  |

### Appendix 20. Continued.

|                                | Lir     | ne       | Crab    | net     | Lobster pot |         |  |
|--------------------------------|---------|----------|---------|---------|-------------|---------|--|
|                                | Number  | SE       | Number  | SE      | Number      | SE      |  |
| Harvest (Marine Invertebrates) |         |          |         |         |             |         |  |
| Calamari, Southern             | 548,673 | 69,304   | +       |         |             |         |  |
| Cockle, Mud                    |         |          |         |         |             |         |  |
| Crab, Blue Swimmer             | 16,259  | 4,844    | 721,738 | 110,638 | +           |         |  |
| Crab, Sand                     | +       |          | 4,630   | 1,741   |             |         |  |
| Cuttlefish                     | 2,518   | 1,060    |         |         |             |         |  |
| Pipi                           |         |          |         |         |             |         |  |
| Razorfish                      |         |          |         |         |             |         |  |
| Rock Lobster, Southern         |         |          | +       |         | 76,987      | 21,200  |  |
| Scallop                        |         |          |         |         |             |         |  |
| Harvest (Freshwater)           |         |          |         |         |             |         |  |
| Carp                           | 147,018 | 26,905   |         |         |             |         |  |
| Perch, golden (callop)         | 12,721  | 3,973    |         |         |             |         |  |
| Perch, Redfin                  | 40,968  | 17,870   |         |         |             |         |  |
| Shrimp, Freshwater             | +       |          |         |         |             |         |  |
| Yabby, Freshwater              |         |          |         |         |             |         |  |
|                                |         | Spear/ D | ive     |         | Hand        | l       |  |
|                                | 1       | Number   | SE      |         | Number      | SE      |  |
| Harvest (Marine Invertebrates) |         |          |         |         |             |         |  |
| Calamari, Southern             |         |          |         |         |             |         |  |
| Cockle, Mud                    |         |          |         |         | 93,484      | 60,377  |  |
| Crab, Blue Swimmer             |         | 36,271   | 28,007  |         | 101,884     | 22,776  |  |
| Crab, Sand                     |         |          |         |         | 1,818       | 1,670   |  |
| Cuttlefish                     |         |          |         |         |             |         |  |
| Pipi                           |         |          |         |         | 1,099,764   | 611,481 |  |
| Razorfish                      |         |          |         |         | 74,944      | 51,913  |  |
| Rock Lobster, Southern         |         | 3,361    | 2,498   |         |             |         |  |
| Scallop                        |         | 16,508   | 8,700   |         |             |         |  |
| Harvest (Freshwater)           |         |          |         |         |             |         |  |
| Carp                           |         |          |         |         |             |         |  |
| Perch, golden (callop)         |         |          |         |         |             |         |  |
| Perch, Redfin                  |         |          |         |         |             |         |  |
| Shrimp, Freshwater             |         |          |         |         | 1,907       | 1,836   |  |
| Yabby, Freshwater              |         |          |         |         | 48,916      | 34,139  |  |

**Appendix 21.** Annual recreational catch (retained and released, by number) of key species by fishing platform during 2021–22, based on South Australian residents aged five years or older.SE is standard error; + indicates value <1000; values in bold indicate relative standard error >40%, values in italics indicate that fewer than 30 households recorded catches of the species/species group.

|  | Boat      |         | Sh        | ore     |  |
|--|-----------|---------|-----------|---------|--|
|  | Number    | SE      | Number    | SE      |  |
| Catch (Marine Finfish)                                 |           |         |           |         |  |
| Bream, Black   | 1,406     | 1,016   | 29,471    | 7,791   |  |
| Flathead   | 35,887    | 11,859  | 17,982    | 4,926   |  |
| Flounder   | 2,777     | 1,922   | 2,820     | 2,391   |  |
| Garfish, Southern                                      | 231,574   | 48,785  | 96,634    | 35,144  |  |
| Herring, Australian                                    | 354,360   | 69,116  | 293,829   | 62,769  |  |
| Kingfish, Yellowtail                                   | 3,510     | 1,949   | +         |         |  |
| Leatherjacket  | 64,944    | 11,443  | 15,710    | 5,996   |  |
| Mackerel, Blue Slimy                                   | 30,113    | 15,632  | 1,178     | 1,777   |  |
| Mullet, Red (goatfish)                                 | 43,187    | 13,174  | 4,727     | 3,421   |  |
| Mullet, Sea  | 2,215     | 1,927   | 12,458    | 5,202   |  |
| Mullet, Yelloweye                                      | 6,335     | 5,443   | 63,322    | 20,852  |  |
| Mulloway   | +         |         | 3,296     | 1,165   |  |
| Perch, Striped (Western Striped Grunter)               | 176,919   | 51,278  | 69,567    | 24,964  |  |
| Redfish, Bight<br>(Nannygai, Red Snapper, Swallowtail) | 38,073    | 11,431  | -         |         |  |
| Salmon, Western Australian                             | 58,391    | 12,017  | 221,678   | 44,284  |  |
| Snapper  | 58,353    | 13,035  | +         |         |  |
| Snook  | 30,716    | 10,492  | 6,090     | 4,609   |  |
| Sweep  | 12,732    | 3,572   | 19,949    | 9,211   |  |
| Toadfish   | 76,817    | 27,978  | 17,716    | 4,327   |  |
| Trevally, Silver                                       | 29,117    | 13,935  | 8,643     | 4,638   |  |
| Tuna, Southern Bluefin                                 | 4,197     | 1,697   | -         |         |  |
| Whiting, King George                                   | 1,759,342 | 240,185 | 75,150    | 22,449  |  |
| Catch (Marine Invertebrates)                           |           |         |           |         |  |
| Calamari, Southern                                     | 395,223   | 53,490  | 178,585   | 47,097  |  |
| Cockle, Mud  | 9,687     | 20,962  | 108,091   | 61,901  |  |
| Crab, Blue Swimmer                                     | 1,060,516 | 220,881 | 902,824   | 255,107 |  |
| Crab, Sand   | 9,962     | 4,978   | 9,041     | 2,921   |  |
| Cuttlefish   | 4,517     | 2,384   | 3,291     | 1,711   |  |
| Pipi   | -         |         | 1,704,036 | 724,350 |  |
| Razorfish  | 82,564    | 50,056  | 12,597    | 7,962   |  |
| Rock Lobster, Southern                                 | 125,117   | 36,697  | 1,019     | 989     |  |
| Scallop  | 17,101    | 10,674  | 3,143     | 3,224   |  |
| Catch (Freshwater Species)                             |           |         |           |         |  |
| Carp   | 31,136    | 7,962   | 118,375   | 24,681  |  |
| Perch, Golden  | 15,003    | 6,913   | 9,216     | 2,754   |  |
| Perch, Redfin  | 1,392     | 647     | 41,441    | 18,087  |  |
| Shrimp, Freshwater                                     | 77,474    | 32,627  | 204,134   | 122,407 |  |
| Yabby, Freshwater                                      | 561,425   | 277,210 | 385,479   | 197,619 |  |

**Appendix 22.** Annual recreational harvest (retained, by number) for key species by fishing platform during 2021–22, based on South Australian residents aged five years or older. SE is standard error; + indicates value <1000; values in bold indicate relative standard error >40%, values in italics indicate that fewer than 30 households recorded catches of the species/species group.

|  | Boa                     | at      | Shore         |         |  |
|--|-------------------------|---------|---------------|---------|--|
|  | Number                  | SE      | Number        | SE      |  |
| Harvest (Marine Finfish)                 |                         |         |               |         |  |
| Bream, Black                             | +                       |         | 7,505         | 3,671   |  |
| Flathead                                 | 19,581                  | 5,555   | 7,039         | 1,972   |  |
| Flounder                                 | 1,994                   | 1,402   | +             |         |  |
| Garfish, Southern                        | 193,151                 | 41,115  | 71,355        | 25,430  |  |
| Herring, Australian                      | 238,582                 | 48,010  | 213,429       | 47,630  |  |
| Kingfish, Yellowtail                     | 1,711                   | 902     | +             |         |  |
| Leatherjacket                            | 24,626                  | 5,994   | 9,079         | 5,045   |  |
| Mackerel, Blue Slimy                     | 24,397                  | 11,630  | 1,178         | 1,777   |  |
| Mullet, Red (goatfish)                   | 18,045                  | 5,167   | 4,240         | 3,397   |  |
| Mullet, Sea                              | 1,945                   | 1,786   | 9,833         | 4,741   |  |
| Mullet, Yelloweye                        | 5,212                   | 4,363   | 53,413        | 19,159  |  |
| Mulloway                                 | +                       |         | 1,593         | 802     |  |
| Perch, Striped (Western Striped Grunter) | 96,594                  | 41,357  | 26,151        | 17,063  |  |
| Redfish, Bight                           | 25,871                  | 7,934   | -             |         |  |
| (Nalinygal, Red Shapper, Swallowtall)    | 10 110                  | 7 709   | 114 503       | 20.285  |  |
| Saimon, western Australian               | 40,110<br>5.070         | 2 7 2 2 | 114,505       | 29,205  |  |
| Shapper                                  | 3,070                   | 0,730   | F 000         | 4 600   |  |
| Shook                                    | 20,707                  | 9,712   | 0,090         | 4,009   |  |
| Sweep                                    | 9,000                   | 3,123   | 0,790         | 7,070   |  |
| Travelly Silver                          | 2,000                   | 1,001   | -<br>5 092    | 4 500   |  |
| Trevally, Silver                         | 21,121                  | 13,071  | 5,983         | 4,500   |  |
|  | 3,004                   | 1,172   | -             | 10.670  |  |
| VVniting, King George                    | 1,097,143               | 135,314 | 32,431        | 10,672  |  |
| Harvest (Marine Invertebrates)           | 270.050                 | 50.044  | 470 407       | 46 700  |  |
| Calamari, Southern                       | 378,052                 | 50,644  | 97.490        | 46,709  |  |
|  | 617 790                 | 109.019 | <b>07,400</b> | 50,999  |  |
| Crab, Blue Swimmer                       | 017,700<br><b>4 922</b> | 100,010 | 302,941       | 34,100  |  |
|  | 1,022                   | 1,022   | 4,000         | 2,190   |  |
|  | 1,372                   | 034     | 1,140         | 030     |  |
| Pipi                                     | -                       | 50.056  | 1,149,010     | 013,423 |  |
| Razorfish                                | 82,564                  | 50,056  | 12,597        | 7,962   |  |
| Rock Lobster, Southern                   | 79,930                  | 21,287  | 1,019         | 989     |  |
| Scallop                                  | 13,942                  | 8,117   | 3,143         | 3,224   |  |
| Harvest (Freshwater Species)             | 04.400                  | 7.000   | 4 4 7 0 7 7   | 04.500  |  |
| Carp                                     | 31,136                  | 7,962   | 117,677       | 24,593  |  |
| Perch, golden (callop)                   | 8,/12                   | 3,712   | 4,009         | 1,317   |  |
| Perch, Redfin                            | 1,392                   | 04/     | 39,920        | 77,860  |  |
| Shrimp, Freshwater                       | 35,413                  | 19,156  | 158,695       | 89,565  |  |
| Yabby, Freshwater                        | 537,741                 | 273,114 | 176,705       | 92,489  |  |

**Appendix 23.** Annual recreational harvest (retained, by number) for key species by fishing region during 2021–22, based on South Australian residents aged five years or older. SE is standard error; + indicates value <1000; values in bold indicate relative standard error >40%, values in italics indicate that fewer than 30 households recorded catches of the species/species group.

|                              | WC      |        | Coffin |        | SS      | SSG    |        | ISG      |
|------------------------------|---------|--------|--------|--------|---------|--------|--------|----------|
|                              | Number  | SE     | Number | SE     | Number  | SE     | Numbe  | r SE     |
| Catch (Marine Finfish)       |         |        |        |        |         |        |        |          |
| Flathead                     | 4,332   | 1,803  | 2,471  | 776    | 1,148   | 447    | 3,824  | 1,742    |
| Flounder                     |         |        | +      |        |         |        | 1,800  | 1,392    |
| Garfish, Southern            | 10,869  | 7,834  | 7,659  | 6,510  | 93,747  | 30,344 | 30,429 | 10,179   |
| Herring, Australian          | 81,486  | 33,129 | 19,414 | 9,686  | 71,635  | 18,935 | 65,915 | 23,313   |
| Kingfish, Yellowtail         |         |        |        |        |         |        | +      |          |
| Leatherjacket                | 2,384   | 1,697  | +      |        | 7,429   | 2,608  | 11,515 | 7,608    |
| Mackerel, Blue Slimy         |         |        |        |        | 3,757   | 2,756  | +      |          |
| Mullet, Red (goatfish)       | 3,337   | 2,679  | +      |        | 7,866   | 3,750  | +      |          |
| Mullet, Sea                  |         |        |        |        |         |        |        |          |
| Mullet, Yelloweye            | 4,319   | 2,584  | 1,060  | 904    | 1,662   | 812    | 1,787  | 1,158    |
| Mulloway                     | 1,195   | 715    |        |        |         |        |        |          |
| Perch, Striped               | 25,442  | 19,234 | +      |        | 1,872   | 1,195  | 74,505 | 42,959   |
| Redfish, Bight               | 2,220   | 1,945  | 7,932  | 4,497  | +       |        |        |          |
| Salmon, Western Australian   | 21,280  | 5,508  | 13,123 | 4,590  | 13,200  | 4,336  | 14,837 | 5,053    |
| Snapper                      |         |        |        |        |         |        | +      |          |
| Snook                        | 1,092   | 612    | +      |        | 9,198   | 3,550  | 1,968  | 1,329    |
| Sweep                        | +       |        | +      |        | +       |        | 2,381  | 2,043    |
| Toadfish                     |         |        |        |        | +       |        | 2,235  | 1,562    |
| Trevally, Silver             | 6,553   | 4,521  | +      |        | 2,362   | 1,270  | 2,137  | 2,081    |
| Tuna, Southern Bluefin       | +       |        | +      |        |         |        |        |          |
| Whiting, King George         | 252,792 | 89,777 | 81,272 | 28,009 | 324,823 | 64,310 | 171,08 | 7 44,441 |
| Catch (Marine Invertebrates) |         |        |        |        |         |        |        |          |
| Calamari, Southern           | 22,616  | 7,046  | 4,092  | 2,555  | 162,804 | 31,357 | 124,67 | 3 33,890 |
| Cockle, Mud                  |         |        | 10,055 | 21,759 |         |        |        |          |
| Crab, Blue Swimmer           | 58,460  | 40,613 | +      |        | 88,668  | 31,516 | 288,19 | 5 86,816 |
| Crab, Sand                   | 1,235   | 921    |        |        |         |        |        |          |
| Cuttlefish                   | +       |        |        |        | +       |        | +      |          |
| Pipi                         | 72,752  | 53,944 | 3,961  | 3,813  |         |        |        |          |
| Razorfish                    | 82,106  | 52,015 | 2,702  | 2,725  |         |        |        |          |
| Rock Lobster, Southern       | +       |        | 1,946  | 1,962  |         |        |        |          |
| Scallop                      | +       |        | 1,243  | 1,254  |         |        | 7,018  | 6,891    |

### Appendix 23. Continued.

|                              | GSV     | 'KI    | NGS     | NGSV   |           | SE      |      |           |
|------------------------------|---------|--------|---------|--------|-----------|---------|------|-----------|
|                              | Number  | SE     | Number  | SE     | Number    | SE      | Num  | ber SE    |
| Catch (Marine Finfish)       |         |        |         |        |           |         |      |           |
| Bream, Black                 | 2,320   | 1,264  | 4,165   | 3,376  | 1,020     | 698     |      |           |
| Flathead                     | 4,326   | 2,138  | 5,497   | 3,918  | 1,536     | 1,072   | 3,48 | 36 2,742  |
| Flounder                     | +       |        | +       |        |           |         | +    |           |
| Garfish, Southern            | 75,984  | 33,837 | 20,921  | 8,489  | 3,989     | 2,327   | 20,9 | 07 16,693 |
| Herring, Australian          | 149,072 | 42,103 | 47,274  | 15,972 | 12,037    | 6,309   | 4,34 | 1,964     |
| Kingfish, Yellowtail         | +       |        |         |        | +         |         | +    |           |
| Leatherjacket                | 8,859   | 4,244  | 3,445   | 1,570  |           |         |      |           |
| Mackerel, Blue Slimy         | 2,758   | 1,523  | 15,709  | 11,055 | 3,307     | 2,553   |      |           |
| Mullet, Red (goatfish)       | 2,301   | 1,382  | 7,603   | 4,041  | +         |         | +    |           |
| Mullet, Sea                  | +       |        | 2,355   | 2,152  | 3,168     | 2,844   | 5,43 | 75 4,853  |
| Mullet, Yelloweye            | 35,025  | 17,761 | +       |        | 6,329     | 3,470   | 8,1  | 52 5,078  |
| Mulloway                     | +       |        |         |        | +         |         | +    |           |
| Perch, Striped               | 14,429  | 12,583 | 5,650   | 3,250  |           |         | +    |           |
| Redfish, Bight               | 8,353   | 5,134  |         |        | 3,744     | 2,327   | 3,1  | 53 3,077  |
| Salmon, Western Australian   | 57,651  | 26,161 | 10,131  | 3,915  | 14,492    | 5,590   | 5,13 | 36 1,764  |
| Snapper                      | +       |        |         |        | +         |         | 4,8  | 63 3,735  |
| Snook                        | 18,419  | 9,201  | +       |        | +         |         | 2,44 | 8 2,417   |
| Sweep                        | 11,054  | 7,218  | +       |        | +         |         | 3,2  | 72 1,632  |
| Toadfish                     |         |        | +       |        |           |         |      |           |
| Trevally, Silver             | 3,787   | 3,263  |         |        | 15,897    | 12,841  | 2,0  | 00 1,463  |
| Tuna, Southern Bluefin       | +       |        |         |        | 1,371     | 824     | +    |           |
| Whiting, King George         | 151,557 | 42,069 | 118,160 | 48,232 | 6,206     | 3,848   | 23,6 | 76 7,534  |
| Catch (Marine Invertebrates) |         |        |         |        |           |         |      |           |
| Calamari, Southern           | 139,213 | 40,577 | 82,715  | 22,808 | 2,422     | 1,446   | 11,6 | 45 3,636  |
| Cockle, Mud                  |         |        | 83,429  | 56,320 |           |         |      |           |
| Crab, Blue Swimmer           | 141,343 | 46,431 | 332,278 | 54,939 | 8,999     | 7,087   | 1,23 | 82 874    |
| Crab, Sand                   | 2,151   | 1,202  | 3,133   | 1,885  |           |         | +    |           |
| Cuttlefish                   | 1,011   | 807    |         |        |           |         | +    |           |
| Pipi                         |         |        |         |        | 1,043,514 | 610,659 | 28,7 | 90 21,334 |
| Razorfish                    |         |        | 10,353  | 7,667  |           |         |      |           |
| Rock Lobster, Southern       | 2,794   | 2,746  |         |        | +         |         | 74,6 | 24 21,011 |
| Scallop                      | 8,067   | 5,115  |         |        | +         |         |      |           |
# Appendix 23. Continued.

|                            | Coorong | I       | Lakes   |        | Lower Mu. |        |  |
|----------------------------|---------|---------|---------|--------|-----------|--------|--|
|                            | Number  | SE      | Number  | SE     | Number    | SE     |  |
| Catch (Marine Finfish)     |         |         |         |        |           |        |  |
| Herring, Australian        | +       |         |         |        |           |        |  |
| Salmon, Western Australian | 4,763   | 4,328   |         |        |           |        |  |
| Catch (Freshwater Species) |         |         |         |        |           |        |  |
| Carp                       | +       |         | 2,139   | 1,747  | 27,014    | 8,071  |  |
| Perch, golden (callop)     |         |         |         |        | +         |        |  |
| Perch, Redfin              |         |         |         |        | +         |        |  |
| Shrimp, Freshwater         |         |         |         |        | 18,355    | 13,201 |  |
| Yabbies, Freshwater        |         |         |         |        | 64,535    | 50,182 |  |
|                            | Mie     | d Mu.   | Uppe    | er Mu. | Inla      | nd     |  |
|                            | Number  | SE      | Number  | SE     | Number    | SE     |  |
| Catch (Freshwater Species) |         |         |         |        |           |        |  |
| Carp                       | 75,425  | 19,397  | 27,341  | 11,304 | 16,169    | 9,625  |  |
| Perch, golden (callop)     | 8,753   | 3,609   | 2,708   | 1,446  | +         |        |  |
| Perch, Redfin              | +       |         | +       |        | 39,209    | 17,850 |  |
| Shrimp, Freshwater         | 111,153 | 85,860  | 63,910  | 29,165 | +         |        |  |
| Yabbies, Freshwater        | 487,157 | 279,909 | 134,445 | 56,851 | 28,311    | 14,046 |  |

SA Recreational Fishing Survey 2021–22





SA Recreational Fishing Survey 2021–22

**Appendix 25.** Estimated number of persons and proportion of the South Australian resident population aged five years or older who fished recreationally in the 12 months prior to May 2000, prior to November 2007, prior to December 2013, and prior to March 2021. SE is standard error, RSE is relative standard error.\* Statistical regions were based on the Australian Standard Geographical Classification (ASGC) for 2000 and 2007 surveys; in 2013 the Australian Statistical Geography Standard (ASGS) was applied for regional demographic reporting

| Statistical regions*  | Population | Recreation | al Fishers |     | Participation |
|-----------------------|------------|------------|------------|-----|---------------|
| Ŭ                     | number     | Number     | SE         | RSE | %             |
| 2000                  |            |            |            |     |               |
| Adelaide              | 996,918    | 193,292    | 12,192     | 0.1 | 19%           |
| Outer Adelaide        | 100,949    | 29,733     | 1,958      | 0.1 | 29%           |
| Yorke and Lower North | 40,401     | 15,162     | 944        | 0.1 | 38%           |
| Murray Lands          | 62,015     | 22,728     | 1,294      | 0.1 | 37%           |
| South-East            | 56,525     | 18,775     | 1,203      | 0.1 | 33%           |
| Eyre                  | 29,987     | 14,603     | 720        | 0.0 | 49%           |
| Northern              | 72,918     | 23,822     | 1,448      | 0.1 | 33%           |
| 2007                  |            |            |            |     |               |
| Adelaide              | 1,071,235  | 147,075    | 8,218      | 0.1 | 14%           |
| Outer Adelaide        | 121,527    | 24,210     | 1,766      | 0.1 | 20%           |
| Yorke and Lower North | 42,630     | 12,252     | 920        | 0.1 | 29%           |
| Murray Lands          | 64,436     | 14,188     | 1,103      | 0.1 | 22%           |
| South-East            | 59,638     | 13,789     | 1,013      | 0.1 | 23%           |
| Eyre                  | 32,119     | 13,019     | 804        | 0.1 | 41%           |
| Northern              | 72,952     | 14,484     | 1,312      | 0.1 | 20%           |
| 2013                  |            |            |            |     |               |
| Adelaide              | 1,180,000* | 185,002    | NA         | NA  | 16%           |
| Outer Adelaide        | NA         | 26,321     | NA         | NA  | NA            |
| Yorke and Lower North | NA         | 11,279     | NA         | NA  | NA            |
| Murray Lands          | NA         | 12,781     | NA         | NA  | NA            |
| South-East            | NA         | 15,144     | NA         | NA  | NA            |
| Eyre                  | 49,000*    | 10,324     | NA         | NA  | 34%           |
| Northern              | NA         | 16,177     | NA         | NA  | NA            |
| 2021                  |            |            |            |     |               |
| Adelaide              | 1,177,845  | 228,557    | 9,800      | 0.0 | 19%           |
| Outer Adelaide        | 139,740    | 40,361     | 4,230      | 0.1 | 29%           |
| Yorke and Lower North | 44,266     | 15,466     | 1,720      | 0.1 | 35%           |
| Murray Lands          | 64,153     | 20,075     | 2,550      | 0.1 | 31%           |
| South-East            | 55,548     | 14,804     | 1,998      | 0.1 | 27%           |
| Eyre                  | 32,566     | 18,460     | 1,823      | 0.1 | 57%           |
| Northern              | 58,788     | 18,985     | 2,100      | 0.1 | 32%           |

\*Estimated based on participation rate

SA Recreational Fishing Survey 2021–22

**Appendix 26.** Annual recreational effort (number of fishers) by fishing region by survey, based on South Australian residents aged five years or older. SE is standard error.

| Fishing Pegion                                  | 2000–01 |        | 2007-   | -08   | 2020    | –21   |
|---|---------|--------|---------|-------|---------|-------|
| Fishing Region                                  | Number  | SE     | Number  | SE    | Number  | SE    |
| West Coast and Lower<br>Eyre Peninsula          | 48,788  | 6,154  | 29,705  | 3,299 | 43,598  | 4,042 |
| Spencer Gulf                                    | 136,168 | 9,375  | 93,367  | 5,997 | 108,077 | 5,867 |
| Gulf St Vincent/Kangaroo<br>Island              | 237,476 | 16,319 | 163,975 | 9,347 | 152,755 | 7,317 |
| South-East and Far<br>South-East                | 52,834  | 6,190  | 20,514  | 2,256 | 64,335  | 4,891 |
| Lower Lakes, Coorong<br>Lagoon and River Murray | 90,805  | 9,578  | 42,146  | 3,728 | 65,148  | 4,311 |
| Inland/Rest of SA                               | 35,189  | 5,614  | 9,410   | 1,972 | 19,389  | 3,651 |

**Appendix 27.** Annual recreational effort (fisher days) by fishing region by survey, based on South Australian residents aged five years or older. SE is standard error.

| Fishing Pagion                                  | 2000–01 |        | 2007-   | -08    | 2013–14 |    | 2020-   | -21    |
|---|---------|--------|---------|--------|---------|----|---------|--------|
|   | Number  | SE     | Number  | SE     | Number  | SE | Number  | SE     |
| West Coast and Lower Eyre Peninsula             | 229,609 | 45,939 | 117,121 | 14,075 | 155,455 | -  | 143,284 | 23,530 |
| Spencer Gulf                                    | 465,284 | 42,455 | 283,269 | 21,981 | 352,430 | -  | 317,901 | 30,691 |
| Gulf St Vincent/Kangaroo Island                 | 653,411 | 50,155 | 440,210 | 33,098 | 273,254 | -  | 439,547 | 59,758 |
| South-East and Far South-East                   | 180,472 | 22,011 | 83,232  | 10,342 | 57,934  | -  | 185,699 | 28,462 |
| Lower Lakes, Coorong Lagoon<br>and River Murray | 265,967 | 45,681 | 121,290 | 13,763 | 119,730 | -  | 188,475 | 30,910 |
| Inland/Rest of SA                               | 53,787  | 9,729  | 16,653  | 3,620  | 6,759   | -  | 35,627  | 7,767  |

| Appendix 28. Annual recreationa    | I catch (retained and released | l, by number) for key speci | ies by survey year, based on South |
|------------------------------------|--------------------------------|-----------------------------|------------------------------------|
| Australian residents aged five yea | irs or older.                  |                             |                                    |

| Species  | 2000–01   |         | 2007      | 2007–08 |           | -14     | 2021      | -22     |
|--|-----------|---------|-----------|---------|-----------|---------|-----------|---------|
| species  | Number    | SE      | Number    | SE      | Number    | SE      | Number    | SE      |
| Catch (Marine Finfish)                                 |           |         |           |         |           |         |           |         |
| Bream, Black   | 221,850   | 68,926  | 158,917   | 32,218  | 197,848   | 94,210  | 30,878    | 7,853   |
| Flathead   | 98,202    | 28,511  | 73,119    | 12,751  | 55,066    | 17,730  | 53,868    | 12,852  |
| Flounder   | 2,755     | 906     | 1,774     | 643     | 1,409     | 1,132   | 5,597     | 3,067   |
| Garfish, Southern                                      | 1,504,912 | 262,313 | 1,001,653 | 182,608 | 980,566   | 256,737 | 328,208   | 63,210  |
| Groper, Western Blue                                   | 130       | 231     | 1,847     | 830     | 344       | 328     | 291       | 277     |
| Herring, Australian                                    | 3,280,467 | 431,014 | 865,864   | 114,859 | 1,167,774 | 257,359 | 648,190   | 94,724  |
| Kingfish, Yellowtail                                   | 8,938     | 5,073   | 4,825     | 2,330   | 9,557     | 7,974   | 4,285     | 2,043   |
| Morwong, Blue  | 1,691     | 1,166   | 1,420     | 492     | 2,705     | 2,260   | 1,388     | 670     |
| Mullet, Yelloweye                                      | 573,381   | 148,741 | 263,940   | 49,187  | 100,876   | 27,860  | 69,657    | 21,612  |
| Mulloway   | 78,561    | 18,419  | 68,038    | 24,082  | 47,238    | 13,363  | 3,720     | 1,243   |
| Redfish, Bight (Nannygai, Red<br>Snapper, Swallowtail) | 68,783    | 15,747  | 38,751    | 13,796  | 41,285    | 23,642  | 38,073    | 11,431  |
| Salmon, Western Australian                             | 857,441   | 172,464 | 474,717   | 53,805  | 220,332   | 41,133  | 280,069   | 46,191  |
| Samsonfish   | 61        | 63      | 467       | 265     | 1,629     | 1,624   | 36        | 62      |
| Shark, Gummy   | 7,525     | 2,248   | 6,414     | 1,454   | 11,597    | 4,549   | 3,926     | 1,177   |
| Shark, School  | 540       | 395     | 2,084     | 626     | 7,749     | 5,596   | 1,232     | 696     |
| Snapper  | 332,978   | 61,583  | 384,077   | 60,264  | 437,329   | 166,107 | 59,129    | 13,038  |
| Snook  | 153,181   | 32,517  | 163,008   | 46,585  | 187,165   | 85,511  | 36,806    | 11,459  |
| Sweep  | 108,254   | 25,044  | 68,915    | 11,966  | 68,394    | 29,620  | 32,681    | 9,849   |
| Trevally, Silver                                       | 86,952    | 23,362  | 67,903    | 12,374  | 73,924    | 31,081  | 37,760    | 14,635  |
| Tuna, Southern Bluefin                                 | 6,165     | 3,502   | 5,413     | 2,982   | 16,261    | 7,719   | 4,197     | 1,697   |
| Whiting, King George                                   | 2,836,250 | 347,544 | 1,797,148 | 180,863 | 2,001,937 | 373,861 | 1,834,492 | 251,739 |
| Whiting, Yellowfin                                     | 325,982   | 134,819 | 99,179    | 24,312  | 286,133   | 137,509 | 200,090   | 91,629  |

# Appendix 28. Continued.

| Creation                     | 2000–01   |         | 2007      | 2007–08 |           | -14     | 2021      | 2021–22 |  |  |
|------------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|--|--|
| Species                      | Number    | SE      | Number    | SE      | Number    | SE      | Number    | SE      |  |  |
| Catch (Marine Invertebrates) |           |         |           |         |           |         |           |         |  |  |
| Abalone, Blacklip            | 9,586     | 4,663   | 1,907     | 752     | 282       | 280     | 3,296     | 2,836   |  |  |
| Abalone, Greenlip            | 16,379    | 12,984  | 4,689     | 1,710   | 4,651     | 1,893   | 4,706     | 2,325   |  |  |
| Calamari, Southern           | 967,878   | 217,971 | 492,736   | 68,023  | 480,016   | 111,883 | 573,808   | 71,712  |  |  |
| Cockle, Mud                  | 304,329   | 190,656 | 112,319   | 55,782  | 12,805    | 12,574  | 117,777   | 69,924  |  |  |
| Crab, Blue Swimmer           | 1,568,311 | 250,203 | 1,876,490 | 196,580 | 2,457,336 | 742,086 | 1,963,340 | 338,346 |  |  |
| Crab, Sand                   | 160,573   | 42,035  | 65,975    | 19,944  | 52,557    | 31,633  | 19,003    | 5,771   |  |  |
| Cuttlefish                   | 36,118    | 10,567  | 7,710     | 3,039   | 2,648     | 1,431   | 7,808     | 2,935   |  |  |
| Pipi                         | 1,237,758 | 721,670 | 312,479   | 159,300 | 1,076,368 | 808,357 | 1,704,036 | 724,350 |  |  |
| Razorfish                    | 347,031   | 90,085  | 148,593   | 37,957  | 72,676    | 34,963  | 95,162    | 52,661  |  |  |
| Rock Lobster, Southern       | 120,163   | 29,183  | 106,483   | 27,767  | 102,931   | 58,763  | 126,136   | 36,706  |  |  |
| Scallop                      | 56,242    | 43,741  | 107,333   | 43,466  | 249,669   | 153,880 | 20,244    | 11,137  |  |  |
| Catch (Freshwater Species)   |           |         |           |         |           |         |           |         |  |  |
| Bream, Bony                  | 698       | 646     | 197       | 190     | -         | -       | 212       | 204     |  |  |
| Carp                         | 469,416   | 74,552  | 130,928   | 29,027  | 223,750   | 50,848  | 149,511   | 27,039  |  |  |
| Catfish, Freshwater          | 4,265     | 2,080   | 2,350     | 908     | 20,538    | 7,131   | 2,715     | 1,095   |  |  |
| Cod, Murray                  | 1,938     | 934     | 1,853     | 863     | -         | -       | 2,435     | 927     |  |  |
| Perch, golden (callop)       | 249,107   | 44,309  | 91,530    | 18,811  | 116,153   | 31,256  | 24,220    | 7,498   |  |  |
| Perch, Redfin                | 92,648    | 33,441  | 7,161     | 1,774   | 7,464     | 5,150   | 42,833    | 18,100  |  |  |
| Perch, Silver                | 3,910     | 2,400   | 26,067    | 7,305   | 11,038    | 4,522   | 532       | 297     |  |  |
| Shrimp, Freshwater           | 1,509,813 | 356,751 | 10,131    | 8,755   | 141,994   | 77,462  | 281,608   | 126,640 |  |  |
| Yabby, Freshwater            | 822,051   | 176,316 | 61,535    | 28,020  | 271,237   | 179,738 | 946,905   | 341,597 |  |  |

**Appendix 29.** Annual recreational harvest (retained, by number) for key species by survey year, based on South Australian residents aged five years or older. SE is standard error; + indicates value <1000; values in bold indicate relative standard error >40%, values in italics indicate that fewer than 30 households recorded catches of the species/species group.

| Creation   | 2000–01   |         | 2007      | -08     | 2013      | -14     | 2021-     | 2021–22 |  |
|--|-----------|---------|-----------|---------|-----------|---------|-----------|---------|--|
| Species  | Number    | SE      | Number    | SE      | Number    | SE      | Number    | SE      |  |
| Harvest (Marine Finfish)                               |           |         |           |         |           |         |           |         |  |
| Bream, Black   | 82,007    | 34,401  | 19,971    | 4,511   | 16,979    | 6,985   | 7,505     | 3,671   |  |
| Flathead   | 57,077    | 15,920  | 38,873    | 6,944   | 17,794    | 4,645   | 26,620    | 5,961   |  |
| Flounder   | 2,551     | 887     | 1,249     | 565     | 1,318     | 1,136   | 2,400     | 1,429   |  |
| Garfish, Southern                                      | 1,305,275 | 223,120 | 807,743   | 148,110 | 870,147   | 239,053 | 264,506   | 51,926  |  |
| Groper, Western Blue                                   | 48        | 195     | 714       | 481     | -         | -       | 8         | 20      |  |
| Herring, Australian                                    | 2,535,404 | 345,198 | 598,774   | 77,706  | 1,014,374 | 226,701 | 452,010   | 69,165  |  |
| Kingfish, Yellowtail                                   | 6,551     | 4,842   | 3,925     | 2,113   | 7,764     | 7,094   | 2,004     | 947     |  |
| Morwong, Blue  | 1,691     | 1,167   | 1,150     | 395     | 2,705     | 2,260   | 1,197     | 530     |  |
| Mullet, Yelloweye                                      | 384,631   | 104,216 | 151,654   | 26,894  | 71,278    | 22,370  | 58,625    | 19,723  |  |
| Mulloway   | 24,933    | 8,316   | 10,171    | 3,173   | 9,883     | 4,537   | 1,886     | 843     |  |
| Redfish, Bight (Nannygai, Red<br>Snapper, Swallowtail) | 42,409    | 12,307  | 25,050    | 8,602   | 31,124    | 17,519  | 25,871    | 7,934   |  |
| Salmon, Western Australian                             | 643,886   | 135,045 | 303,307   | 36,681  | 148,361   | 30,520  | 154,613   | 30,431  |  |
| Samsonfish   | 61        | 63      | 467       | 265     | 1,629     | 1,624   | 10        | 22      |  |
| Shark, Gummy   | 3,876     | 1,220   | 4,443     | 1,144   | 8,822     | 3,690   | 2,567     | 770     |  |
| Shark, School  | 540       | 395     | 1,278     | 393     | 7,208     | 5,496   | 1,232     | 696     |  |
| Snapper  | 85,951    | 20,298  | 97,010    | 14,880  | 207,809   | 79,894  | 5,070     | 3,733   |  |
| Snook  | 142,737   | 31,326  | 121,663   | 34,083  | 174,224   | 83,340  | 34,877    | 10,748  |  |
| Sweep  | 56,226    | 11,548  | 32,979    | 6,319   | 29,555    | 10,705  | 18,482    | 7,716   |  |
| Trevally, Silver                                       | 60,297    | 14,368  | 39,889    | 7,746   | 57,140    | 26,265  | 33,104    | 14,403  |  |
| Tuna, Southern Bluefin                                 | 3,386     | 1,546   | 2,425     | 1,305   | 10,427    | 4,833   | 3,084     | 1,172   |  |
| Whiting, King George                                   | 2,068,549 | 271,897 | 1,249,079 | 132,304 | 1,467,601 | 253,416 | 1,129,574 | 137,808 |  |
| Whiting, Yellowfin                                     | 252,697   | 119,022 | 71,120    | 19,713  | 174,264   | 73,317  | 139,359   | 69,915  |  |

# Appendix 29. Continued.

| Creation                       | 2000      | -01     | 2007      | -08     | 2013      | -14     | 2021      | 2021–22 |  |
|--------------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|--|
| Species                        | Number    | SE      | Number    | SE      | Number    | SE      | Number    | SE      |  |
| Harvest (Marine Invertebrates) |           |         |           |         |           |         |           |         |  |
| Abalone, Blacklip              | 9,285     | 4,654   | 1,685     | 665     | 282       | 280     | 3,296     | 2,836   |  |
| Abalone, Greenlip              | 7,745     | 4,826   | 3,462     | 1,133   | 4,395     | 1,876   | 3,795     | 1,969   |  |
| Calamari, Southern             | 955,229   | 217,825 | 484,456   | 66,776  | 473,803   | 111,231 | 550,179   | 69,332  |  |
| Cockle, Mud                    | 304,329   | 190,656 | 91,994    | 40,863  | 12,805    | 12,574  | 93,484    | 60,377  |  |
| Crab, Blue Swimmer             | 1,055,101 | 174,739 | 1,144,837 | 137,117 | 1,423,794 | 415,730 | 920,721   | 121,102 |  |
| Crab, Sand                     | 74,656    | 25,010  | 28,634    | 12,858  | 27,277    | 21,655  | 6,687     | 2,421   |  |
| Cuttlefish                     | 29,111    | 8,126   | 6,159     | 2,931   | 1,431     | 973     | 2,518     | 1,060   |  |
| Pipi                           | 1,004,839 | 515,694 | 306,107   | 158,117 | 378,158   | 237,172 | 1,149,016 | 613,423 |  |
| Razorfish                      | 343,548   | 89,890  | 148,593   | 37,957  | 72,676    | 34,963  | 95,162    | 52,661  |  |
| Rock Lobster, Southern         | 85,776    | 21,635  | 47,875    | 10,373  | 62,346    | 39,085  | 80,950    | 21,306  |  |
| Scallop                        | 39,816    | 30,651  | 98,290    | 42,134  | 233,100   | 140,061 | 17,085    | 8,719   |  |
| Harvest (Freshwater Species)   |           |         |           |         |           |         |           |         |  |
| Bream, Bony                    | 169       | 391     | -         | -       | -         | -       | -         | -       |  |
| Carp                           | 453,511   | 72,228  | 129,012   | 28,973  | 205,882   | 48,495  | 148,812   | 26,958  |  |
| Catfish, Freshwater            | 822       | 680     | 259       | 255     | 794       | 562     | 329       | 319     |  |
| Cod, Murray                    | 1,012     | 728     | 507       | 495     | -         | -       | -         | -       |  |
| Perch, golden (callop)         | 89,001    | 14,115  | 39,861    | 8,177   | 37,367    | 10,019  | 12,721    | 3,973   |  |
| Perch, Redfin                  | 41,487    | 15,479  | 5,216     | 1,254   | 5,866     | 4,884   | 41,313    | 17,873  |  |
| Perch, Silver                  | 1,320     | 1,845   | 1,840     | 1,204   | 610       | 606     | 68        | 78      |  |
| Shrimp, Freshwater             | 1,266,783 | 277,795 | 8,143     | 7,089   | 47,409    | 28,363  | 194,108   | 91,431  |  |
| Yabby, Freshwater              | 739,326   | 168,764 | 46,565    | 24,436  | 58,977    | 26,028  | 714,447   | 289,232 |  |

|             | Motivation   | Ge          | Gender |         |             | Age |         |  |  |
|-------------|--|-------------|--------|---------|-------------|-----|---------|--|--|
| Category    | Statement  | Chi-squared | df     | p-value | Chi-squared | df  | p-value |  |  |
| Consume     | To catch fresh fish, lobsters etc.<br>for food             | 0.004       | 1      | 0.95    | 10.78       | 6   | 0.1     |  |  |
|             | To catch fish to share with<br>friends and family          | 2.99        | 1      | 0.08    | 4.31        | 6   | 0.64    |  |  |
| Environment | To be outdoors in the fresh air<br>to enjoy nature         | 0.02        | 1      | 0.88    | 6.56        | 6   | 0.36    |  |  |
| Relaxation  | To relax or unwind   | 0.33        | 1      | 0.57    | 5.07        | 6   | 0.54    |  |  |
|             | To be on your own to get<br>away from people               | 0.48        | 1      | 0.49    | 19.92       | 6   | 0.003   |  |  |
| Social      | To spend time with family                                  | 10.88       | 1      | <0.001  | 38.78       | 6   | <0.0001 |  |  |
|             | To spend time with other friends                           | 2.16        | 1      | 0.14    | 12.17       | 6   | 0.06    |  |  |
| Sport       | To compete in fishing<br>competitions                      | 0.64        | 1      | 0.43    | 7.63        | 6   | 0.27    |  |  |
|             | For the enjoyment or sport of<br>catching fish, crabs etc. | 1.25        | 1      | 0.26    | 6.41        | 6   | 0.38    |  |  |
|             | To catch a trophy fish                                     | 3.34        | 1      | 0.07    | 8.37        | 6   | 0.21    |  |  |

**Appendix 30.** Results of Kruskal-Wallis test for the effect of respondent grouping factors on the importance of motivation statements for recreational fishers. Bold p-values correspond to statistically significant factors (p < 0.05).

# Appendix 30. Continued.

|             | Motivation  | Avi         | Avidity |         | Water       | Waterbody |         |             |    | Residency |  |  |
|-------------|---|-------------|---------|---------|-------------|-----------|---------|-------------|----|-----------|--|--|
| Category    | Statement   | Chi-squared | df      | p-value | Chi-squared | df        | p-value | Chi-squared | df | p-value   |  |  |
| Consume     | To catch fresh fish,<br>lobsters etc. for food          | 31.74       | 5       | <0.0001 | 14.09       | 2         | <0.001  | 7.51        | 6  | 0.28      |  |  |
|             | To catch fish to share with<br>friends and family       | 17.28       | 5       | 0.004   | 22.34       | 2         | <0.0001 | 7.86        | 6  | 0.25      |  |  |
| Environment | To be outdoors in the fresh air to enjoy nature         | 7.93        | 5       | 0.16    | 1.87        | 2         | 0.39    | 4.56        | 6  | 0.6       |  |  |
| Relaxation  | To relax or unwind                                      | 9.29        | 5       | 0.1     | 0.34        | 2         | 0.84    | 8.92        | 6  | 0.18      |  |  |
|             | To be on your own to<br>get away from people            | 8.09        | 5       | 0.15    | 0.17        | 2         | 0.92    | 7.01        | 6  | 0.32      |  |  |
| Social      | To spend time with family                               | 6.78        | 5       | 0.24    | 3.23        | 2         | 0.20    | 4.52        | 6  | 0.61      |  |  |
|             | To spend time with other friends                        | 13.55       | 5       | 0.02    | 3.38        | 2         | 0.18    | 2.45        | 6  | 0.87      |  |  |
| Sport       | To compete in fishing<br>competitions                   | 3.19        | 5       | 0.67    | 3.3         | 2         | 0.19    | 14.53       | 6  | 0.02      |  |  |
|             | For the enjoyment or sport of catching fish, crabs etc. | 18.92       | 5       | 0.002   | 0.26        | 2         | 0.88    | 1.44        | 6  | 0.96      |  |  |
|             | To catch a trophy fish                                  | 11.81       | 5       | 0.04    | 6.7         | 2         | 0.04    | 12.51       | 6  | 0.05      |  |  |

| Appendix 31. Results of Kruskal-Wallis t  | est for the effect of respondent groups of the second second second second second second second second second s | ouping factors on the im   | portance of consumptive orientation |
|---|---|----------------------------|-------------------------------------|
| statements for recreational fishers. Bold | p-values correspond to statisticall   | y significant factors (p < | < 0.05).                            |

|                        | Ger   | nder        |    | Age     |             |    |         |  |
|------------------------|---|-------------|----|---------|-------------|----|---------|--|
| Category               | Statement   | Chi-squared | df | p-value | Chi-squared | df | p-value |  |
| Catch variety          | I like to fish where there are several kinds of fish to catch         | 12.08       | 1  | <0.001  | 1.07        | 6  | 0.98    |  |
| Catching<br>large fish | I prefer to fish where I know I may catch<br>a very large trophy fish | 1.55        | 1  | 0.21    | 35.57       | 6  | <0.0001 |  |
|                        | l'd rather catch one or two bigger fish<br>than ten smaller fish      | 4.46        | 1  | 0.03    | 14.06       | 6  | 0.03    |  |
|                        | I'm happiest with the fishing trip if I catch a challenging game fish | 8.68        | 1  | 0.003   | 26.63       | 6  | <0.001  |  |
|                        | The bigger the fish I catch the better the fishing trip               | 4.13        | 1  | 0.04    | 13.45       | 6  | 0.04    |  |

# Appendix 31. Continued

| Consumptive orientation |   | Avidity         |    |         | Water       | y  | Residency |             |    |             |
|-------------------------|---|-----------------|----|---------|-------------|----|-----------|-------------|----|-------------|
| Category                | Statement   | Chi-<br>squared | df | p-value | Chi-squared | df | p-value   | Chi-squared | df | p-<br>value |
| Catch<br>variety        | I like to fish where there are<br>several kinds of fish to catch      | 12.93           | 5  | 0.02    | 2.92        | 2  | 0.23      | 5.43        | 6  | 0.49        |
| Catching<br>large fish  | I prefer to fish where I know I may catch a very large trophy fish    | 15.69           | 5  | 0.01    | 1.41        | 2  | 0.49      | 4.33        | 6  | 0.63        |
|                         | I'd rather catch one or two bigger<br>fish than ten smaller fish      | 2.25            | 5  | 0.81    | 1.86        | 2  | 0.39      | 4.76        | 6  | 0.57        |
|                         | I'm happiest with the fishing trip if I catch a challenging game fish | 3.24            | 5  | 0.66    | 4.89        | 2  | 0.09      | 5.19        | 6  | 0.52        |
|                         | The bigger the fish I catch the<br>better the fishing trip            | 3.49            | 5  | 0.63    | 1.37        | 2  | 0.5       | 14.11       | 6  | 0.03        |

# Appendix 31. Continued.

| Cons                     | Gen   | der         |    | Age     |             |    |         |  |
|--------------------------|---|-------------|----|---------|-------------|----|---------|--|
| Category                 | Statement   | Chi-squared | df | p-value | Chi-squared | df | p-value |  |
| Catching numbers of fish | 'Bagging out' is the best indicator of a good fishing trip                    | 9.34        | 1  | 0.002   | 6.39        | 6  | 0.38    |  |
|                          | I want to keep all the fish I catch   | 0.38        | 1  | 0.54    | 4.5         | 6  | 0.61    |  |
|                          | The more fish I catch the happier<br>I am                                     | 0.07        | 1  | 0.79    | 4.01        | 6  | 0.68    |  |
| Catching something       | A fishing trip can still be<br>successful, even if no fish are<br>caught      | 0.73        | 1  | 0.39    | 7.36        | 6  | 0.29    |  |
|                          | If I thought I wouldn't catch any<br>fish on a trip, I wouldn't go fishing    | 8.58        | 1  | 0.003   | 5.82        | 6  | 0.44    |  |
|                          | I'm not satisfied unless I catch at<br>least something                        | 0.21        | 1  | 0.65    | 3.94        | 6  | 0.68    |  |
| Consume catch            | I usually eat the fish I catch  | 1.9         | 1  | 0.17    | 15.88       | 6  | 0.01    |  |
| Retaining fish           | I would rather keep just enough<br>fish for a feed than take the bag<br>limit | 0.71        | 1  | 0.4     | 5.7         | 6  | 0.46    |  |
|                          | I'm just as happy if I don't keep<br>the fish I catch                         | 2.15        | 1  | 0.14    | 8.45        | 6  | 0.21    |  |

# Appendix 31. Continued.

| Consumptive orientation        |   | Avidity     |    |         | Water       | у  | Residency |             |    |         |
|--------------------------------|---|-------------|----|---------|-------------|----|-----------|-------------|----|---------|
| Category                       | Statement   | Chi-squared | df | p-value | Chi-squared | df | p-value   | Chi-squared | df | p-value |
| Catching<br>numbers of<br>fish | 'Bagging out' is the best<br>indicator of a good<br>fishing trip              | 2.6         | 5  | 0.76    | 8.7         | 2  | 0.01      | 8.91        | 6  | 0.18    |
|                                | I want to keep all the fish<br>I catch  | 15.01       | 5  | 0.01    | 2.07        | 2  | 0.36      | 9.55        | 6  | 0.15    |
|                                | The more fish I catch the<br>happier I am                                     | 1.14        | 5  | 0.95    | 8.45        | 2  | 0.01      | 4.59        | 6  | 0.6     |
| Catching something             | A fishing trip can still be<br>successful, even if no<br>fish are caught      | 5.25        | 5  | 0.39    | 0.45        | 2  | 0.8       | 1.86        | 6  | 0.93    |
|                                | If I thought I wouldn't<br>catch any fish on a trip, I<br>wouldn't go fishing | 7.65        | 5  | 0.18    | 8.94        | 2  | 0.01      | 7.94        | 6  | 0.24    |
|                                | I'm not satisfied unless I<br>catch at least something                        | 16.02       | 5  | 0.01    | 8.22        | 2  | 0.02      | 5.23        | 6  | 0.51    |
| Consume<br>catch               | l usually eat the fish l<br>catch   | 17.29       | 5  | 0.004   | 19.63       | 2  | <0.0001   | 14.76       | 6  | 0.02    |
| Retaining fish                 | I would rather keep just<br>enough fish for a feed<br>than take the bag limit | 3.46        | 5  | 0.63    | 2.49        | 2  | 0.29      | 7.51        | 6  | 0.28    |
|                                | I'm just as happy if I<br>don't keep the fish I<br>catch                      | 14.51       | 5  | 0.01    | 1.68        | 2  | 0.43      | 8.2         | 6  | 0.22    |