



12-2019

## Statewide survey of boat-based recreational fishing in Western Australia 2017/18

K. L. Ryan

N.G. Hall

E.K. Lai

Claire B. Smallwood

Alissa Tate

*See next page for additional authors*

Follow this and additional works at: [https://library.dpird.wa.gov.au/fr\\_rr](https://library.dpird.wa.gov.au/fr_rr)

 Part of the [Aquaculture and Fisheries Commons](#)

---

### Recommended Citation

Ryan KL, Hall NG, Lai EK, Smallwood CB, Tate A, Taylor SM, Wise BS 2019. Statewide survey of boat-based recreational fishing in Western Australia 2017/18. Fisheries Research Report No. 297, Department of Primary Industries and Regional Development, Western Australia. 195pp.

This report is brought to you for free and open access by the Fishing & aquaculture at Digital Library. It has been accepted for inclusion in Fisheries research reports by an authorized administrator of Digital Library. For more information, please contact [library@dpird.wa.gov.au](mailto:library@dpird.wa.gov.au).

---

## Authors

K. L. Ryan, N.G. Hall, E.K. Lai, Claire B. Smallwood, Alissa Tate, S.M Taylor, and Brent S. Wise



Department of  
**Primary Industries and  
Regional Development**

## **Fisheries Research Report No. 297**

# **Statewide survey of boat-based recreational fishing in Western Australia 2017/18**

K.L. Ryan, N.G. Hall, E.K. Lai, C.B. Smallwood,  
A. Tate, S.M. Taylor, B.S. Wise

December 2019

**Correct citation:**

Ryan KL, Hall NG, Lai EK, Smallwood CB, Tate A, Taylor SM, Wise BS 2019. Statewide survey of boat-based recreational fishing in Western Australia 2017/18. Fisheries Research Report No. 297, Department of Primary Industries and Regional Development, Western Australia. 195pp.

**Enquiries:**

WA Fisheries and Marine Research Laboratories, PO Box 20, North Beach, WA 6920  
Tel: +61 8 9203 0111  
Email: [library@fish.wa.gov.au](mailto:library@fish.wa.gov.au)  
Website: [www.fish.wa.gov.au](http://www.fish.wa.gov.au)

A complete list of Fisheries Research Reports is available online at **[www.fish.wa.gov.au](http://www.fish.wa.gov.au)**

Fish Illustrations © R.Swainston/[www.anima.net.au](http://www.anima.net.au).

**Important disclaimer**

The Chief Executive Officer of the Department of Primary Industries and Regional Development and the State of Western Australia accept no liability whatsoever by reason of negligence or otherwise arising from the use or release of this information or any part of it.

Department of Primary Industries and Regional Development  
Gordon Stephenson House  
140 William Street  
PERTH WA 6000  
Telephone: (08) 6551 4444  
Website: [dpird.wa.gov.au](http://dpird.wa.gov.au)  
ABN: 18 951 343 745

ISSN: 1035-4549 (Print)      ISBN: 978-1-921258-32-9 (Print)  
ISSN: 2202-5758 (Online)      ISBN: 978-1-921258-33-6 (Online)

Copyright © State of Western Australia (Department of Primary Industries and Regional Development) 2019.



# Table of Contents

<b>Executive Summary .....</b>	<b>ix</b>
<b>1 Introduction .....</b>	<b>1</b>
1.1 Importance of Recreational Fishing in Western Australia .....	1
1.2 Need for Recreational Fishing Information.....	1
1.3 Recreational Fishing Surveys in Australia .....	2
1.4 Recreational Fishing Surveys in Western Australia .....	3
1.5 Statewide Survey of Boat-Based Recreational Fishing.....	4
1.6 Survey Objectives.....	4
1.7 Report Structure .....	4
<b>2 Survey Design and Analysis .....</b>	<b>6</b>
2.1 Survey Scope.....	6
2.1.1 Who Was Included In The Survey? .....	6
2.1.2 What Fishing Activities Were Covered?.....	7
2.1.3 What Species Were Covered? .....	7
2.1.4 Survey Area .....	8
2.1.5 Survey Duration .....	8
2.1.6 Survey Data Elements .....	8
2.2 Survey Components .....	11
2.2.1 Phone Surveys .....	11
2.2.2 Boat Ramp Surveys .....	19
2.2.3 Remote Camera Surveys .....	20
2.3 Phone-Diary Survey Expansion, Weighting and Analysis .....	20
2.4 Uncertainty .....	22
2.5 Reporting Notes.....	22
<b>3 Participation.....</b>	<b>24</b>
3.1 Fishing Participation.....	24
3.2 Kimberley .....	26
3.3 Pilbara .....	27
3.4 Gascoyne .....	28
3.5 Mid West.....	29

3.6	Wheatbelt.....	30
3.7	Perth Metropolitan .....	31
3.8	Peel.....	32
3.9	South West.....	33
3.10	Great Southern .....	34
3.11	Goldfields-Esperance.....	35
3.12	Interstate.....	36
4	Fishing Effort.....	37
4.1	Statewide .....	39
4.2	North Coast.....	40
4.3	Gascoyne Coast .....	41
4.4	West Coast .....	42
4.5	South Coast.....	43
5	Statewide Estimates of Recreational Catch .....	44
5.1	Annual Catch (Total, Kept and Released Numbers) .....	44
5.2	Release Rates .....	44
5.3	Reasons for Release.....	45
6	Estimates of Catch for Key Species .....	58
6.1	Estuarine .....	60
6.1.1	Barramundi ( <i>Lates calcarifer</i> ).....	60
6.1.2	Black Bream ( <i>Acanthopagrus butcheri</i> ).....	61
6.1.3	Estuary Cobbler ( <i>Cnidoglanis macrocephalus</i> ) .....	62
6.1.4	Southern Bluespotted Flathead ( <i>Platycephalus speculator</i> ) .....	63
6.1.5	Yellowtail Flathead ( <i>Platycephalus westraliae</i> ) .....	64
6.2	Nearshore.....	65
6.2.1	Australian Herring ( <i>Arripis georgianus</i> ).....	65
6.2.2	Western Australian Salmon ( <i>Arripis truttaceus</i> ).....	66
6.2.3	Western Yellowfin Bream ( <i>Acanthopagrus morrisoni</i> ).....	67
6.2.4	Chinaman Rockcod ( <i>Epinephelus rivulatus</i> ).....	68
6.2.5	Grunters ( <i>Pelsartia humeralis</i> and <i>Pelates octolineatus</i> ).....	69
6.2.6	Garfish ( <i>Hyporhamphus melanochir</i> and <i>Hemiramphus robustus</i> ) .....	70
6.2.7	Leatherjacket (Family Monacanthidae).....	71
6.2.8	Mullet (Family Mugilidae) .....	72

6.2.9	Tailor ( <i>Pomatomus saltatrix</i> ) .....	73
6.2.10	Western Butterfish ( <i>Pentapodus vitta</i> ) .....	74
6.2.11	Blue Threadfin ( <i>Eleutheronema tetradactylum</i> ) .....	75
6.2.12	King Threadfin ( <i>Polydactylus macrochir</i> ) .....	76
6.2.13	Giant Trevally ( <i>Caranx ignobilis</i> ) .....	77
6.2.14	Golden Trevally ( <i>Gnathanodon speciosus</i> ) .....	78
6.2.15	Silver Trevally ( <i>Pseudocaranx</i> spp. complex) .....	79
6.2.16	Yellowtail Scad ( <i>Trachurus novaezelandiae</i> ) .....	80
6.2.17	Mangrove Jack ( <i>Lutjanus argentimaculatus</i> ) .....	81
6.2.18	Blue Mackerel ( <i>Scomber australasicus</i> ) .....	82
6.2.19	Brownspotted Wrasse ( <i>Notolabrus parilus</i> ) .....	83
6.2.20	Southern Maori Wrasse ( <i>Ophthalmolepis lineolatus</i> ) .....	84
6.2.21	Western King Wrasse ( <i>Coris auricularis</i> ) .....	85
6.2.22	King George Whiting ( <i>Sillaginodes punctatus</i> ) .....	86
6.2.23	School Whiting ( <i>Sillago bassensis</i> , <i>vittata</i> and <i>schomburgkii</i> ) .....	87
<b>6.3</b>	<b>Inshore Demersal .....</b>	<b>88</b>
6.3.1	Pink Snapper ( <i>Chrysophrys auratus</i> ) .....	88
6.3.2	Bluespotted Emperor ( <i>Lethrinus punctulatus</i> ) .....	89
6.3.3	Grass Emperor ( <i>Lethrinus laticaudis</i> ) .....	90
6.3.4	Redthroat Emperor ( <i>Lethrinus miniatus</i> ) .....	91
6.3.5	Spangled Emperor ( <i>Lethrinus nebulosus</i> ) .....	92
6.3.6	Blackspotted Rockcod ( <i>Epinephelus malabaricus</i> ) .....	93
6.3.7	Breaksea Cod ( <i>Epinephelides armatus</i> ) .....	94
6.3.8	Coral Trout ( <i>Plectropomus maculatus</i> and <i>P. leopardus</i> ) .....	95
6.3.9	Goldspotted Rockcod ( <i>Epinephelus coioides</i> ) .....	96
6.3.10	Harlequin Fish ( <i>Othos dentex</i> ) .....	97
6.3.11	Rankin Cod ( <i>Epinephelus multinotatus</i> ) .....	98
6.3.12	Painted Sweetlips ( <i>Diagramma labiosum</i> ) .....	99
6.3.13	Sergeant Baker ( <i>Aulopus purpurissatus</i> ) .....	100
6.3.14	Blue Morwong ( <i>Nemadactylus valenciennesi</i> ) .....	101
6.3.15	West Australian Dhufish ( <i>Glaucosoma hebraicum</i> ) .....	102
6.3.16	Bight Redfish ( <i>Centroberyx gerrardi</i> ) .....	103
6.3.17	Swallowtail ( <i>Centroberyx lineatus</i> ) .....	104
6.3.18	Sea Sweep ( <i>Scorpiis aequipinnis</i> ) .....	105
6.3.19	Crimson Snapper ( <i>Lutjanus erythropterus</i> ) .....	106
6.3.20	Goldband Snapper ( <i>Pristipomoides multidens</i> ) .....	107
6.3.21	Red Emperor ( <i>Lutjanus sebae</i> ) .....	108
6.3.22	Stripey Snapper ( <i>Lutjanus carponotatus</i> ) .....	109
6.3.23	Baldchin Groper ( <i>Choerodon rubescens</i> ) .....	110

6.3.24	Blackspot Tuskfish ( <i>Choerodon schoenleinii</i> ) .....	111
6.3.25	Blue Tuskfish ( <i>Choerodon cyanodus</i> ).....	112
6.3.26	Foxfish ( <i>Bodianus frenchii</i> ).....	113
<b>6.4</b>	<b>Offshore Demersal .....</b>	<b>114</b>
6.4.1	Eightbar Grouper ( <i>Hyporthodus octofasciatus</i> ) .....	114
6.4.2	Ruby Snapper ( <i>Etelis carbunculus</i> ).....	115
6.4.3	Hapuku ( <i>Polyprion oxygeneios</i> ) .....	116
<b>6.5</b>	<b>Pelagic .....</b>	<b>117</b>
6.5.1	Billfish (Family Istiophoridae) .....	117
6.5.2	Cobia ( <i>Rachycentron canadum</i> ) .....	118
6.5.3	Samsonfish ( <i>Seriola hippos</i> ) .....	119
6.5.4	Yellowtail Kingfish ( <i>Seriola lalandi</i> ).....	120
6.5.5	Grey Mackerel ( <i>Scomberomorus semifasciatus</i> ).....	121
6.5.6	School Mackerel ( <i>Scomberomorus queenslandicus</i> ) .....	122
6.5.7	Shark Mackerel ( <i>Grammatorcynus bicarinatus</i> ).....	123
6.5.8	Spanish Mackerel ( <i>Scomberomorus commerson</i> ) .....	124
6.5.9	Mackerel Tuna ( <i>Euthynnus affinis</i> ) .....	125
6.5.10	Southern Bluefin Tuna ( <i>Thunnus maccoyii</i> ) .....	126
6.5.11	Yellowfin Tuna ( <i>Thunnus albacares</i> ) .....	127
<b>6.6</b>	<b>Sharks.....</b>	<b>128</b>
6.6.1	Gummy Sharks ( <i>Mustelus antarcticus</i> and <i>M. stevensi</i> ) .....	128
6.6.2	Port Jackson Shark ( <i>Heterodontus portusjacksoni</i> ) .....	129
6.6.3	Whaler Sharks (Family Carcharhinidae) .....	130
6.6.4	Wobbeong (Family Orectolobidae).....	131
<b>6.7</b>	<b>Crustaceans.....</b>	<b>132</b>
6.7.1	Western Rock Lobster ( <i>Panulirus cygnus</i> ) .....	132
6.7.2	Blue Swimmer Crab ( <i>Portunus armatus</i> ).....	133
6.7.3	Mud Crab ( <i>Scylla olivacea</i> and <i>S. serrata</i> ). .....	134
<b>6.8</b>	<b>Molluscs.....</b>	<b>135</b>
6.8.1	Abalone ( <i>Haliotis</i> spp.) .....	135
<b>6.9</b>	<b>Cephalopods .....</b>	<b>136</b>
6.9.1	Cuttlefish (Order Sepiidae) .....	136
6.9.2	Squid (Order Teuthoidea).....	137
6.9.3	Octopus (Order Octopodidae) .....	138
<b>7</b>	<b>Estimates of Catch by Bioregion.....</b>	<b>139</b>
<b>7.1</b>	<b>North Coast.....</b>	<b>139</b>

7.2	Gascoyne Coast .....	139
7.3	West Coast .....	139
7.4	South Coast.....	139
8	Estimates of Catch by Zones within Bioregions .....	158
8.1	Kimberley .....	158
8.2	Pilbara .....	158
8.3	Ningaloo .....	158
8.4	Carnarvon/Shark Bay.....	159
8.5	Mid West.....	159
8.6	Metropolitan .....	159
8.7	South West.....	159
8.8	Albany .....	160
8.9	Esperance.....	160
9	Harvest Weights .....	171
9.1	Nearshore and Estuarine Resources .....	171
9.2	Demersal Resources .....	173
9.3	Pelagic Resources .....	177
9.4	Crab Resources .....	178
9.5	Summary .....	179
10	Summary and Future Research .....	182
10.1	Overview .....	182
10.2	Fine-scale Estimates .....	185
10.3	Validation of Estimates from On-Site Surveys .....	185
10.4	Improving Accuracy and Precision of Estimates.....	186
11	Acknowledgements.....	188
12	References .....	189
	Appendix: Estimates of average weight of key species from Boat Ramp Surveys in the West Coast Bioregion in 17/18. ....	193



## Executive Summary

The statewide survey of boat-based recreational fishing includes three components: (i) off-site Phone Surveys (encompassing an initial Screening Survey, a longitudinal Phone-Diary Survey, and Post-Enumeration Surveys); (ii) on-site Boat Ramp Surveys; and (iii) Remote Camera Surveys. The main data collection period was the 12-months from September 2017 to August 2018 inclusive, with the Post-Enumeration Surveys occurring from September to December 2018. This report presents results from the statewide survey in 2017/18 and provides comparisons with the previous statewide surveys in 2015/16 (September 2015 to August 2016), 2013/14 (May 2013 to April 2014) and 2011/12 (March 2011 to February 2012).

A total of 2,989 fishers completed the Phone-Diary Survey with 92,449 individual fish (including invertebrates) caught (kept or released) during the 12-month survey by those fishers who participated in the survey. Fishing activity reported by fishers during the survey included 13,423 boat days, 14,234 fishing events and 39,285 fishing hours, across every day of the survey year and the majority of the State's coastline. Additionally, 2,773 fishers were interviewed in Boat Ramp Surveys with 7,352 individual fish (or invertebrates) measured.

A diverse range of species/taxa were caught, including scalefish (186 species/taxa), elasmobranchs (18), crustaceans (7) and molluscs (5). An estimated 2.82 million individual fish (including invertebrates) were caught from boat-based recreational fishing in 2017/18. A similar proportion of the catch was either kept (1.52 million or 54%) or released (1.30 million or 46%). Approximately half of the total catch were finfish (1.32 million scalefish or elasmobranchs; 47%) in comparison to invertebrates (1.50 million crustaceans or molluscs; 53%). A similar proportion of finfish (49%) and invertebrates (44%) were released.

School Whiting (*Sillago bassensis*, *S. vittata* and *S. schomburgkii*) were the most commonly caught finfish species statewide with an estimated 259,359 kept or released statewide by number, or 19% of the finfish catch, followed by Australian Herring (*Arripis georgianus*; 119,545 or 9%), Pink Snapper (*Chrysophrys auratus*; 116,091 or 9%), West Australian Dhufish (*Glaucosoma hebraicum*; 67,842 or 5%), King George Whiting (*Sillaginodes punctata*; 52,649 or 4%), Silver Trevally (*Pseudocaranx* spp. complex; 45,913 or 3%), Grass Emperor (*Lethrinus laticaudis*; 36,996 or 3%), Western King Wrasse (*Coris auricularis*; 35,413 or 3%), Black Bream (*Acanthopagrus butcheri*; 31,599 or 2%), Brownspotted Wrasse (*Notolabrus parilus*; 26,084 or 2%), Baldchin Groper (*Choerodon rubescens*; 25,669 or 2%) and Breaksea Cod (*Epinephelides armatus*; 25,471 or 2%). High release rates were observed for many of these species, including Brownspotted Wrasse (85%), Western King Wrasse (85%), Black Bream (80%), Pink Snapper (73%), Grass Emperor (63%) and West Australian Dhufish (59%). Release rates were lower for Silver Trevally (44%), Breaksea Cod (38%), Baldchin Groper (35%), School Whiting (24%), Australian Herring (21%) and King George Whiting (20%).

Western Rock Lobster (*Panulirus cygnus*) and Blue Swimmer Crab (*Portunus armatus*) were the most commonly caught invertebrate species by boat-based recreational fishers. Western Rock Lobster was the most commonly caught (695,433 kept or released statewide by number, or 47% of the invertebrate catch), followed by Blue Swimmer Crab (666,526 or 45%) and Squid (Order Teuthoidea; 88,519 or 6%). High release rates were observed for Blue Swimmer

Crab (58%) compared with Western Rock Lobster (35%) and Squid (3%). These estimates exclude catches from boat-based recreational fishers that only held a Rock Lobster licence and shore-based recreational fishers.

Estimates of catch (by number) were converted to estimates of harvest (by weight) using average weight information collected for key species, obtained from Boat Ramp Surveys or Tour Operator Returns (Charter Logbooks). An overview of the information required for stock status reporting of major recreational fisheries, based on estimates of harvest and 95% confidence intervals during 2017/18, is provided in this report. At a statewide level, estimates of catch from boat-based recreational fishing were generally consistent across the four statewide surveys. At a bioregion level, comparisons can be made for both the species contributing to the top 10 species in each resource and the estimated harvest for each resource.

The top 10 nearshore and estuarine species (or species groupings) in 2017/18 represented: 87% of the total catch (kept by numbers) in the North Coast, 94% in the Gascoyne Coast, 95% in the West Coast and 95% in the South Coast. The estimated recreational harvest ranges for the top 10 nearshore and estuarine species: in the North Coast were steady at 20 t (95% CI 15–26 t) in 2017/18 compared with 21 t (95% CI 15–28) in 2015/16, 14 t (95% CI 10–18) in 2013/14 and 19 t (95% CI 13–25) in 2011/12; in the Gascoyne Coast were steady at 11 t (95% CI 7–15 t) in 2017/18 compared with 6 t (95% CI 4–9) in 2015/16, 14 t (95% CI 8–20) in 2013/14 and 11 t (95% CI 8–14) in 2011/12; in the West Coast were steady at 56 t (95% CI 49–64 t) in 2017/18 compared with 65 t (95% CI 57–73) in 2015/16, but lower than 76 t (95% CI 67–85) in 2013/14 and 114 t (95% CI 101–126) in 2011/12; and in the South Coast were steady at 26 t (95% CI 17–35 t) in 2017/18 compared with 17 t (95% CI 13–21) in 2015/16, 25 t (95% CI 20–30) in 2013/14, but lower than 44 t (95% CI 37–52) in 2011/12.

The top 10 demersal species (or species groupings, 15 in the West Coast) in 2017/18 represented: 79% of the total catch (kept by numbers) in the North Coast, 81% in the Gascoyne Coast, 90% in the West Coast and 99% in the South Coast.

The estimated recreational harvest range for the top 10 demersal species (or groupings) in the North Coast was higher at 75 t (95% CI 63–88 t) in 2017/18 compared with 40 t (95% CI 34–46 t) in 2015/16, but steady with 55 t (95% CI 46–65) in 2013/14 and 78 t (95% CI 69–87) in 2011/12. This decrease was consistent with steady estimates of effort by boat-based recreational fishers in the North Coast in 2017/18 compared with 2015/16. Estimated recreational harvests in 2017/18 were higher for: Coral Trout (9–16 95% CI) compared with 2015/16 (4–7), but steady with 2013/14 (5–10) and 2011/12 (8–15); Rankin Cod (8–22) compared with 2015/16 (3–7), but steady with 2013/14 (4–9) and 2011/12 (6–10); and Red Emperor (9–21) compared with 2015/16 (3–9), but steady with 2013/14 (4–10) and 2011/12 (7–12). Estimated recreational harvests were steady for Grass Emperor, Blackspot Tuskfish, Blue Tuskfish, Spangled Emperor, Stripec Snapper and Mangrove Jack.

The estimated recreational harvest range for the top 10 demersal species (or groupings) in the Gascoyne Coast were steady at 96 t (95% CI 82–110) in 2017/18 compared with 99 t (95% CI 85–114) in 2015/16, 98 t (95% CI 85–111) in 2013/14, but lower 144 t (95% CI 125–160) in 2011/12. Estimated recreational harvests were steady for Pink Snapper, Spangled Emperor,



Goldband Snapper, Rankin Cod, Red Emperor, Grass Emperor, Redthroat Emperor, Coral Trout, Baldchin Groper and Stripey Snapper in the Gascoyne Coast.

The estimated recreational harvest range for the top 15 demersal species (or groupings) in the West Coast were steady at 231 t (95% CI 210–253) in 2017/18 compared with 213 t (95% CI 194–231) in 2015/16, but higher than 154 t (95% CI 140–168) in 2013/14 and 160 t (95% CI 145–174) in 2011/12. The estimated recreational harvest range of West Australian Dhufish was steady in 2017/18 (105–141) compared with 2015/16 (97–129), and higher than 2013/14 (69–94) and 2011/12 (64–87). The estimated recreational harvest range of Baldchin Groper was steady in 2017/18 (26–38) compared with 2015/16 (28–42), and higher than 2013/14 (17–25) and 2011/12 (24–36). The estimated recreational harvest range of Pink Snapper was steady in 2017/18 (40–55) compared with 2015/16 (30–42), and higher than 2013/14 (25–36) and 2011/12 (27–38). Estimated recreational harvests were also steady for Breaksea Cod, Emperor, Bass Groper, Blue Morwong, Hapuku, Bight Redfish, Sergeant Baker, Blue-Eye Trevalla, Foxfish, Eightbar Grouper and Sea Sweep in the West Coast.

The estimated recreational harvest range for the top 10 demersal species (or groupings) in the South Coast were higher at 68 t (95% CI 59–77) in 2017/18 compared with 45 t (95% CI 38–51) in 2015/16, 33 t (95% CI 30–37) in 2013/14 and 54 t (95% CI 46–63) in 2011/12. Estimated recreational harvests in 2017/18 were higher for West Australian Dhufish (9–17 95% CI) compared with 2015/16 (3–8), 2013/14 (1–4) and 2011/12 (1–8). Estimated recreational harvests were steady for Bight Redfish, Pink Snapper, Blue Morwong, Breaksea Cod, Sea Sweep, Harlequin Fish, Swallowtail and Sergeant Baker in the South Coast.

The statewide top 10 pelagic scalefish species (or species groupings) in 2017/18 represented 85% of the total resource catch (kept by numbers). The estimated recreational harvest range for the top 10 pelagic species was steady at 104 t (95% CI 87–121 t) in 2017/18 compared with 106 t (95% CI 93–118 t) in 2015/16, but lower than 143 t (95% CI 124–163) in 2013/14 and 174 t (95% CI 154–193) in 2011/12. The estimated recreational harvest range of Spanish Mackerel was steady in 2017/18 (37–58) compared with 2015/16 (35–54), and lower than 2013/14 (69–103) and 2011/12 (78–108). The estimated recreational harvest range of Samsonfish was steady in 2017/18 (10–17) compared with 2015/16 (11–19), 2013/14 (16–28) and 2011/12 (14–22).

Estimated recreational harvest ranges of crab resources in each bioregion were also compared with previous statewide surveys. The estimated recreational harvest of Mud Crab in the North Coast represented 92% of the statewide total catch (kept by numbers) in 2017/18. The estimated recreational harvest range of Mud Crab in the North Coast was steady at 2.5 t (95% CI 2–3) in 2017/18 compared with 2.5 t (95% CI 2–3) in 2015/16, but lower than 6.5 t (95% CI 5–8) in 2013/14 and 7 t (95% CI 5–9) in 2011/12.

The estimated recreational harvest of Blue Swimmer Crab in the West Coast represented 90 % of the statewide total catch (kept by numbers) in 2017/18. The estimated recreational harvest range for Blue Swimmer Crab in the West Coast was steady at 54 t (95% CI 45–63) in 2017/18 compared with 43 t (95% CI 36–50) in 2015/16 and 59 t (95% CI 50–68) in 2013/14, but lower than 87 t (95% CI 76–98) in 2011/12. The estimated recreational harvest ranges for Blue Swimmer Crab were steady in 2017/18 in the: North Coast (1–3 95% CI compared with 1–3 in

2015/16, 2–6 in 2013/14 and 2–5 in 2011/12); Gascoyne Coast (1–10 compared with 1–2 in 2015/16, 1–4 in 2013/14 and 1–8 in 2011/12); and South Coast (0–0.14 compared with 0.2–1.2 in 2015/16, 1–3 in 2013/14 and 1–4 in 2011/12).

There have been significant changes in recreational fishing rules since the previous statewide surveys, including closure of the recreational fishery for southern garfish in Perth Metropolitan waters (31–33 degrees south) and the removal of closed season for Rock Lobster (where the season previously extended from 15 October each year until 30 June the following year). Additionally, management reviews have been conducted for the West Coast Demersal Scalefish Resource, Gascoyne Demersal Scalefish Resource (Pink Snapper) and south-west Blue Swimmer Crab Resource. Results from the statewide surveys will contribute to outcomes from these management reviews.

Data collected from the integrated statewide surveys are extensive, and while this report summarises key findings, further analyses and refinement of analysis methods will continue. Additional reports will compare estimates of effort and catch from the statewide surveys with previous surveys, as required for management purposes, and investigate the survey design and sample weighting in greater detail to identify any improvements that can be made.

While this report compares estimates from four statewide surveys of boat-based recreational fishing, additional catches from charter-boat recreational fishing (reported in Tour Operator Returns) and shore-based fishing (where available) are used to determine the total catch from the recreational sector. Specific performance indicators, reference levels and catch tolerances will be reported separately, and used to provide trends in total catch to assist in developing, monitoring and refining management arrangements.

# 1 Introduction

## 1.1 Importance of Recreational Fishing in Western Australia

Recreational fishing is a popular activity in Western Australia, providing important social and economic benefits to the State's population. The estimated number of recreational fishers increased from 315,000 in 1989/90 (Lindner and McLeod 1991) to 612,000 (95% CI 535,000–690,000) in 2017/18 (DPIRD 2018) and 619,000 (95% CI 542,000–696,000) in 2018/19 (DPIRD 2018). The participation rate of Western Australian residents is generally above the national average, with an estimated 26.6% of the population (aged 15 years or older) fishing in 1989/90 and 28.5% (aged 5 years or older) fishing in 2000/01 (Lindner and McLeod 1991, Henry and Lyle 2003). The participation rate in recreational fishing was estimated to be 25.4% (95% CI 22.2–28.7%) in 2017/18, and was not statistically different from the participation rate estimates of the last five years (DPIRD 2018). The expenditure attributable to recreational fishing in Western Australia has been estimated at \$55–130 million in 1989/90 (Lindner and McLeod 1991), \$338 million in 2000/01 (Henry and Lyle 2003) and \$2.4 billion in 2015/16 (Lindner and McLeod 2019).

Recreational fishers often have important catch-related motives such as fishing to 'obtain a feed' or 'for fresh seafood'. However, there are also significant social benefits from recreational fishing. Recreational fishers in Western Australia also have non-catch related motives (e.g. 'to relax and unwind', 'to be outdoors', 'for solitude', or 'to be with family and friends') as their primary motive for fishing (Henry and Lyle 2003). While most recreational fishers only catch a relatively small number of fish, collectively the recreational catch can be substantial. In 2000/01, the estimated total catch from boat- and shore-based recreational fishing in Western Australia included over 10.4 million finfish (by number) and 3.8 million invertebrates (by number; including crabs, prawns, lobster, and cephalopods) (Henry and Lyle 2003). The estimated total catch from boat-based recreational fishing was: 2.4 million finfish (by number) and 1.4 million invertebrates in 2011/12 (Ryan *et al.* 2013); 2.0 million finfish and 1.4 million invertebrates in 2013/14 (Ryan *et al.* 2015); and 1.3 million finfish and 1.5 million invertebrates in 2015/16 (Ryan *et al.* 2017). This reports provides an update of the estimated recreational catches from boat-based recreational fishing in 2017/18.

## 1.2 Need for Recreational Fishing Information

Information on recreational fishing effort and catch levels is used to inform stock assessments, resource allocation between fishing sectors, and the development, implementation and review of management plans. Effective management of fish resources requires accurate estimates of the catch taken by all sectors; therefore, a high priority has been placed on the collection of data for key recreational fisheries in Western Australia (Wise and Fletcher 2013, Ryan *et al.* 2016).

Obtaining suitable recreational fishing data in Western Australia is challenging because of the State's large coastline (20,781 km) and ongoing regional development, which is changing the distribution and intensity of recreational fishing activity. In 2017/18, the proportion of days fished (by recall) from the annual Community Survey was highest in the West Coast bioregion (50%),

around the capital city (Perth) and several of the State's large regional centres (Bunbury, Busselton and Geraldton; DPIRD 2018). Recreational fishing effort in marine waters was lower elsewhere, such as in the South Coast (17.9%), Gascoyne Coast (5.6%) and North Coast (17.9%; DPIRD 2018).

Estimating the total recreational catch can be logistically difficult and is often relatively costly. These difficulties are especially apparent where there is no licence available to use as a sampling frame to easily identify recreational fishers. Historically, recreational fishers in Western Australia only required a licence for rock lobster, abalone, marron, freshwater angling and netting. Although the Recreational Boat Fishing Licence (RBFL) was introduced in March 2010, there is still no licence required for shore-based recreational fishing. As a result, there are no contemporary estimates of the total boat- and shore-based catch. Importantly, in 2000/01, 57% of fishing effort and 54% of the recreational harvest was attributable to shore-based recreational fishing (Henry and Lyle 2003). It is likely that shore-based recreational fishing still represents a substantial component of the total recreational effort and harvest.

Recreational fishing licence fees raised \$8.5 million in 2017/18 (DPIRD 2018). This revenue is invested in initiatives with direct benefit to recreational fishers in Western Australia, including recreational fishing surveys. These surveys provide harvest estimates and socio-economic information to inform management and policy, including Marine Stewardship Council certification and Integrated Fisheries Management (IFM), to ensure fish resources are managed sustainably and shared between fishing sectors (Department of Fisheries 2010, Ryan *et al.* 2016). To date, explicit resource allocations have been developed for: Western Rock Lobster (5% recreational, 95% commercial); metropolitan Roe's Abalone (40t recreational, 36t commercial); and the West Coast Demersal Scalefish Fishery (36% recreational, 64% commercial). The implementation of the new Fisheries Act will require all new Aquatic Resource Management Strategies to have explicit sectoral allocations (Department of Fisheries 2010).

Long-term monitoring of recreational fishing will provide a greater understanding of temporal variability and trends in effort and catch that are essential for the assessment of stocks, resource allocation and management settings within the broad context of Ecologically Sustainable Development and Ecosystem Based Fisheries Management (Department of Fisheries 2019, Gaughan and Santoro 2019).

### **1.3 Recreational Fishing Surveys in Australia**

The spatial resolution of monitoring recreational fishing needs to be matched to the spatial scale at which fisheries are managed. For many jurisdictions, this requires off-site methods that are appropriate for sampling large geographical areas, with numerous access points to the fishery and many recreational fishers (Pollock *et al.* 1994). The sampling frame used to randomly select recreational fishers for an off-site survey can range from a general population list (e.g. White Pages® telephone directories) to specific lists (e.g. licence database). Sampling from the White Pages® requires contacting many non-fishing households to locate fishing households and does not include unlisted (silent or mobile) numbers (Taylor and Ryan 2019). Sampling from licence

databases has a higher probability of contacting fishers and includes fishers with or without a listed telephone; however, effectiveness is determined by exemptions, data availability and non-compliance (Ryan *et al.* 2009, Hartill *et al.* 2012).

The National Recreational and Indigenous Fishing Survey (NRFS) provided statewide estimates of boat- and shore-based recreational fishing across Australia from 1 May 2000 to 30 April 2001 (Henry and Lyle 2003). This survey used telephone interviews of fishers who were randomly selected from White Pages telephone directories. This methodology has been employed in subsequent statewide surveys in: South Australia from 1 November 2007 to 31 October 2008 (Jones 2009) and 1 December 2013 to 30 November 2014 (Giri and Hall 2015); Tasmania from 1 December 2007 to 30 November 2008 (Lyle *et al.* 2009), 1 November 2012 to 31 October 2013 (Lyle *et al.* 2014), and 1 November 2017 to 31 October 2018 (*in prep*); New South Wales from 1 June 2013 to 31 May 2014 (West *et al.* 2015), and 1 October 2017 to 30 September 2018 (*in prep*); Northern Territory from 1 April 2009 to 31 March 2010 (West *et al.* 2012), and 1 October 2017 to 30 September 2018 (*in prep*); and Queensland from 1 October 2010 to 30 September 2011 (Taylor *et al.* 2012) and 1 November 2013 to 31 October 2014 (Webley *et al.* 2015).

The statewide survey currently underway in Queensland has recruited diarists from a Screening Survey of randomly selected landline and mobile phone numbers from a commercial sample provider (SamplePages) (Misson *et al.* 2019). The Phone-Diary Survey from 29 April 2019 to 28 April 2020 will use multi-modal contact methods (<https://www.daf.qld.gov.au/business-priorities/fisheries/monitoring-compliance/monitoring-reporting/recreational-fishing/statewide-recreational-fishing-surveys>, accessed 7 October 2019).

Licence databases have been used as sampling frames for surveys designed to estimate the total recreational catch for many specialised, low participation, licensed fisheries (e.g. abalone, rock lobster and scallops) in Australia (e.g. Lyle and Tracey 2016, Ryan *et al.* 2009, Ryan *et al.* 2016). The advantages of sampling from a licence database include: reduced costs for the initial screening survey, high response rates (reducing non-response bias), and the ability to use an optimal survey design where avid fishers are oversampled, which can effectively increase the number of fishing events in the sample and improve precision (Ryan *et al.* 2009).

## **1.4 Recreational Fishing Surveys in Western Australia**

This report presents results from the statewide survey for the 12-months from September 2017 to August 2018 and provides comparisons with previous statewide surveys conducted from September 2015 to August 2016 (Ryan *et al.* 2017), May 2013 to April 2014 (Ryan *et al.* 2015) and March 2011 to February 2012 (Ryan *et al.* 2013). Prior to these four surveys, large scale surveys of boat-based recreational fishing in Western Australia included the statewide component of the National Recreational and Indigenous Fishing Survey (Henry and Lyle 2003), and Boat Ramp Surveys at a bioregion level. These included 12-month surveys in the West Coast in 1996/97 and 2005/06 (Sumner and Williamson 1999, Sumner *et al.* 2008, Wise and Fletcher 2013); Gascoyne Coast in 1998/99 (Sumner *et al.* 2002, Wise and Fletcher 2013) and 2007/08 (Marriott *et al.* 2012); North Coast in 1999/00 (Williamson *et al.* 2006); and South Coast in 2002/03

(Smallwood and Sumner 2007). The introduction of the Recreational Boat Fishing Licence (RBFL) provided a suitable sampling frame for a comprehensive statewide survey (both spatially and temporally) to estimate catch from boat-based recreational fishing in Western Australia. An integrated system that obtained data from several survey methods, utilising the RBFL as the basis for sampling recreational fishers, was developed to provide the most robust approach for obtaining annual estimates of catch from boat-based recreational fishing at both statewide and bioregion levels (Wise and Fletcher 2013).

## **1.5 Statewide Survey of Boat-Based Recreational Fishing**

The statewide survey includes three complementary components: (i) off-site Phone Surveys using the RBFL as a sampling frame, with an initial Screening Survey to recruit respondents for the longitudinal Phone-Diary Survey, followed by Post-Enumeration Surveys to detect differences among licence holders (Wash-Up/Attitudinal, Non-Intending Fisher and Benchmark Surveys); (ii) on-site Boat Ramp Surveys to provide biological information; and (iii) Remote Camera Surveys using digital cameras mounted at key access points to record 24/7 launches and retrievals. The main period of data collection was the 12-months from September 2017 to August 2018, with the Post-Enumeration Surveys occurring from September to December 2018.

## **1.6 Survey Objectives**

The overall objectives of this survey were to generate estimates of participation (by number of RBFL holders), effort (boat days and hours fished), and catch for all species (total, kept and released, by number) from boat-based recreational fishing for 12-months at statewide and bioregion levels. These estimates will complement data obtained routinely from the commercial sector. Additional objectives include: estimating recreational fishing effort and reasons for releasing any catch (e.g. size or bag limits, catch and release fishing, or personal preference). Furthermore, the implementation of regular, reliable and cost-effective surveys will provide data that will allow more realistic and rigorous assessments of recreational fisheries.

## **1.7 Report Structure**

This report provides statewide and bioregion estimates of effort and catch from boat-based recreational fishing in Western Australia, with complete coverage temporally, spatially and for all recreational fishing methods (including line, pot, net and diving), from September 2017 to August 2018. Where appropriate, comparisons are made with estimates from the previous statewide surveys conducted in 2015/16, 2013/14 and 2011/12.

Each chapter covers specific details or outputs, including:

**Chapter 2 (Survey Design and Analysis)** outlines the survey design and scope for the Phone, Boat Ramp and Remote Camera Surveys. Methods used for the expansion, weighting and analysis of survey data are discussed, along with measures of uncertainty associated with survey estimates.

**Chapter 3 (Participation)** presents estimates of the total number of RBFL holders that fished between September 2016 to August 2017 (Screening Survey) and September 2017 to August 2018

(Benchmark Survey). Participation estimates have been summarised by age, gender, bioregion fished and avidity.

**Chapter 4 (Fishing Effort)** presents estimates of effort from boat-based recreational fishing during the Phone-Diary Survey, including annual effort (boat days and hours fished), statewide and for each bioregion, by habitat, fishing method and month.

**Chapter 5 (Statewide Recreational Catch)** presents estimates of catch from boat-based recreational fishing during the Phone-Diary Survey, including annual catch (total, kept and released, by number), proportions released (release rates) and reasons for release for all species.

**Chapter 6 (Estimates of Catch for Key Species)** summarises estimates of catch from boat-based recreational fishing by bioregion, habitat, fishing method and season for key species, including indicator species within the Resource Assessment Framework.

**Chapter 7 (Bioregion Fisheries)** provides an overview of species composition and estimates of catch from boat-based recreational fishing in each bioregion, including annual catch (total, kept and released, by number) and proportions released for all species.

**Chapter 8 (Small-scale estimates)** provides an overview of species composition and estimates of catch from boat-based recreational fishing for zones within each bioregion, including annual catch (total, kept and released, by number) and proportions released for species where the sample size and relative standard error was considered acceptable (i.e. sample size  $\geq 30$  and relative standard error  $\leq 40\%$ ).

**Chapter 9 (Harvest Weights)** provides an overview of the estimated annual boat-based recreational catch (kept, by number), average weight and estimated harvest (by weight) for the most commonly caught demersal and nearshore species/species groupings in each bioregion.

## 2 Survey Design and Analysis

This section outlines the survey design and scope for the Phone, Boat Ramp and Remote Camera Surveys, methods used for weighting and analysis of survey data, and measures of uncertainty associated with survey estimates. Most aspects were consistent with the previous statewide surveys, with any differences discussed below.

### 2.1 Survey Scope

The integrated survey included three complementary components: (i) off-site Phone Surveys (encompassing an initial Screening Survey, a longitudinal Phone-Diary Survey, followed by post-enumeration Wash-Up/Attitudinal, Non-Intending Fisher and Benchmark Surveys); (ii) on-site Boat Ramp Surveys; and (iii) Remote Camera Surveys. Output specifications are listed in Table 1 to identify what was considered in-scope for each survey.

#### 2.1.1 Who Was Included In The Survey?

Persons in scope included recreational fishers that held a Recreational Boat Fishing Licence (RBFL), which is required to undertake any general fishing activity from a motorised vessel in Western Australia. Boat-based recreational fishers are required to have a minimum of one RBFL holder on board, and adhere to boat limits according to the number of RBFL holders, and in practice, the number of fishers generally equals the number of RBFL holders on board. In the Phone Surveys, fishers that held their licence in the 12-months prior to each survey component were in scope. An additional criterion for the Phone-Diary Survey was an intention to fish in the next 12-months (either from a boat or the shore). Commercial fishers were considered in scope if they held a RBFL, but any commercial catches by these fishers were not included. Indigenous fishing was not considered to be in the scope of this survey.

Persons in scope were comparable with previous statewide surveys across all survey components, with the exception of an additional sample for the Screening Survey as described here. Consistent with previous Screening Surveys, the sample was randomly selected from the RBFL database. This included any licence holders that concurrently held a Rock Lobster (RL) licence. However, approximately 40% of RL licence holders do not have a RBFL; consequently, previous statewide surveys have underestimated the recreational catch of Western Rock Lobster. For this reason, the Screening Survey in 2017/18 included an additional sample of 600 fishers who only held RL licences, with subsequent recruitment of intending fishers into the Phone-Diary Survey. This sample provided the appropriate data to estimate the recreational catch of Western Rock Lobster by fishers that only held the species-specific licence for Rock Lobster.

Only the results from the RBFL sample are presented in this report to maintain consistency and comparability with estimates from previous statewide surveys. Results from the RL only sample will be reported separately (in comparison with results from mail and phone-recall surveys).

A minimum age criterion of 5 years was applied to all surveys. In the Phone Surveys, parents were always a proxy for children aged 5–13 years and parent permission was required for children aged



14–17 years. No further proxies were allowed, except for nominated individuals within a household where there was language difficulty or illness. No substitution of respondents occurred during the Phone Surveys.

### **2.1.2 What Fishing Activities Were Covered?**

All boat-based recreational fishing methods were considered to be in scope, including line fishing, diving, netting, potting and spear fishing, as undertaken from a motorised vessel as per recreational fishing rules. Respondents in the Phone-Diary Survey reported the effort and catch for all fishers on the boat, which were standardised by the number of RBFL holders on each boat (i.e. catch per RBFL holder). Although fishers in the Phone-Diary survey reported catch information from Charter-boat recreational fishing, this information was excluded from analysis because Charter-boat catches are reported through mandatory Tour Operator Returns (Charter Logbooks). Charter-boat recreational fishing was not included in the Boat Ramp Surveys. Unreported illegal (non-compliant) recreational fishing activity was not included in the surveys. The proportion of RBFL holders that fished from the shore was assessed in the Screening and Benchmark Surveys.

Activities in scope were comparable with previous statewide surveys across all survey components, except for the Phone-Diary Survey. Shore-based recreational fishers, and their attributable catch, were not included in the Phone-Diary Surveys in 2013/14 and 2011/12. For this reason, the Phone-Diary Survey in 2017/18 included both boat- and shore-based recreational fishing, with shore-based recreational fishing events reported on an individual basis. It is not known if the sample of RBFL holders is representative of shore-based recreational fishers that do not hold a RBFL, therefore, shore-based recreational fishing data collected in the Phone-Diary Survey in 2017/18 requires subsequent adjustment (Taylor and Ryan 2019).

Only the results from boat-based recreational fishing are presented in this report to maintain consistency and comparability with estimates from the previous statewide surveys. Results from shore-based recreational fishing will be reported separately.

### **2.1.3 What Species Were Covered?**

Species in scope included any aquatic (animal) species caught from recreational fishing. This includes both finfish (e.g. scalefish, sharks and rays) and invertebrates (e.g. abalone, cephalopods, crabs, lobsters and prawns). Most catches are reported for individual species, but there are some instances where species have been reported in taxonomic groups (e.g. School Whiting includes Southern School Whiting, Western School Whiting and Yellowfin Whiting, King Snapper includes *Pristipomoides* spp., Whaler Sharks includes Bronze Whaler and Dusky Sharks). Aggregating species at higher-level reporting groups is particularly relevant for species where misidentification can occur, despite attempts to assist fishers in identifying fish. Where species or taxa groups are represented by few records, catches are reported in broad taxonomic categories (e.g. 'Other scalefish'). Species taxonomy follows the Codes for Australian Aquatic Biota (Rees *et al.* 2012, [www.marine.csiro.au/caab/](http://www.marine.csiro.au/caab/)). Consistent with the management of many of the multi-species fisheries in Western Australia, the results were in some instances also reported at the species suite level.

### 2.1.4 Survey Area

The geographic scope was fishing activity in Western Australia only. Consistent with the bioregion approach to fisheries management, the spatial strata for boat-based recreational fishing were the four marine bioregions off Western Australia (Figure 1). The Phone Surveys provided statewide coverage from all access points, while the Remote Camera Surveys provided statewide coverage as accessible from key access points (e.g. boat ramps or choke points) in the survey design, and the Biological Survey included key boat ramps in the West Coast and South Coast Bioregions. Based on Ecosystem Based Fisheries Management policy, bioregions are divided into broad ecological depth based habitats (Department of Fisheries 2011, Gaughan and Santoro 2019). These are pelagic (surface waters across all depths), offshore demersal (greater than 250m), inshore demersal (20–250m), nearshore (to 20m deep), estuarine (saltwater and ‘brackish’ to river mouth), and freshwater (river, stream, dams) (Figure 2).

### 2.1.5 Survey Duration

The 12-months from September 2017 to August 2018 applied to the Phone-Diary, Boat Ramp and Remote Camera Surveys. The Phone Surveys included an initial Screening Survey during the three months prior to the Phone-Diary Survey, and Post-Enumeration Surveys during the three months following the Phone-Diary Survey. This survey period was consistent with the previous statewide survey (September 2015 to August 2016), but different to the first two (May 2013 to April 2014 and March 2011 to February 2012). These adjustments were made to transition the commencement of the Phone-Diary Survey to a month with lower fishing activity.

The 12-months from September to August also provides continuous coverage of peak fishing seasons in the West Coast and South Coast (i.e. summer and autumn) and peak fishing seasons in the North Coast and Gascoyne Coast (i.e. autumn and winter) (Ryan *et al.* 2013, 2015, 2017). Starting the statewide surveys in September also includes: complete fishing seasons for Western Rock Lobster (south of North West Cape from mid-October to June (i.e. closed season from July to mid-October) and blue swimmer crab in Peel Harvey Estuary from November to August (i.e. closed season from September to October); and most of the fishing season for West Coast Demersal Scalefish (i.e. closed season mid-October to mid-December).

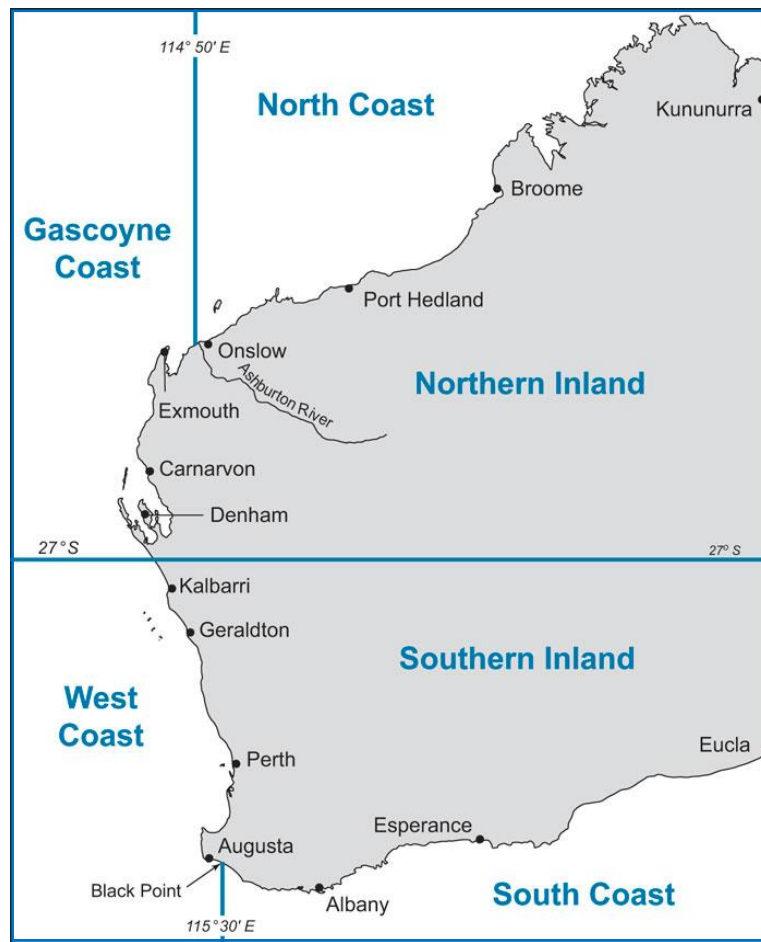
### 2.1.6 Survey Data Elements

Inherent differences between off-site (e.g. phone) and on-site (e.g. face-to-face) sampling were considered to ensure consistency (where possible) in the information collected from each survey component. A key difference between off-site and on-site sampling is whether fishing activity is recorded on an event or trip basis. For the Phone-Diary Survey, fishing information was collected on an ‘event’ basis, where separate events were recorded for changes in location, habitat, target species and/or fishing method. For example, line fishing and diving during a single trip would be recorded as separate events. Fishing activity in the Boat Ramp Surveys was recorded on a ‘trip’ or day basis. Where possible, data elements were standardised between surveys, in terms of question wording and responses. Reference tables for data elements (such as boat ramp, species and fishing method) were also standardised among survey components.

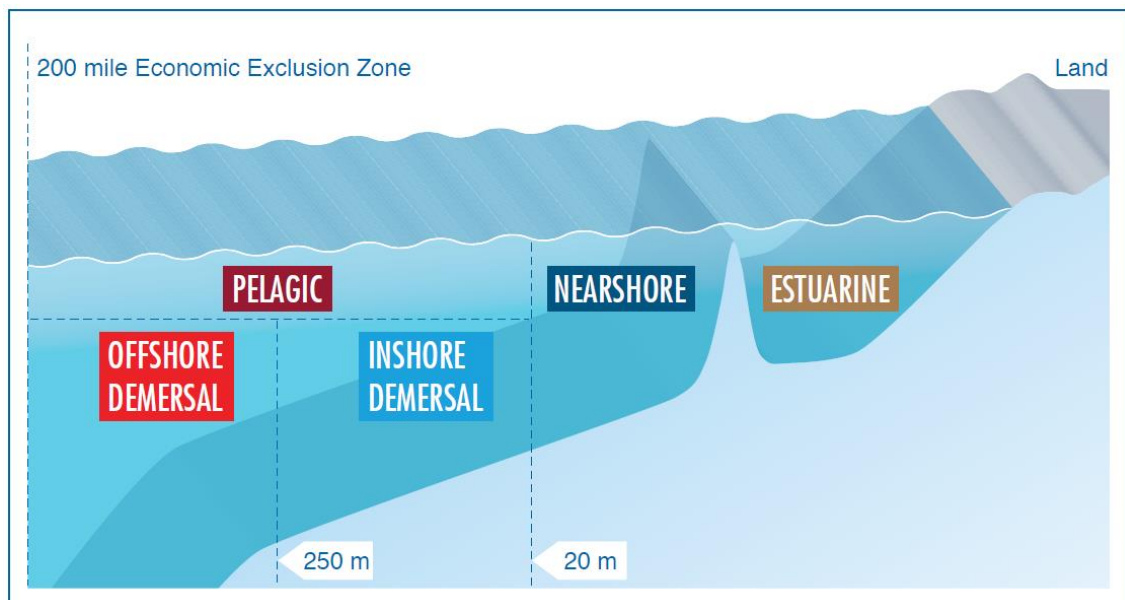
**Table 1.** Output Specifications for each survey component.

Specification	Item	Phone Surveys			Boat Ramp Surveys	Remote Camera Surveys
		Screening	Phone-Diary	Benchmark	Biological	
Persons in scope	Residency status	All, including Western Australian residents and interstate visitors			All	n/a
	Age	<5 years excluded			All	n/a
	Sampling frame	RBFL holders			Spatio-temporal frame	
		Sep 2016 to Aug 2017	Sep 2017 to Aug 2018			
Activities	Sectors	Recreational fishing only (traditional/indigenous fishing excluded)				
	Platform	Boat- and shore-based recreational fishing ( <i>by RBFL holders only</i> )			Boat-based recreational fishing only	
	Boat type	All, including private-boat, for-hire and charter-boat*			Private-boat and for-hire fishing (charter-boat excluded)	All, according to camera view at each ramp
	Methods	All methods including line fishing, diving, netting, potting and spearing				
Species	Species	All aquatic (animal) species				N/A
	Catch	Kept and Released			Kept	N/A
Geographic scope	Residency status	Western Australian residents, and interstate visitors			N/A	
	Fishing activity	Bioregion, marine vs freshwater	10x10 nautical mile grids statewide	Bioregion, marine vs freshwater	10x10 nautical mile grids statewide	N/A
	Fishing access	N/A	All, boat ramps (public and private), moorings and marinas	N/A	Key public boat ramps West Coast bioregion	Key public boat ramps statewide
Temporal scope	Annual coverage	12-months prior to Screening (by recall)	12-month longitudinal survey	12-months as per Phone-Diary (by recall)	Jan–Apr 2018	12-months as per Phone-Diary
	Day hours	All			Daylight hours	All
	Survey dates	Jun–Aug 2017	1 Sep 2017–31 Aug 2018	Sep–Nov 2018	Mid-Jan to Apr 2018	1 Sep 2017–31 Aug 2018

\* charter-boat recreational fishing (i.e. tour operators) was excluded from analysis in the report



**Figure 1.** Marine bioregions for mangement of fisheries resources in Western Australia.



**Figure 2.** Habitat groups for mangement of fisheries resources in Western Australia.

## 2.2 Survey Components

### 2.2.1 Phone Surveys

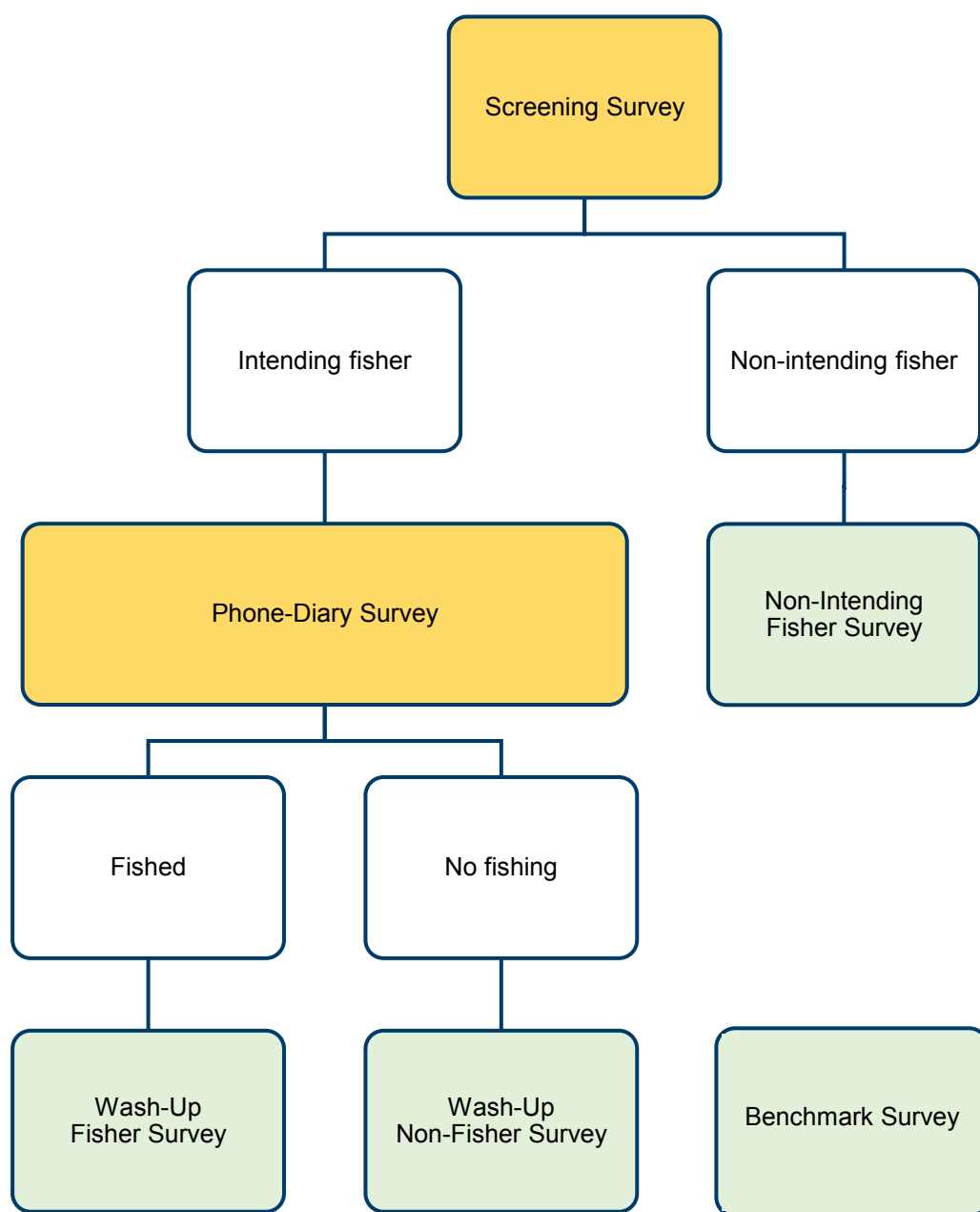
#### Survey Overview

The Phone Surveys were the main component of the integrated survey. This off-site survey was based on the telephone/diary methodology, which has been developed and proven to provide cost-effective data over large spatial scales (i.e. statewide and bioregion). Detailed descriptions of the design philosophy and methodology are provided in Lyle *et al.* (2002) and Henry and Lyle (2003). Key features of this methodology include: (i) tested survey instruments to minimise recall bias (e.g. Diary Card); and (ii) frequent telephone contact by trained interviewers to collect data at consistent standards, reduce potential bias, explain difficult concepts, counter resistance and ensure confidentiality. The combination of the Diary Card and structured interviews is designed to minimise respondent burden, increase response rates and ensure data quality.

Interviews were conducted by Computer-Assisted Telephone Interview (CATI), which provides a cost-effective and flexible means of recording questionnaire data that is entered directly into survey databases during interviews. It also provides an effective system for ensuring data quality as work stations are networked with a supervisor. Electronic survey data is contained within secure computer networks with appropriate management systems. Interviewers were allocated fishers from a variety of Regional Development Commission (RDC) boundaries to reduce the potential for interviewer bias between strata. Where possible and practical, the same interviewer maintained repeat contacts with the same respondent. When required, interviewer notes were made available for alternative interviewers on subsequent follow-up calls.

The primary objectives of the Phone Surveys were to estimate participation (by number of RBFL holders), effort (boat days and hours fished), and catch for all species (total, kept and released, by number) for recreational fishing for 12-months at statewide and bioregion levels.

The Phone Surveys used a multi-phase survey design (Figure 3) with: an initial Screening Survey to recruit fishers to the Phone-Diary Survey; a longitudinal Phone-Diary Survey to provide detailed effort and catch information over 12-months; and Post-Enumeration Surveys (i.e. Wash Up/Attitudinal, Non-Intending Fisher and Benchmark Surveys). These separate Post-Enumeration Surveys were conducted concurrently at the end of the 12-month Phone-Diary Survey to determine and adjust for exceptions outside the distribution of behaviours covered by the Phone-Diary Survey, particularly new licence holders and non-respondents, and to enquire about opinions of RBFL holders for various fishing-related matters.



**Figure 3.** Components for the statewide survey of boat-based recreational fishing in Western Australia 2017/18.

## **Screening Survey**

The Screening Survey (Figure 3) aims to collect profiling information (i.e. avidity, previous and intended fishing activity) from a random sample of RBFL holders and identifies RBFL holders that intended to fish in Western Australia during 2017/18 that were eligible for the Phone-Diary Survey. The Screening Survey was conducted by telephone interview during June to August 2017, therefore, the sampling frame was obtained from a database of fishers who purchased a RBFL between July 2016 and June 2017. The earlier timing of this sample was required to complete the survey before the Phone-Diary Survey (i.e. September 2017), but was considered to represent the population of interest (i.e. September 2016 to August 2017, Figure 4).

## **Phone-Diary Survey**

The Phone-Diary Survey (Figure 3) was conducted from 1 September 2017 to 31 August 2018 to estimate effort (boat days and hours fished), and catch for all species (total, kept and released, by number) for recreational fishing for 12-months at statewide and bioregion levels. Other information was also obtained in terms of public ramp usage, fishing method, fishing location, target species and reasons for release. The Phone-Diary Survey included all (boat- and shore-based) recreational fishing in Western Australia, using all fishing methods (such as line fishing, diving, nets, traps and spearfishing). Fishing activity was classified in terms of bioregion, habitat and fishing location as defined by unique location name, latitude and longitude co-ordinates, or 10 by 10 nautical mile grid blocks (Department of Fisheries 2011).

Respondents received a Diary Kit containing a Welcome Letter, Diary Card, Species Identification Guide (with clear colour images of common species) and Fishing Location Guide. The Diary Card was similar in format to that used previously in other surveys and is designed to be a 'memory jogger' rather than a traditional fishing logbook. Respondents were encouraged to use the Diary Card to record key fishing data that could easily be forgotten (e.g. start and finish times, number of fish kept and released) and were contacted regularly by survey interviewers, who were responsible for collecting this information. Respondents also received a brief Diary Explanation Interview with the survey interviewer after receiving the Diary Kit.

Species Identification Guides (Department of Fisheries 2017) were developed to help respondents identify common species, and enhance consistent and accurate species identification. Interviewers were trained in species identification (throughout the Phone-Diary Survey) and provided with relevant taxonomic references (Hutchins and Swainston 1999, Jones and Morgan 2002, Allen 2009, Rome and Newman 2010).

Fishing information was collected by monthly telephone interviews, even for fishers who indicated they were unlikely to fish in the subsequent month. More regular telephone interviews were made to the more avid fishers to minimise the potential for recall bias to influence fishing information. Some respondents did not actually fish during the Phone-Diary Survey, despite intending to during the Screening Survey. These fishers 'dropped-out' of the fishery, but this was in the range of expected behaviours for the survey.

### **Wash-Up/Attitudinal Surveys**

The Wash-Up/Attitudinal Survey was conducted during September to November 2018 to confirm completion of the survey, assess opinions and attitudes for a range of fisheries related issues, and collect boat-profiling information. Other questions were included to assess respondents' perceptions as to whether they fished '*more, less or about the same*' amount of time in the last 12-months, compared with the prior 12-months. Different Wash-Up/Attitudinal Surveys were administered (as appropriate) for respondents that fished, or did not fish, during the Phone-Diary Survey (Figure 3). This attitudinal information will be published separately.

### **Non-Intending Fisher Survey**

The Non-Intending Fisher Survey (Figure 3) was conducted during September to November 2018 to record the incidence of fishing by RBFL holders sampled in the Screening Survey that were not intending to fish in the next 12-months. These respondents were not eligible for the Phone-Diary Survey, but it was important to identify and account for 'unexpected fishing' that may have occurred during the 12-months. This 'call-back' survey determined the impact of unexpected 'drop-ins' to the fishery.

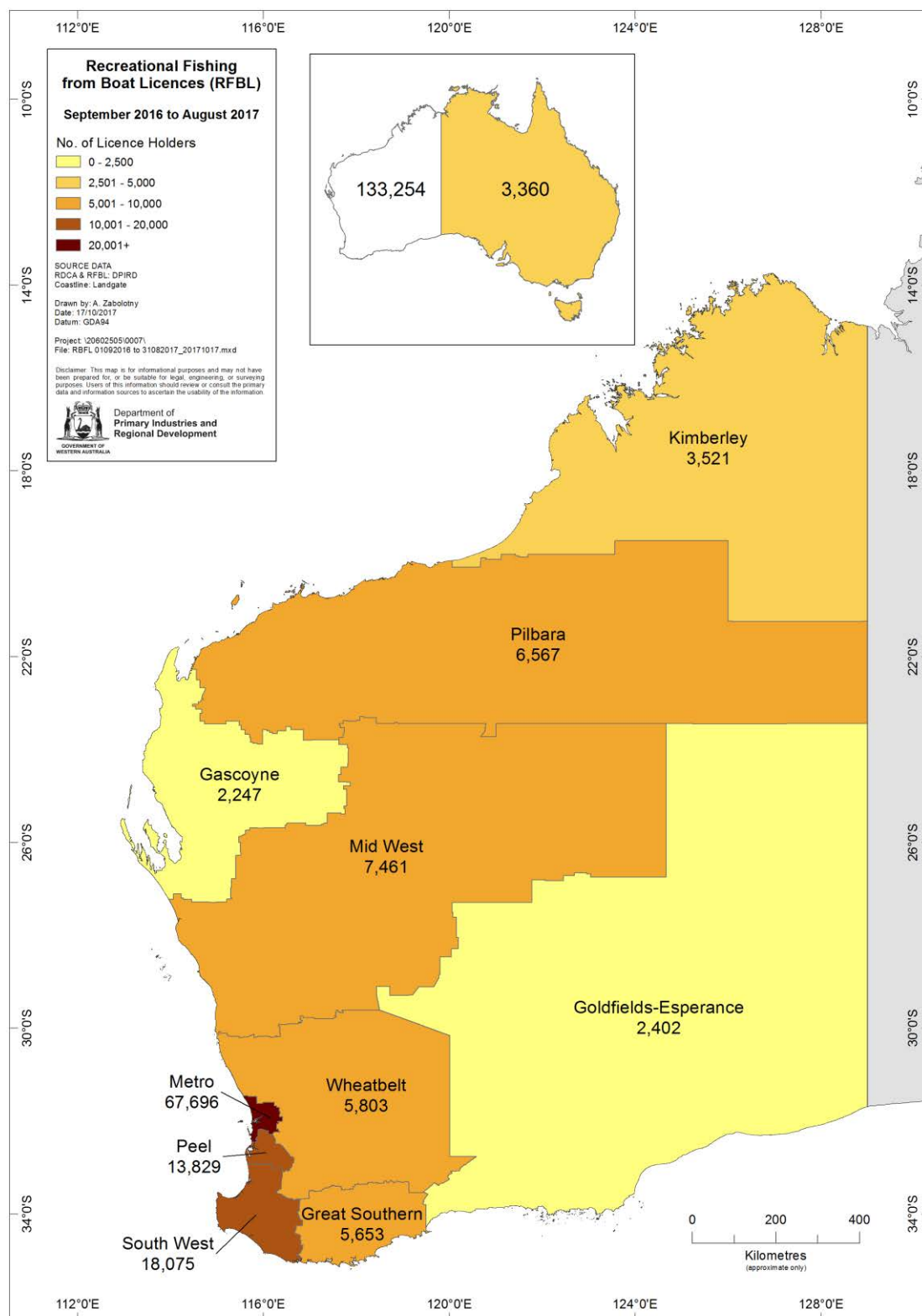
### **Benchmark Survey**

The Benchmark Survey (Figure 3) was conducted during September to November 2018 to identify the impact of additional 'drop-ins' to the fishery, such as RBFL holders who purchased a new licence in 2017/18 after the initial sample was drawn. This survey was essentially a repeat of the Screening Survey, with aims to collect profiling information (i.e. avidity, previous and intended fishing activity) for a random sample of people that were in possession of an RBFL for 12-months concurrent with the Phone-Diary Survey. Therefore, the sampling frame for the Benchmark Survey was obtained from a database of fishers who purchased a RBFL between September 2017 and August 2018 (Figure 5), excluding RBFL holders that had been selected for the Screening Survey. Most importantly, the Benchmark Survey provided the necessary information for licence holders from the current RBFL population for calibration and expansion of results from the Phone-Diary Survey.

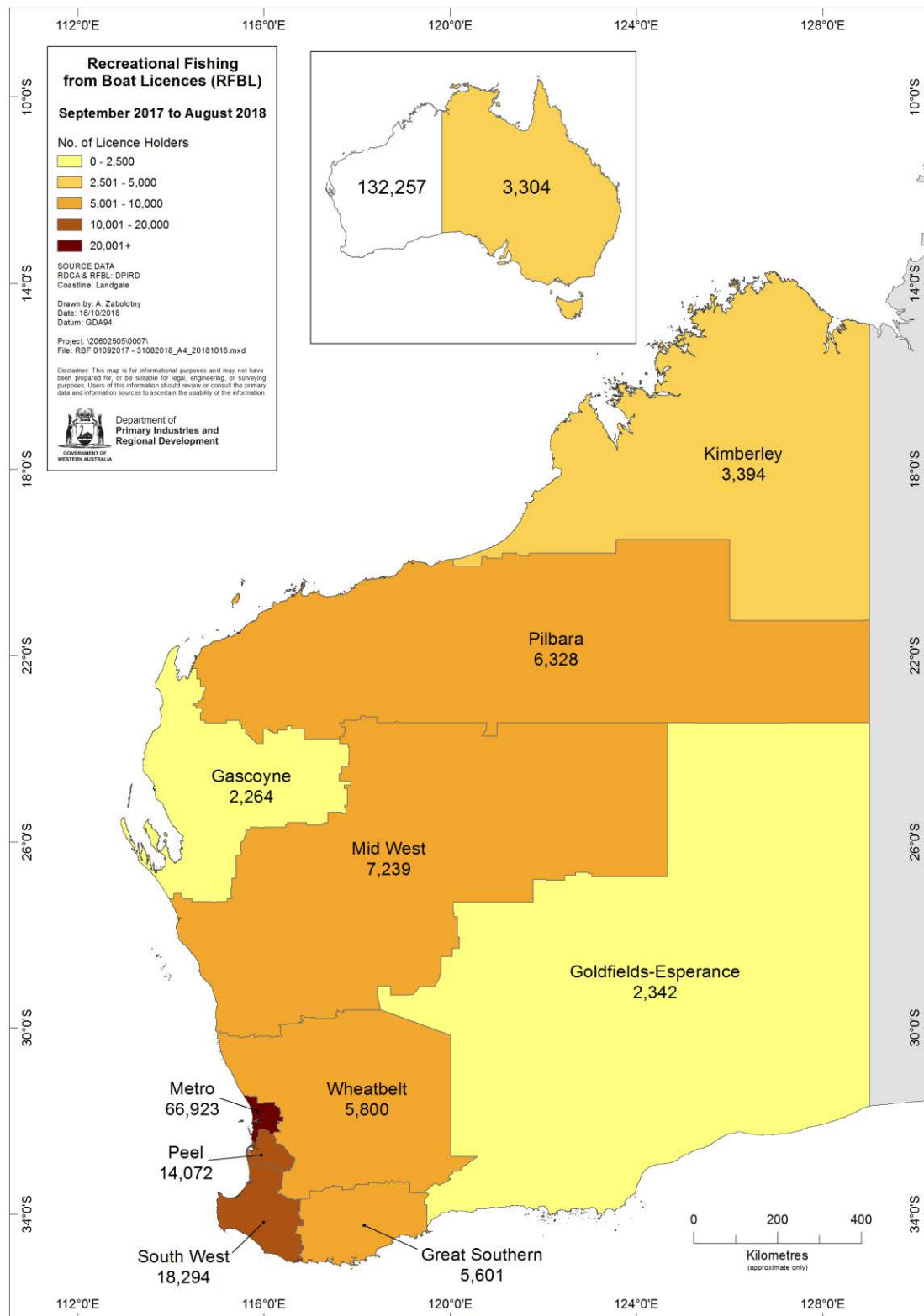
### **Survey Documentation**

The Phone Survey methodology utilises survey instruments, including questionnaires and interviewer manuals, to facilitate the collection/recording of survey data. These were initially produced following extensive design and testing (Survey Development Working Group 2000), and have been revised with subsequent statewide surveys (in each state and Territory). Highly structured questionnaires, with due consideration to question wording, instructions to interviewers and pre-coded answer categories were included in accordance with a range of standardised interviewing conventions. An equivalent approach was employed for all Phone Survey components in the present study, including thorough training and monitoring of interviewers, and development of a comprehensive interviewer manual.





**Figure 4.** Number of RBFL holders within Regional Development Commission Boundaries from September 2016 to August 2017.



**Figure 5.** Number of RBFL holders within Regional Development Commission Boundaries from September 2017 to August 2018.

## Response Profiles

A summary of response profiles relating to the Screening, Phone-Diary and Benchmark Surveys is given in Table 2. The majority (57%) of sample loss in the Screening Survey was from disconnected telephone numbers (3.4% of the gross sample) and from mobile phones being switched off (3.1% of gross sample). Sample loss also occurred where the respondent was not known at the number (1.3% of the gross sample), the respondent had moved and was known, but no new contact details were available (0.9%), the respondent was away for the survey (2.1%), fax/modem numbers (<0.1%), language difficulties (0.1%), duplicate number (0.1%), or respondent incapacitated or deceased (0.4%).

There were 3,441 RBFL holders identified as eligible for the Phone-Diary Survey (i.e. having an intention to fish in Western Australia during September 2017 to August 2018). This represented 81% of the fully responding group from the Screening Survey. Of the eligible RBFL holders, 3,234 (94%) agreed to participate in the Phone-Diary Survey. Subsequently, 2,931 respondents completed the Phone-Diary Survey, representing 98% completion rate among uptake, or 92% among eligible (Table 2). The 303 respondents that failed to complete the Phone-Diary Survey were mainly from sample loss (number no longer connected) and refusals.

The majority (75%) of sample loss in the Benchmark Survey was from disconnected telephone numbers (4.5% of the gross sample) and mobile never on (3.4% of gross sample). Sample loss also occurred where the respondent was not known at the number (0.8% of the gross sample), the respondent was known but no new contact details were available (0.8%), or the respondent was away for the survey (0.4%), language difficulties (<0.1%), duplicate number (0.2%), or respondent incapacitated or deceased (0.5%).

The initial Screening Survey conducted prior to the Phone-Diary Survey was based on a sample of 4,953 RBFL holders, of which 97.1% were fully responding (i.e. completed all required interview questions) (Table 2). The 127 non-responding RBFL holders were either non-contacts (1.5% of the net sample) or refusals (1.4% of the net sample). Similarly, the Benchmark Survey conducted after the Phone-Diary Survey was based on a sample of 5,195 RBFL holders, of which 96.9% were fully responding. The 143 non-responding RBFL holders were non-contacts (1.6% of the net sample) or refusals (1.5% of the net sample).

Non-response in the Screening and Benchmark Surveys were minimised by completing a minimum 20 effective calls to each respondent number, over a range of day times and days of the week, during the survey. Refusal rates were low for both surveys, and could be attributable to the use of experienced interviewers and the fact that relevance of the subject matter strongly correlates with response propensity (i.e. an ‘interest’ in fishing).

Response rates were relatively consistent across all sampling strata, and with previous statewide surveys (see Ryan *et al.* 2013, 2015, 2017). The response rates achieved in all components of this study were very high, which provides confidence in overall data quality and minimises the impact of non-response bias.

**Table 2.** Sample size and response profile for Screening, Phone-Diary and Benchmark Surveys by stratum.

SCREENING SURVEY	Total RBFL Holders	Initial sample	Sample loss	Net sample	Non-response	Full response	Response rate
Kimberley	3,521	250	29	221	5	216	97.74%
Pilbara	6,567	250	36	214	6	208	97.20%
Gascoyne	2,247	250	22	228	9	219	96.05%
Mid West	7,461	350	45	305	11	294	96.39%
Wheat Belt	5,803	250	23	227	3	224	98.68%
Metro	67,696	2,280	190	2,090	43	2,047	97.94%
Peel	13,829	400	44	356	9	347	97.47%
South West	18,075	670	77	593	8	585	98.65%
Great Sth'n	5,653	250	25	225	4	221	98.22%
Gold fields	2,402	250	17	233	4	229	98.28%
Interstate	3,360	250	21	229	2	227	99.13%
<b>TOTAL</b>	<b>136,614</b>	<b>5,450</b>	<b>529</b>	<b>4,921</b>	<b>104</b>	<b>4,817</b>	<b>97.89%</b>

PHONE-DIARY SURVEY	Full response at screening	Eligible for the Diary Survey	Diary Uptake	Diary Survey Completed	Uptake rate among eligible (%)	Completion rate among uptake (%)	Completion rate among eligible (%)
Kimberley	216	163	158	138	96.93%	87.34%	84.66%
Pilbara	208	170	161	141	94.71%	87.58%	82.94%
Gascoyne	219	154	144	132	93.51%	91.67%	85.71%
Mid West	294	210	205	197	97.62%	96.10%	93.81%
Wheatbelt	224	158	152	141	96.20%	92.76%	89.24%
Metro	2,047	1,396	1,343	1,259	96.20%	93.75%	90.19%
Peel	347	252	245	223	97.22%	91.02%	88.49%
South West	585	418	401	374	95.93%	93.27%	89.47%
Great Sth'n	221	171	164	153	95.91%	93.29%	89.47%
Goldfields	229	174	170	159	97.70%	93.53%	91.38%
Interstate	227	81	77	72	95.06%	93.51%	88.89%
<b>TOTAL</b>	<b>4,817</b>	<b>3,347</b>	<b>3,220</b>	<b>2,989</b>	<b>96.21%</b>	<b>92.83%</b>	<b>89.30%</b>

BENCHMARK SURVEY	Total RBFL Holders	Initial sample	Sample loss	Net sample	Non-response	Full response	Response rate
Kimberley	3,394	280	34	246	12	234	95.12%
Pilbara	6,328	280	25	255	11	244	95.69%
Gascoyne	2,264	280	37	243	7	236	97.12%
Mid West	7,239	290	24	266	10	256	96.24%
Wheatbelt	5,800	280	13	267	5	262	98.13%
Metro	66,923	2,150	183	1,967	50	1,917	97.46%
Peel	14,072	435	45	390	15	375	96.15%
South West	18,294	575	57	518	28	490	94.59%
Great Sth'n	5,601	280	23	257	8	249	96.89%
Goldfields	2,342	280	27	253	11	242	95.65%
Interstate	3,304	280	23	257	1	256	99.61%
<b>TOTAL</b>	<b>135,561</b>	<b>5,410</b>	<b>491</b>	<b>4,919</b>	<b>158</b>	<b>4,761</b>	<b>96.79%</b>

### 2.2.2 Boat Ramp Surveys

On-site Biological Surveys were completed at 19 boat ramps in the West Coast from January to April 2018 to obtain length and weight information enabling estimates of catch (by number) from the Phone-Diary Survey to be converted to catch (by weight). This enables direct comparison of recreational harvest estimates to commercial fishery information, which is routinely recorded as weights. Data were collected from 2,773 boat-based recreational fishing parties in the West Coast, with over 7,352 fish and other aquatic organisms measured. Due to the limited availability of resources, data were not collected in the South Coast, Gascoyne Coast and North Coast.

The target population included boat-based recreational fishers who retrieved from key boat ramps where research staff conducted face-to-face interviews with recreational fishers. The survey was based on a targeted design informed by data collected during the Biological and Remote Camera Surveys in 2011/12 (Ryan *et al.* 2013), 2013/14 (Ryan *et al.* 2015) and 2015/16 (Ryan *et al.* 2017). By targeting key boat ramps at peak times of fishing activity (i.e. season, day type and time of day) the surveys aimed to maximise the collection of biological information. The primary sampling unit was sample day and the secondary sampling unit was fishing party, which could include both RBFL holders and non-licensed fishers.

Spatial stratification for the Biological Survey in the West Coast bioregion included regions and zones, within which 18 boat ramps were sampled, including 4 ramps in the North Zone, 9 in the Metro zone and 5 ramps in the South zone.

Temporal stratification was determined by day type and time of day, which have a major influence on boating activity in the West Coast bioregion. Surveys were therefore scheduled during the middle of the day and predominately on weekends or public holidays, to coincide with the busiest periods of boating activity. The aim was to collect a similar number of fish measurements in the West Coast bioregion as the previous Biological Surveys in 2011/12, 2013/14 and 2015/16 and, as a result, 1–2 surveys per week were randomly scheduled at each ramp, with equal allocation across month. Sample days were approximately 4-hours duration and confined to daylight hours only.

Prior to the commencement of the survey, interviewers were provided with training in interview techniques, survey instruments and species identification as well as documentation relating to interviewer guidelines, forms and questionnaires.

The average weights of key species obtained from the Biological Surveys are utilised in Chapter 9 (Harvest Weights) to convert estimates of catch (by numbers) to weight. Depending on the species, its distribution and the number of measurements obtained, a statewide or bioregional value may be applied. Alternatively, if insufficient data are available from the Biological Survey then data from unpublished Tour Operator Returns may be used as an alternative data source.

Summaries of average weight for all species collected from the West Coast Bioregion during the Boat Ramp Surveys are also given in Appendix 1. This includes the number of weight measurements recorded, average weight (measured in grams where >10 measurements were obtained statewide) and

standard error. Additional results from the previous Biological Surveys in 2011/12, 2013/14 and 2015/16 are provided in a separate report (Smallwood *et al.* 2017).

### **2.2.3 Remote Camera Surveys**

The Remote Camera Surveys monitor recreational boating activity via digital cameras at key boat ramps and choke points to assist with the corroboration and validation of estimated effort (from the Phone-Diary Survey) and determining levels of boating activity between statewide surveys. The position of cameras at each access point was determined by the available infrastructure and logistics of transmitting information (Blight and Smallwood 2015). Cameras were positioned at boat ramps (which excludes boat movements from moorings) or choke points (which includes boat movements from moorings). A framework for the integration of Remote Camera Surveys with recreational fishing surveys is provided in a separate report (Steffe *et al.* 2017).

Camera data are aggregated to provide the number of powerboat retrievals over 24-hours for 12-months concurrent with the Phone Diary Surveys. Although remote cameras are expected to operate continuously, outages occurred as a result of technological failure and extreme weather (e.g. power loss and cyclones). A new method of accommodating short- and medium-term data loss due to outages has been generated that uses climatic and temporal variables to “fill in” missing gaps in the camera footage (Afrifa-Yamoah *et al.* in prep). This method has been applied to remote camera data for six high use ramps in the Perth Metropolitan region (Ocean Reef, Mindarie, Hillarys, Leeuwin and Woodman Point) for which the estimated number of powerboat launches and retrievals was generated to coincide with previous 2011/12, 2013/14, 2015/16 Phone-Diary Surveys.

These estimates will be reported in a separate publication. Ongoing research is investigating the trade-off between the cost of reading the camera data and the precision of the estimates of boating activity obtained for the various sampling designs and sample sizes. This will assist in the ongoing monitoring of boating activity at key access points, including the cost-effective reading of the remote camera data to coincide with the 2017/18 Phone-Diary Survey.

To coincide with the 2017/18 Phone-Diary Survey, estimates of boating activity have been generated for the three public boat ramps that provide access to Shark Bay: (i.e. Denham, Monkey Mia and Nanga.), where there was minimal missing data. These estimates are reported in a separate publication entitled “Integrated survey of boat-based recreational fishing in inner Shark Bay 2018/19” (Taylor *et al.* 2019) because they form the basis of ramp-based estimates of the recreational catch in inner Shark Bay.

## **2.3 Phone-Diary Survey Expansion, Weighting and Analysis**

The Phone Surveys design incorporate stratified random sampling with samples divided into homogenous units to reduce sampling variance (Cochran 1977, Pollock *et al.* 1994, Lohr 2010, Särndal *et al.* 2003). These strata related to Regional Development Commission Boundaries and the Perth Metropolitan region in Western Australia. The number of samples within each stratum were selected proportionally to the size of the stratum. A single residential stratum applied to

interstate RBFL holders (<2% of all RBFL holders). Overseas RBFL holders (<0.02% of all RBFL holders) were excluded from the Phone Surveys. Exclusions from the sampling frame occurred before sample selection where currency of address information was invalid or fishers were identified as having multiple licences. All sampling was done without replacement.

Data from Phone Surveys that use the White Pages as a sampling frame can be expanded to the total population using profiles from the Australian Bureau of Statistics, based on household structure, age and gender (Giri and Hall 2015, Lyle *et al.* 2014, Webley *et al.* 2015, West *et al.* 2012, West *et al.* 2015). However, a different approach is required for surveys that use licence sampling frames, particularly if the database is constantly changing. Analysis of the RBFL database indicates that approximately 25% of RBFL holders do not renew their licence (i.e. ‘drop-out’), while approximately 25% of RBFL holders take up a new licence (i.e. ‘drop-in’) each year. Samples were taken prior to each Screening Survey for all licence holders eligible to fish in the previous 12 months and the Phone-Diary Survey did not progressively sample and recruit new entrants to the RBFL population during the survey.

The Benchmark and Non-Intending Fisher Surveys were designed to assist in matching respondents from the Phone-Diary Survey (sampled from the RBFL population in 2016/17) to the RBFL population in 2017/18 (i.e. people that had a licence) during the Phone-Diary Survey. Calculation of weighting factors requires counter-parting respondents in the Phone-Diary Survey (based on actual days fished) with respondents in the Benchmark Survey (based on recalled days fished). This process accounts for behavioural differences that result from the dynamic nature of the RBFL population. Counter-parting was based on recall and actual effort collected during the Phone-Diary Survey to account for a likely overestimate of recalled effort in the Benchmark Survey. The sample weight (or expansion factor) for a given subsample was determined by the inverse of the fraction it represented in the population, according to the following equation, where  $\alpha_{hi}$  = weight for RBFL holder  $i$  in stratum  $h$ ,  $N_h$  = total number of RBFL holders in stratum  $h$ ,  $n_h$  = number of RBFL holders sampled in stratum  $h$ .

$$\alpha_{hi} = \frac{N_h}{n_h}$$

The total catch of species in each stratum over the Phone-Diary Survey was calculated by multiplying the weighted catch for all respondents in each stratum by the number of RBFL holders in each stratum for the relevant RBFL population, as determined by the Benchmark Survey. This approach accounts for: fishers that unexpectedly ‘drop-out’ from the Phone-Diary Survey (i.e. respondents that intended to fish, but did not); fishers that unexpectedly ‘drop-in’ during the Phone-Diary Survey (i.e. respondents in the Screening Survey that did not intend to fish during the Phone-Diary Survey, but actually did); and additional ‘drop-in’ fishers (i.e. fishers who were not eligible for sample selection for the Screening Survey, but purchased a RBFL during the Phone-Diary Survey).

Raw data collected from respondents have been initially expanded by the number of RBFL holders in the residential stratum divided by the number of RBFL holders sampled in residential stratum.

Future estimates may be based on adjustment of weighting factors to account for avidity bias and non-intending fishing and will be reported separately (as required). Parameter estimates in this report are based on expanded data, scaled-up to represent the appropriate stratum population. Estimates were determined for participation (by number of RBFL holders), effort (boat days and hours fished) and catch for all species (total, kept and released, by number). Estimates of average weight were obtained from Boat Ramp Surveys or Tour Operator Returns. Expansion of Phone Survey data to population estimates was undertaken using the *survey* package (Lumley 2004, 2010) in the statistical computing language *R* (R Core Team 2016). Detailed descriptions of the *survey* and *recsurvey* packages are given in Lumley (2010) and Lyle *et al.* (2010) respectively.

## 2.4 Uncertainty

The integrated surveys provide catch estimates in a cost-effective manner; however, they are still surveys, and as such, cannot be expected to provide the level of precision that would be available from a total census. As such, three measures of uncertainty are used:

- i. Standard error indicates the difference between the estimate (obtained from a sample) and the true value (of the population). The standard error of the estimate is calculated from the standard deviation of the sample divided by the sample size.
- ii. Relative standard error indicates the uncertainty expressed as a percentage of the estimate (or as decimal values from 0.00 to 1.00), allowing comparisons between estimates that accounts for differences in the magnitude of estimates. The relative standard error of the estimate is calculated from the standard error of the sample divided by the estimate.
- iii. Confidence intervals represent the range in which the population value is likely to occur as determined by the estimate and associated standard error. The 95% confidence intervals are equal to the estimate plus or minus 1.96 multiplied by the standard error. This indicates the chance of the population value occurring within approximately two standard errors of the estimate. Confidence intervals are most frequently used to determine statistical significance where the difference between two estimates is considered statistically significant if the probability that they are different is at least 95%.

Interpretation of estimates requires consideration of both the number of fishers that contributed to the estimate and the magnitude of the relative standard error. Where required, estimates in tables have been highlighted to identify sample size <30 fishers and relative standard error >40% (or 0.40) (Lyle *et al.* 2014, Ryan *et al.* 2017, Webley *et al.* 2015, West *et al.* 2015). For estimates of catch, the sample size refers to the number of fishers reporting a catch of that species (either kept or released). These cautions indicate that estimates may not be robust.

## 2.5 Reporting Notes

Estimates include uncertainty, with associated standard errors provided in all tables and figures, although these are not routinely cited in text. The tables also provide an indication of whether estimates are considered robust (i.e. sample size  $\geq 30$  and relative standard error  $\leq 0.40$ ). Estimates



from the current statewide survey are compared with previous statewide surveys in 2015/16, 2013/14 and 2011/12, as appropriate.

Recreational fishers that did not hold a RBFL (including many shore-based only recreational fishers) and RBFL holders that intended to fish only in freshwater were out of scope for the Phone-Diary Survey. Therefore, estimates of catch for inland, estuarine and nearshore species provided in this report, particularly those harvested with high proportions of shore-based effort, will be underestimated. Additionally, catch estimates for Western Rock Lobster, which can be harvested by fishers with only a Rock Lobster licence, will also be underestimated.

This report presents estimates for boat-based recreational fishing to maintain consistency and comparability with estimates from previous statewide surveys. Estimates for shore-based recreational fishing and Rock Lobster will be reported separately.

Confidence intervals are used to summarise temporal changes between annual estimates. If the 95% confidence intervals overlap, then there is assumed to be no statistical difference, and this is described in this report as “*steady*”. If the 95% confidence intervals do not overlap, then there is a statistical difference (i.e. the probability that they are different is at least 95%), which is described in this report as “*increasing*” (if the latest estimate is higher than previous) or “*decreasing*” (if the latest estimate is lower than previous).

While this report compares estimates from four statewide surveys of boat-based recreational fishing with RBFL, additional catches from charter-boat recreational fishing (reported in Tour Operator Returns), RI-only licences and shore-based fishing (where available) are used to determine the total catch from the recreational sector. Specific performance indicators, reference levels and catch tolerances will be reported separately, and used to provide trends in total catch to assist in developing, monitoring and refining management arrangements.

### 3 Participation

This section presents results from the Screening and Benchmark Surveys. These cross sectional, recall surveys were based on respondents that held a Recreational Boat Fishing Licence (RBFL) between September 2016 to August 2017 (Screening) and September 2017 to August 2018 (Benchmark). These results are highly comparable to those from previous statewide surveys.

#### 3.1 Fishing Participation

From the population of 136,614 RBFL holders that held a licence in the 12 months prior to September 2017 (2016/17; Figure 4) an estimated 106,823 (78%) RBFL holders fished at least once, and an estimated 29,791 (22%) did not fish in Western Australia (Figure 6a). Similarly, from the population of 135,561 RBFL holders in the 12 months prior to September 2018 (2017/18; Figure 5) an estimated 102,113 (75%) RBFL holders fished at least once, and an estimated 33,448 (25%) did not fish.

Higher participation occurred for boat-based recreational fishing compared with both (boat- and shore-based) (Figure 6b) and in marine water compared with freshwater and both (salt- and freshwater) (Figure 6c); however, participation in shore-based and freshwater-only recreational fishing may be lower for RBFL holders than for shore-based fishers (i.e. non-RBFL holders).

Males accounted for the majority of RBFL holders (87% of all RBFL holders in 2016/17 and 86% in 2017/18). Females accounted for 13% in 2016/17 and 14% of RBFL holders in 2017/18 (Figure 6d).

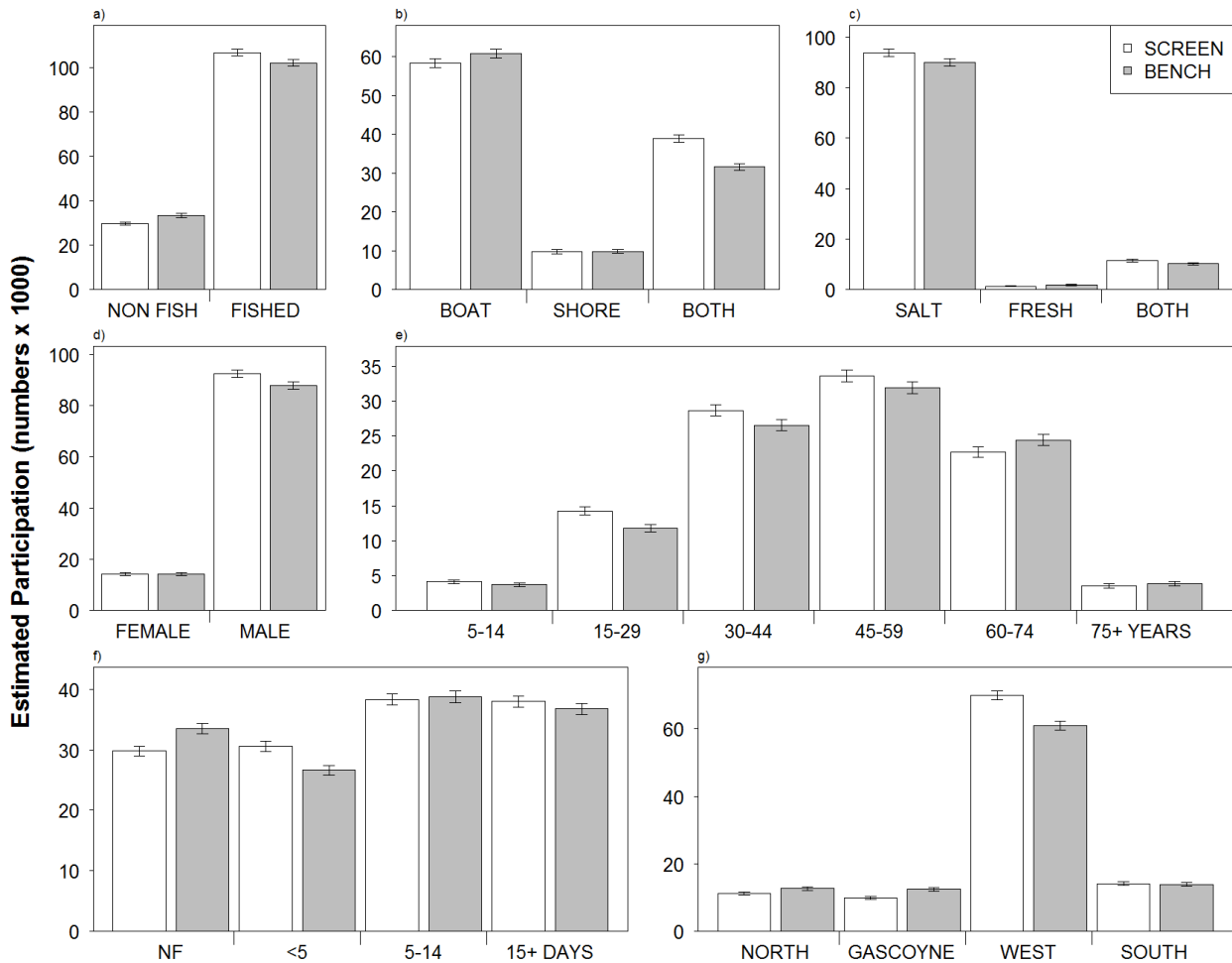
The highest numbers of RBFL holders that fished were in the 45 to 59-year age group (31% of all RBFL holders that fished in 2016/17 and 2017/18), followed by the 30 to 44-year age group (27% in 2016/17 and 26% in 2017/18; Figure 6e), the 15 to 29-year age group (13% in 2016/17 and 12% in 2017/18), and the 60 to 74-year age group (21% in 2016/17 and 24% in 2017/18). The lowest numbers of RBFL holders that fished were in the 5 to 14-year age group (4% in 2016/17 and 2017/18) and the 75 year or older group (3% in 2016/17 and 4% in 2017/18).

The number of days fished (by recall) in the 12-months prior to each survey is a measure of the fishing avidity. RBFL holders were equally likely to recall fishing 5 to 14 days (36% in 2016/17 and 38% in 2017/18) or 15 days or more (36% in 2016/17 and 34% in 2017/18; Figure 6f). Lower proportions of RBFL holders (29% in 2016/17 and 26% in 2017/18) recalled fishing less than 5 days during each 12-months.

RBFL holders were most likely to recall fishing in the West Coast (66% in 2016/17 and 61% in 2017/18; Figure 6g). Lower proportions of RBFL holders recalled fishing in the South Coast (13% in 2016/17 and 14% in 2017/18); North Coast (11% in 2016/17 and 13% 2017/18); and Gascoyne Coast (9% in 2016/17 and 12% in 2017/18).

Similar statewide trends were observed in estimated participation for the 12-months prior to previous Screening and Benchmark Surveys (see Ryan *et al.* 2013, 2015, 2017). However, differences in estimated participation occurred according to residence (Perth Metropolitan,

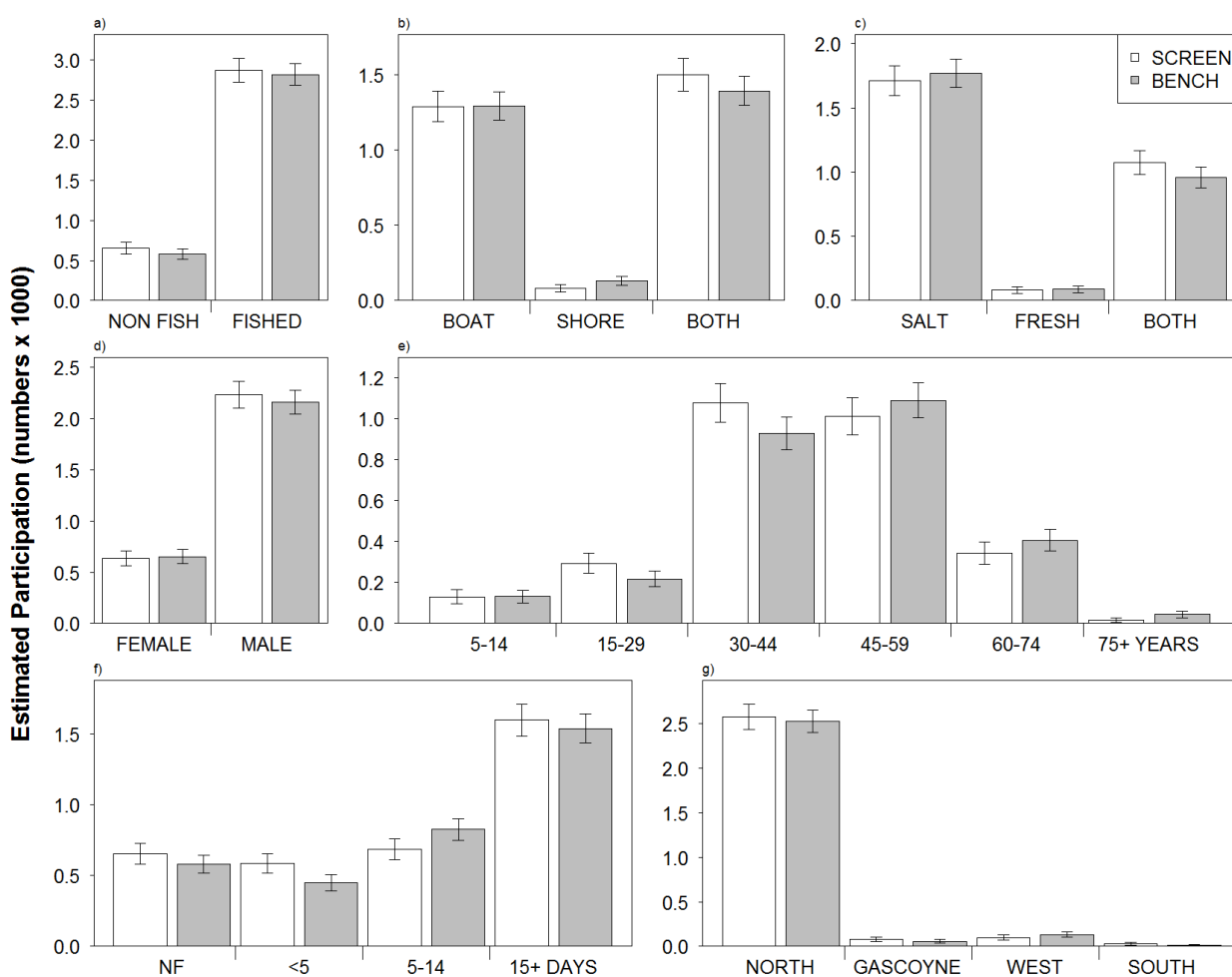
Regional Development Commissions (RDC), and Interstate), which are discussed in the remainder of this chapter. Notably, RBFL holders were most likely to fish in the bioregion closest to their home residence (e.g. residents from the Kimberley and Pilbara were most likely to fish in the North Coast). However, many RBFL holders travel throughout the state (e.g. residents from the Mid West, Metro and Peel fished in the South Coast, and residents from the Kimberley, Pilbara and Gascoyne fished in the West Coast).



**Figure 6.** Estimated number of RBFL holders aged five years and older who fished recreationally in the 12-months prior to September 2017 (white bars, SCREEN, Screening Survey) and September 2018 (grey bars, BENCH, Benchmark Survey); a) non-fishers and fishers; b) boat-based and both (including shore-based); c) marine and freshwater; d) gender; e) age (years); f) avidity (days fished per year); and g) bioregion fished.

## 3.2 Kimberley

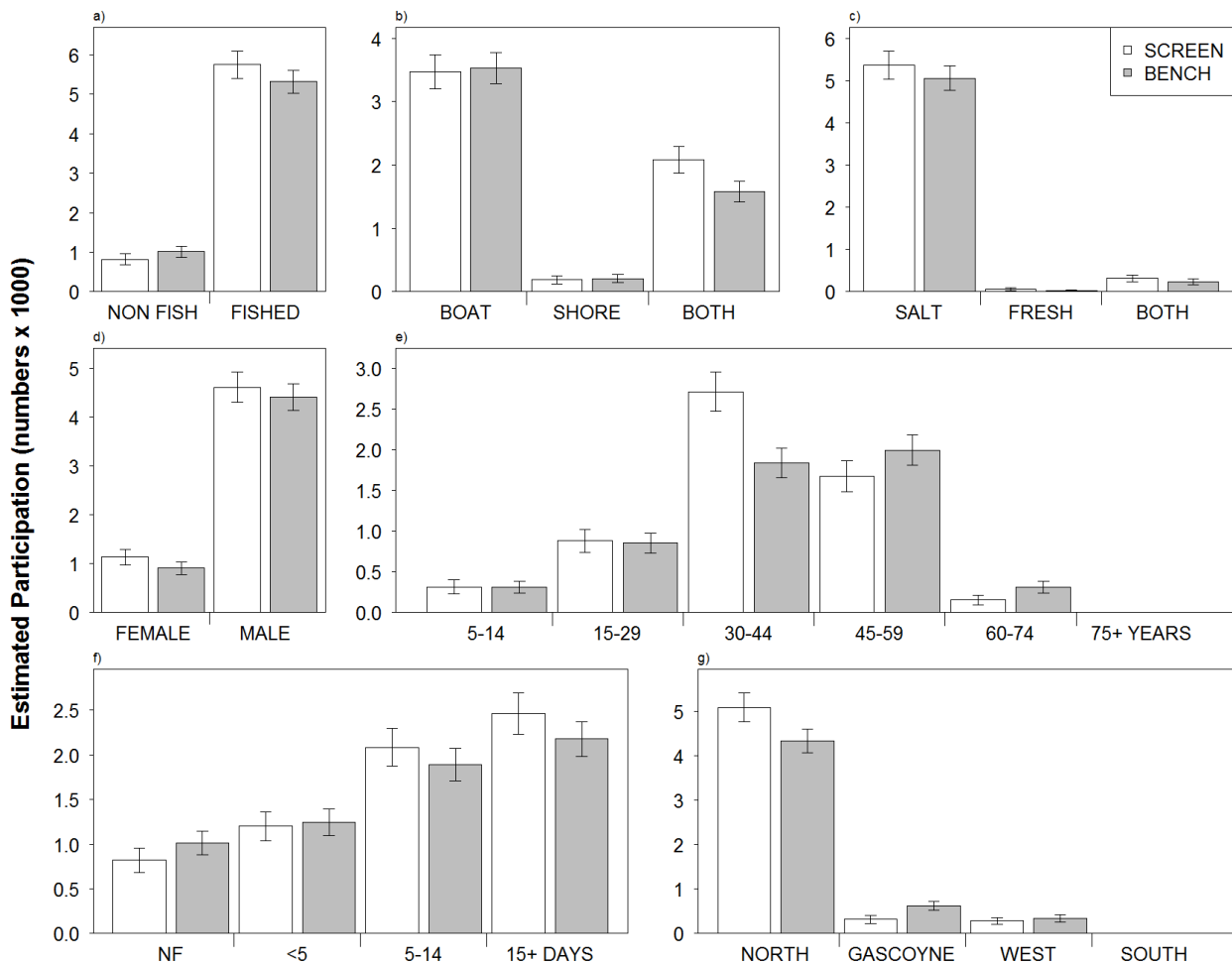
A total of 3,521 residents in the Kimberley RDC held an RBFL in the 12 months prior to September 2017 (Figure 4), with an estimated 2,869 (81%) fishing at least once in 2016/17; Figure 7a). Similarly, 3,394 residents held a RBFL in the 12 months prior to September 2018 (Figure 5), with an estimated 2,814 (83%) fishing at least once in 2017/18. Most RBFL holders were male (78% in 2016/17 and 77% in 2017/18), and higher proportions of females participated in fishing (22% in 2016/17 and 23% in 2017/18; Figure 7d) compared with statewide estimates. The majority of RBFL holders that fished were in the 30 to 44-year age group (37% in 2016/17 and 33% in 2017/18) or the 45 to 59-year age group (35% in 2016/17 and 39% in 2017/18; Figure 7e). Most RBFL holders recalled fishing 15 days or more (56% in 2016/17 and 55% in 2017/18; Figure 7f) and fished in the North Coast (92% in 2016/17 and 93% in 2017/18; Figure 7g).



**Figure 7.** Estimated number of Kimberley RDC residents (RBFL holders aged five years and older) who fished recreationally in the 12-months prior to September 2017 (white bars) and September 2018 (grey bars); a) non-fishers and fishers; b) boat-based and both (including shore-based); c) marine and freshwater; d) gender; e) age (years); f) avidity (days fished per year); and g) bioregion fished.

### 3.3 Pilbara

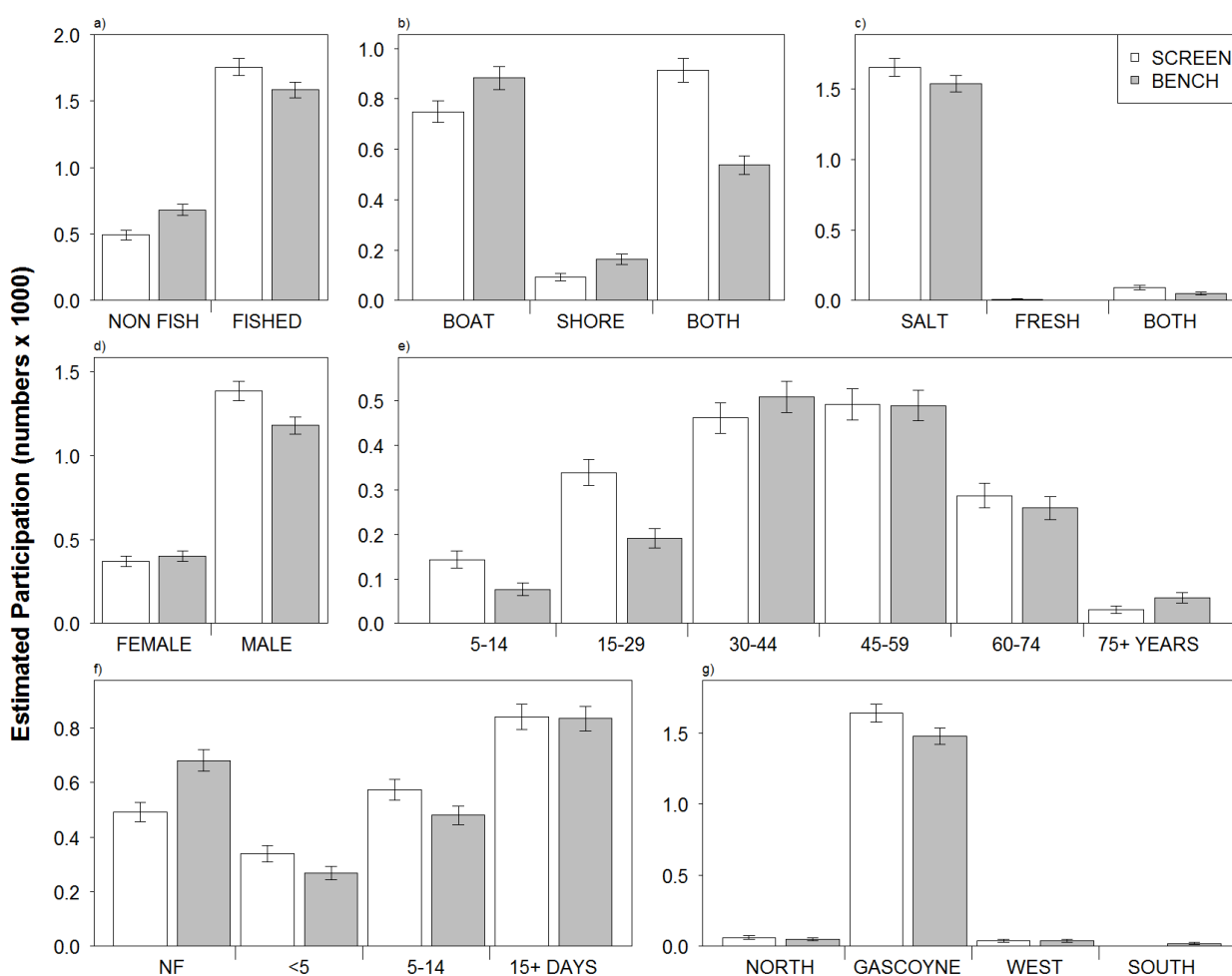
A total of 6,567 residents in the Pilbara RDC held an RBFL in the 12 months prior to September 2017 (Figure 4), with an estimated 5,746 (87%) fishing at least once in 2016/17 (Figure 8a). Similarly, 6,328 residents held an RBFL in the 12 months prior to September 2018 (Figure 5), with an estimated 5,317 (84%) fishing at least once in 2017/18. Males accounted for the majority of RBFL holders (80% in 2016/17 and 83% in 2017/18), and higher proportions of females participated in fishing (20% in 2016/17 and 17% in 2017/18; Figure 8d) compared with statewide estimates. Most RBFL holders that fished were in the 30 to 44-year age group (47% in 2016/17 and 35% in 2017/18) or the 45 to 59-year age group (29% in 2016/17 and 38% in 2017/18; Figure 8e), recalled fishing 15 days or more (43% in 2016/17 and 41% in 2017/18; Figure 8f), and fished in the North Coast (89% in 2016/17 and 82% in 2017/18; Figure 8g).



**Figure 8.** Estimated number of Pilbara RDC residents (RBFL holders aged five years and older) who fished recreationally in the 12-months prior to September 2017 (white bars) and September 2018 (grey bars); a) non-fishers and fishers; b) boat-based and both (including shore-based); c) marine and freshwater; d) gender; e) age (years); f) avidity (days fished per year); and g) bioregion fished.

### 3.4 Gascoyne

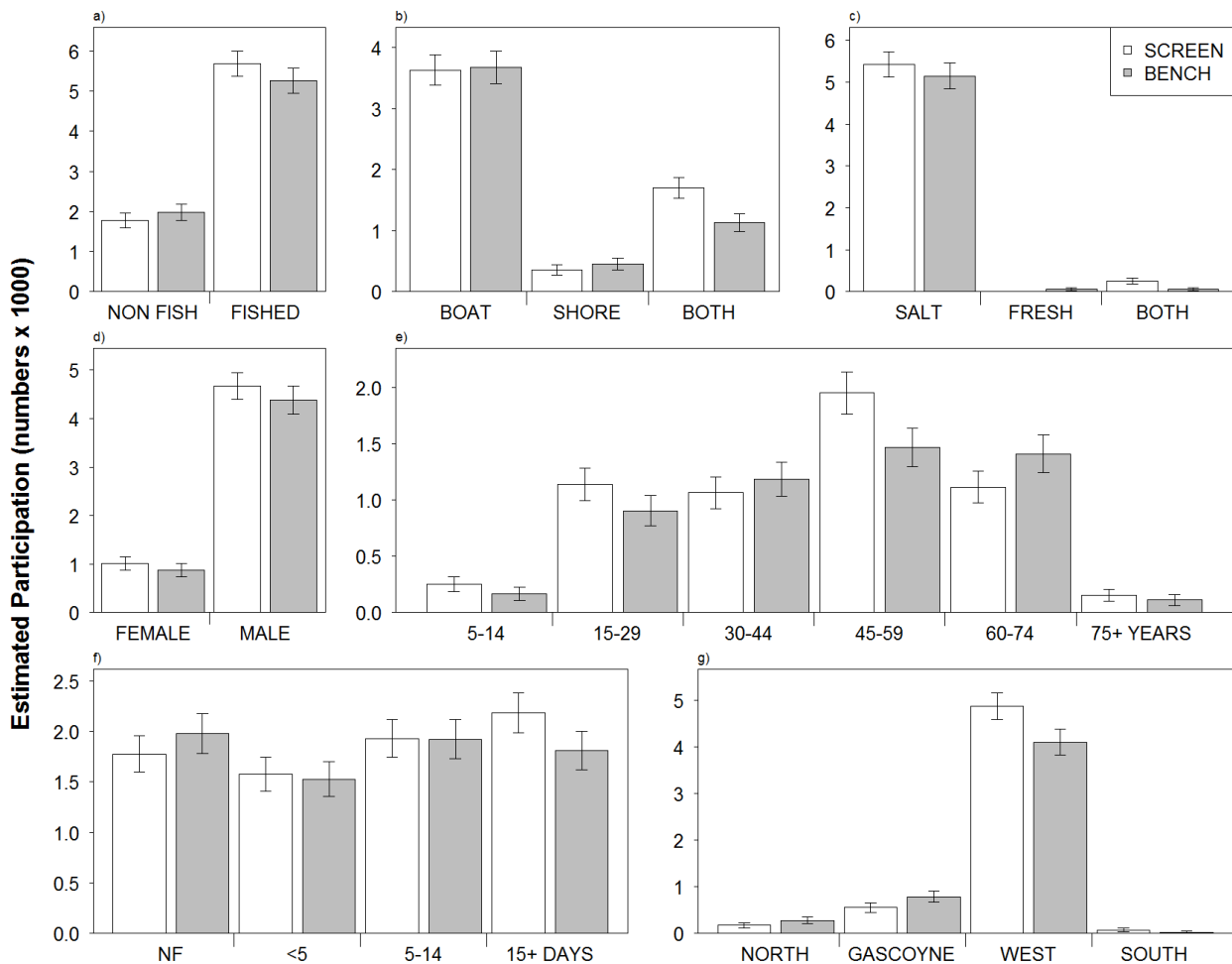
A total of 2,247 residents in the Gascoyne RDC held a RBFL in the 12 months prior to September 2017 (Figure 4), with an estimated 1,755 (78%) fishing at least once in 2016/17 (Figure 9a). Similarly, 2,264 residents held a RBFL in the 12 months prior to September 2018 (Figure 5), with an estimated 1,583 (70%) fishing at least once in 2017/18. Males accounted for the majority of RBFL holders (79% in 2016/17 and 75% in 2017/18), and higher proportions of females participated in fishing (21% in 2016/17 and 25% in 2017/18; Figure 9d) compared with statewide estimates. Most RBFL holders that fished were in the 30 to 44-year age group (26% in 2016/17 and 32% in 2017/18) or the 45 to 59-year age group (28% in 2016/17 and 31% in 2017/18; Figure 9e). RBFL holders were most likely to recall fishing 15 days or more (48% in 2016/17 and 53% in 2017/18; Figure 9f), and most likely to fish in the Gascoyne Coast (94% in 2016/17 and 93% in 2017/18; Figure 9g).



**Figure 9.** Estimated number of Gascoyne RDC residents (RBFL holders aged five years and older) who fished recreationally in the 12-months prior to September 2017 (white bars) and September 2018 (grey bars); a) non-fishers and fishers; b) boat-based and both (including shore-based); c) marine and freshwater; d) gender; e) age (years); f) avidity (days fished per year); and g) bioregion fished.

### 3.5 Mid West

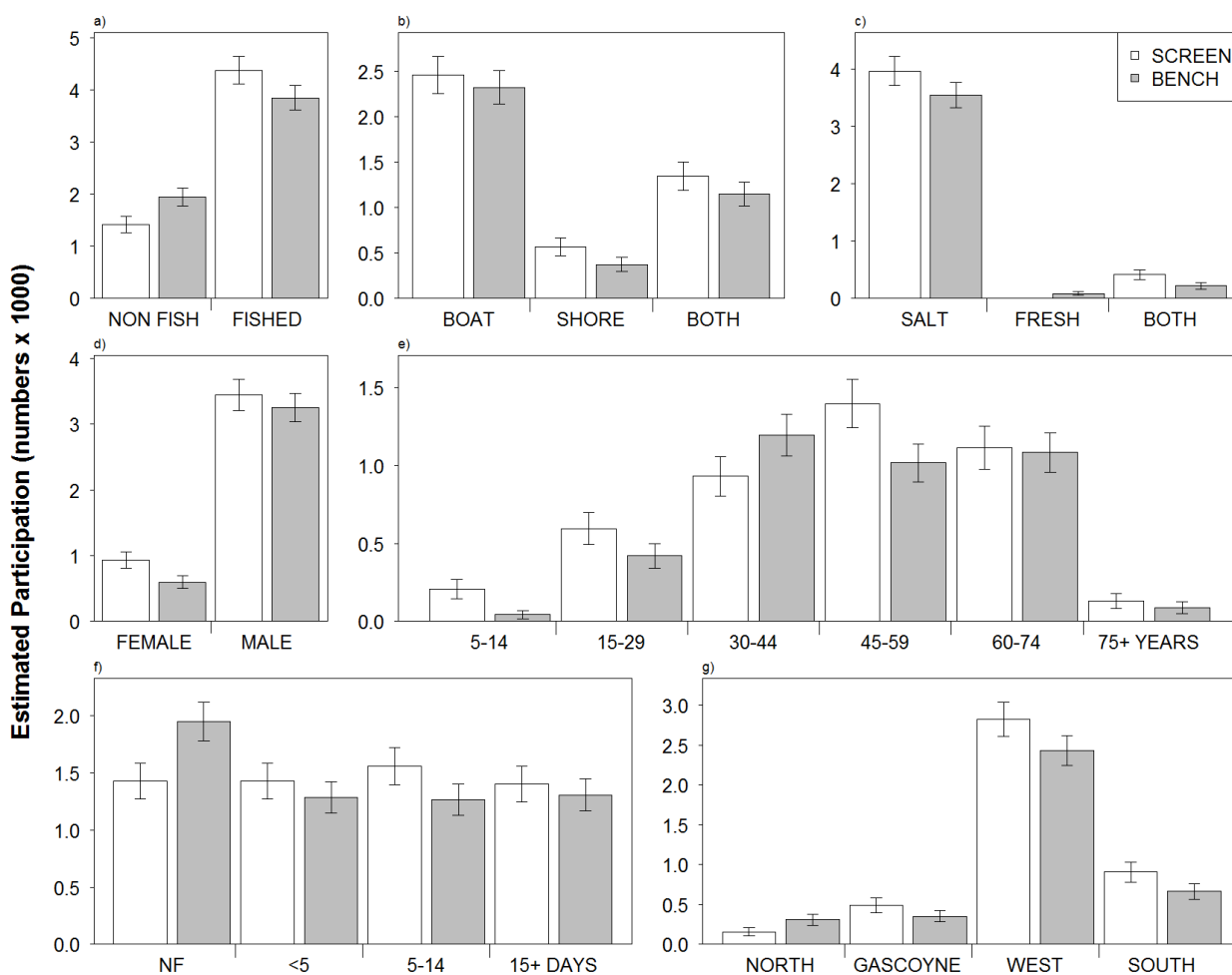
A total of 7,461 residents in the Mid West RDC held a RBFL in the 12 months prior to September 2017 (Figure 4), with an estimated 5,685 (76%) fishing at least once in 2016/17 (Figure 10a). Similarly, 7,239 residents held a RBFL in the 12 months prior to September 2018 (Figure 5), with an estimated 5,260 (73%) fishing at least once in 2017/18. Males accounted for the majority of RBFL holders (82% in 2016/17 and 83% in 2017/18), and lower proportions of females participated in fishing (18% in 2016/17 and 17% in 2017/18; Figure 10d) consistent with statewide estimates. Most RBFL holders were in the 45 to 59-year age group (34% in 2016/17 and 28% in 2017/18; Figure 10e); recalled fishing 5 to 14 days (34% in 2016/17 and 37% in 2017/18) or 15 days or more (38% in 2016/17 and 34% in 2017/18; Figure 10f); and most likely to recall fishing in the West Coast (86% in 2016/17 and 79% in 2017/18; Figure 10g).



**Figure 10.** Estimated number of Mid West RDC residents (RBFL holders aged five years and older) who fished recreationally in the 12-months prior to September 2017 (white bars) and September 2018 (grey bars); a) non-fishers and fishers; b) boat-based and both (including shore-based); c) marine and freshwater; d) gender; e) age (years); f) avidity (days fished per year); and g) bioregion fished.

### 3.6 Wheatbelt

A total of 5,803 residents in the Wheatbelt RDC held a RBFL in the 12 months prior to September 2017 (Figure 4), with an estimated 4,378 (75%) fishing at least once in 2016/17 (Figure 11a). A total of 5,800 residents held a RBFL in the 12 months prior to September 2018 (Figure 5), with an estimated 3,852 (66%) fishing at least once in 2017/18. Most fishers were male (79% in 2016/17 and 84% in 2017/18), and higher proportions of females fished (21% in 2016/17 and 16% in 2017/18; Figure 11d) compared with statewide estimates. Most RBFL holders were in the 30 to 44 age group (31% in 2017/18), or the 45 to 59-year age group (32% in 2016/17; Figure 11e). RBFL holders were equally likely to recall fishing less than 5 days (33% in 2016/17 and 2017/18) or 5 to 14 days (36% in 2016/17) or 15 days or more (34% in 2017/18; Figure 11f). The majority of RBFL holders fished in the West Coast (64% in 2016/17 and 65% in 2017/18; Figure 11g).

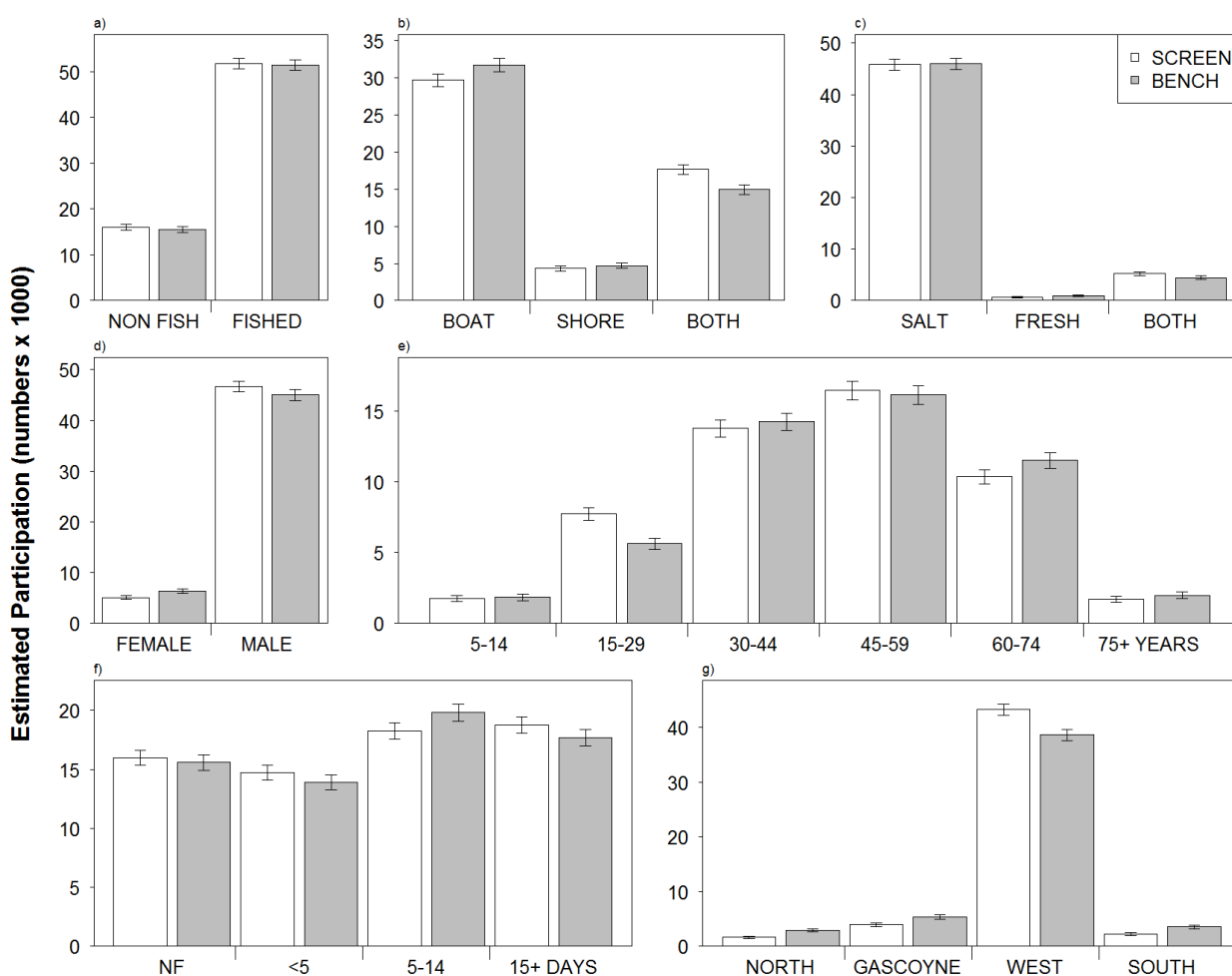


**Figure 11.** Estimated number of Wheatbelt RDC residents (RBFL holders aged five years and older) who fished recreationally in the 12-months prior to September 2017 (white bars) and September 2018 (grey bars); a) non-fishers and fishers; b) boat-based and both (including shore-based); c) marine and freshwater; d) gender; e) age (years); f) avidity (days fished per year); and g) bioregion fished.



### 3.7 Perth Metropolitan

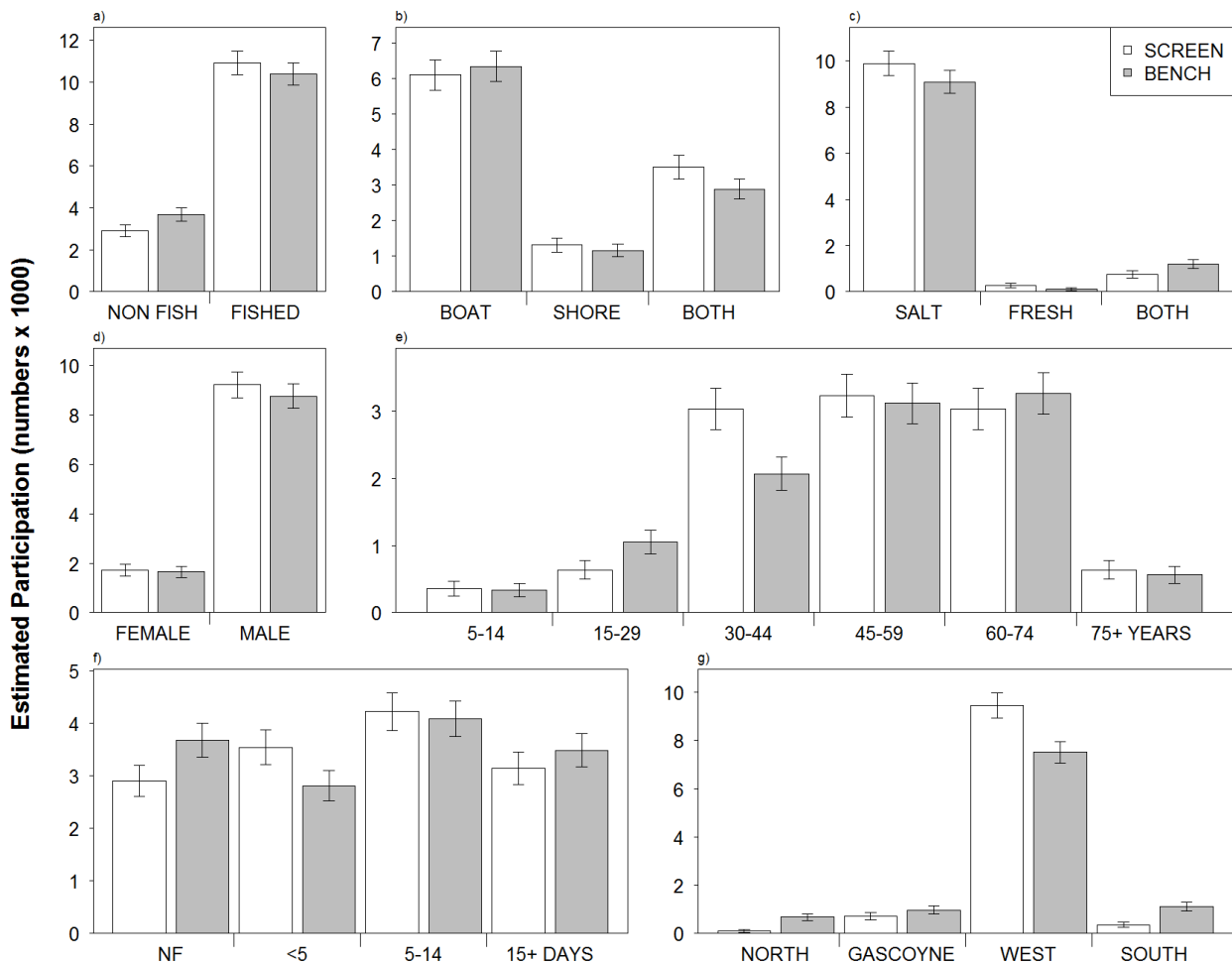
A total of 67,696 residents in Perth Metropolitan held a RBFL in the 12 months prior to September 2017 (Figure 4), with an estimated 51,723 (76%) fishing at least once in 2016/17 (Figure 12a). Similarly, 66,923 residents in Perth Metropolitan held a RBFL in the 12 months prior to September 2018 (Figure 5), with an estimated 51,353 (77%) fishing at least once in 2017/18. Males accounted for the majority of RBFL holders (90% in 2016/17 and 88% in 2017/18), and lower proportions of females participated in fishing (10% in 2016/17 and 12% in 2017/18, Figure 12d) consistent with statewide estimates. Most RBFL holders were in the 45 to 59-year age group (32% in 2016/17 and 31% in 2017/18; Figure 12e). RBFL holders were most likely to recall fishing 5 to 14 days (35% in 2016/17 and 39% in 2017/18) or 15 days or more (36% in 2016/17 and 34% in 2017/18; Figure 12f). RBFL holders were most likely to recall fishing in the West Coast (85% in 2016/17 and 77% in 2017/18; Figure 12g).



**Figure 12.** Estimated number of Perth Metropolitan residents (RBFL holders aged five years and older) who fished recreationally in the 12-months prior to September 2017 (white bars) and September 2018 (grey bars); a) non-fishers and fishers; b) boat-based and both (including shore-based); c) marine and freshwater; d) gender; e) age (years); f) avidity (days fished per year); and g) bioregion fished.

### 3.8 Peel

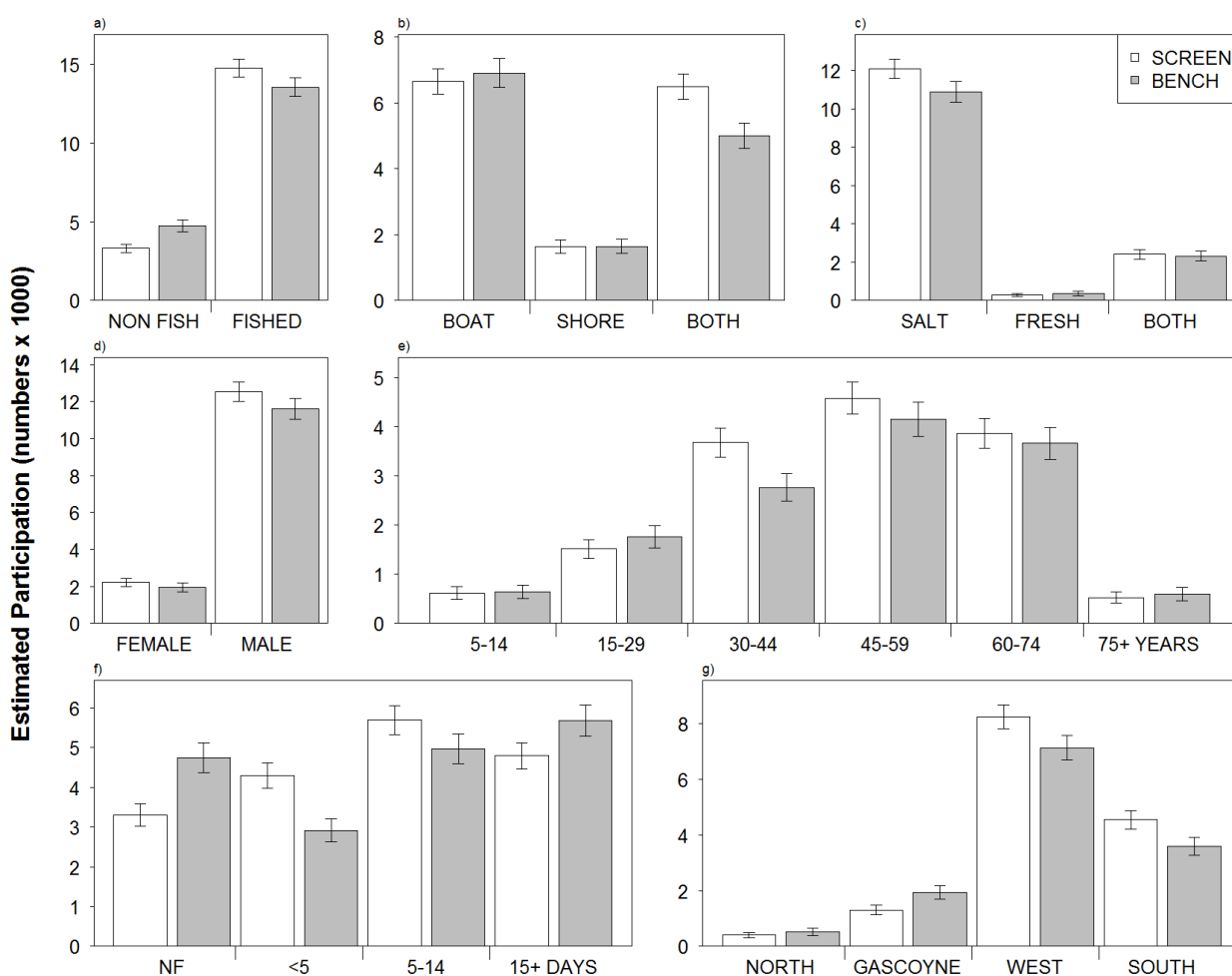
A total of 13,829 residents in the Peel RDC held a RBFL in the 12 months prior to September 2017 (Figure 4), with an estimated 10,920 (79%) fishing at least once in 2016/17 (Figure 13a). Similarly, 14,072 residents held a RBFL in the 12 months prior to September 2018 (Figure 5), with an estimated 10,395 (74%) fishing at least once in 2017/18. Most RBFL holders were male (84% in 2016/17 and 2017/18), and higher proportions of females participated in fishing (16% in 2016/17 and 2017/18; Figure 13d) compared with statewide estimates. Most RBFL holders were in the 45 to 59-year age group (30% in 2016/17 and 2017/18), followed by the 60 to 74-year age group (28% in 2016/17 and 31% in 2017/18; Figure 13e). RBFL holders were most likely to recall fishing 5 to 14 days (39% in 2016/17 and 2017/18; Figure 13f), and most likely to recall fishing in the West Coast (89% in 2016/17 and 73% in 2017/18; Figure 13g).



**Figure 13.** Estimated number of Peel RDC residents (RBFL holders aged five years and older) who fished recreationally in the 12-months prior to September 2017 (white bars) and September 2018 (grey bars); a) non-fishers and fishers; b) boat-based and both (including shore-based); c) marine and freshwater; d) gender; e) age (years); f) avidity (days fished per year); and g) bioregion fished.

### 3.9 South West

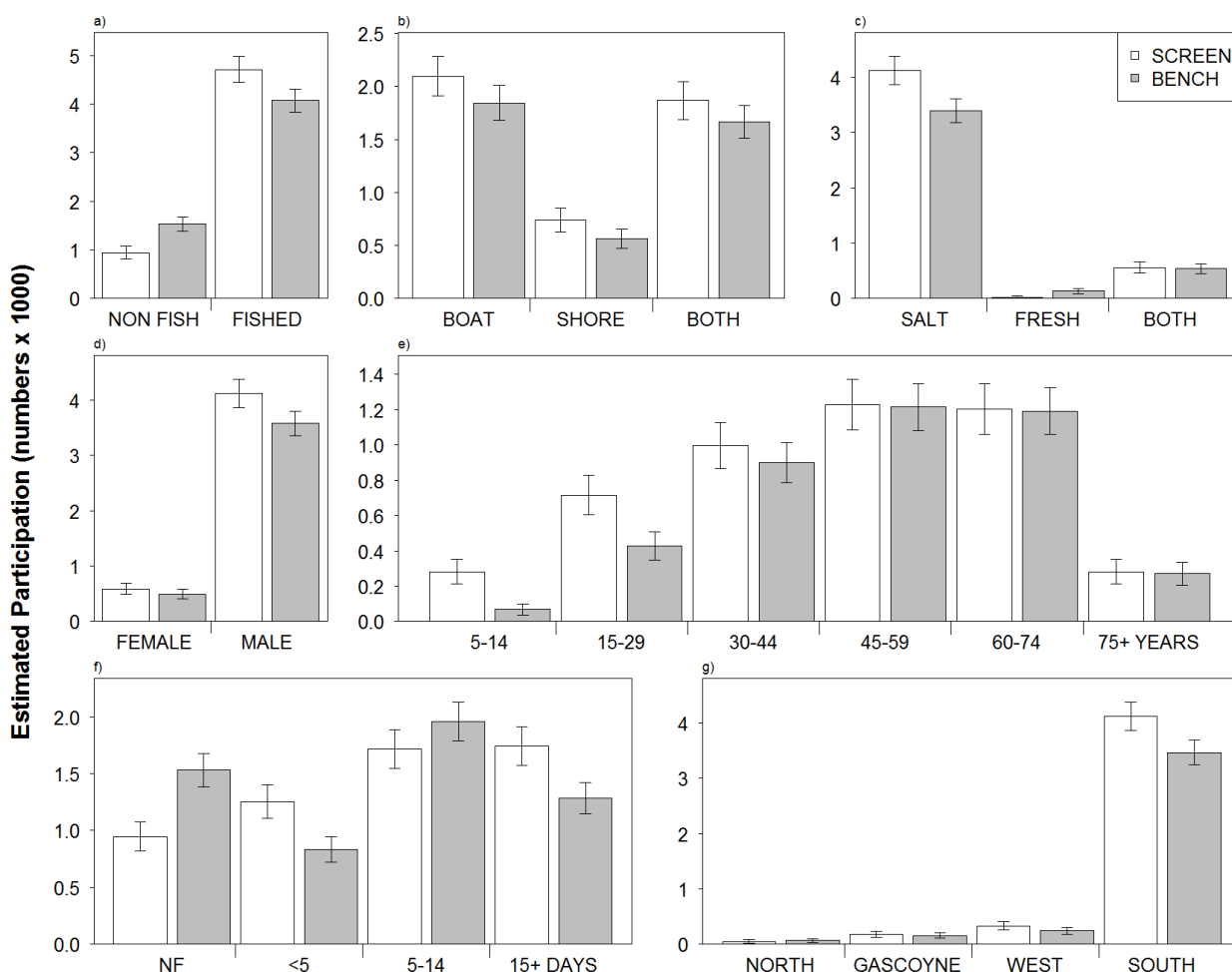
A total of 18,075 residents in the South West RDC held a RBFL in the 12 months prior to September 2017 (Figure 4), with an estimated 14,769 (82%) fishing at least once in 2016/17 (Figure 14a). A total of 18,294 residents held a RBFL in the 12 months prior to September 2018 (Figure 5), with an estimated 13,552 (74%) fishing at least once in 2017/18. Males accounted for the majority of RBFL holders (85% in 2016/17 and 86% in 2017/18), and higher proportions of females participated in fishing (15% in 2016/17 and 14% in 2017/18; Figure 14d) compared with statewide estimates. Most RBFL holders were in the 45 to 59-year age group (31% in 2016/17 and 28% in 2017/18; Figure 14e). RBFL holders were most likely to recall fishing 5 to 14 days (38% in 2016/17 and 37% in 2017/18) or 15 days or more (32% in 2016/17 and 42% in 2017/18; Figure 14f), and fished in the West Coast (57% in 2016/17 and 54% in 2017/18), followed by the South Coast (31% in 2016/17 and 27% in 2017/18; Figure 14g).



**Figure 14.** Estimated number of South West RDC residents (RBFL holders aged five years and older) who fished recreationally in the 12-months prior to September 2017 (white bars) and September 2018 (grey bars); a) non-fishers and fishers; b) boat-based and both (including shore-based); c) marine and freshwater; d) gender; e) age (years); f) avidity (days fished per year); and g) bioregion fished.

### 3.10 Great Southern

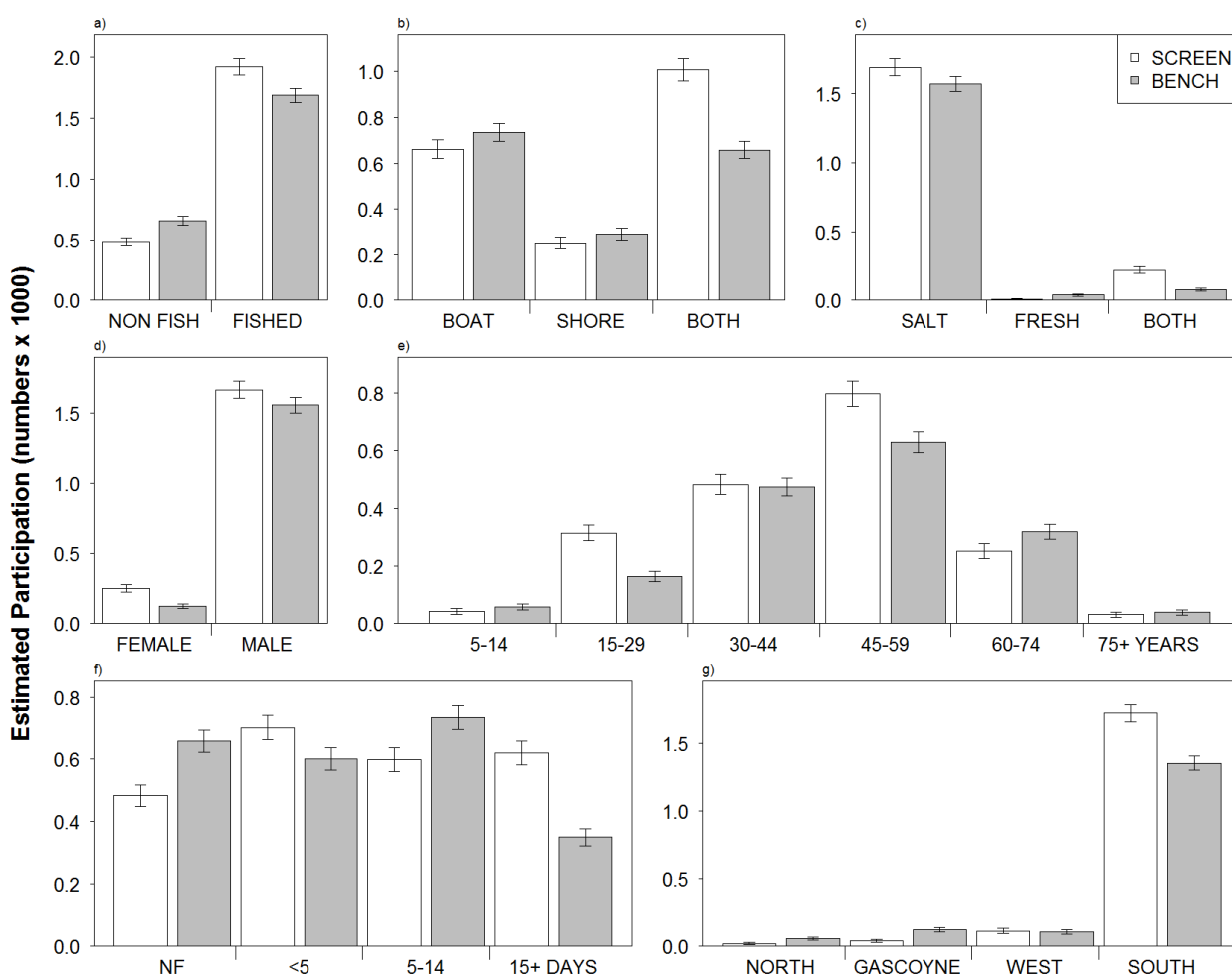
A total of 5,653 residents in the Great Southern RDC held a RBFL in the 12 months prior to September 2017 (Figure 4), with an estimated 4,707 (83%) fishing at least once in 2016/17 (Figure 15a). A total of 5,601 residents held a RBFL in the 12 months prior to September 2018 (Figure 5), with an estimated 4,071 (73%) fishing at least once in 2017/18. Males accounted for the majority of RBFL holders (88% in 2016/17 and 2017/18), and lower proportions of females participated in fishing (12% in 2016/17 and 2017/18; Figure 15d) consistent with statewide estimates. Most RBFL holders were in the 45 to 59-year age group (26% in 2016/17 and 30% in 2017/18; Figure 15e). RBFL holders were most likely to recall fishing 5 to 14 days (36% in 2016/17 and 48% in 2017/18) or 15 days or more (37% in 2016/17 and 31% in 2017/18; Figure 15f), and most likely to recall fishing in the South Coast (88% in 2016/17 and 2017/18; Figure 15g).



**Figure 15.** Estimated number of Great Southern RDC residents (RBFL holders aged five years and older) who fished recreationally in the 12-months prior to September 2017 (white bars) and September 2018 (grey bars); a) non-fishers and fishers; b) boat-based and both (including shore-based); c) marine and freshwater; d) gender; e) age (years); f) avidity (days fished per year); and g) bioregion fished.

### 3.11 Goldfields-Esperance

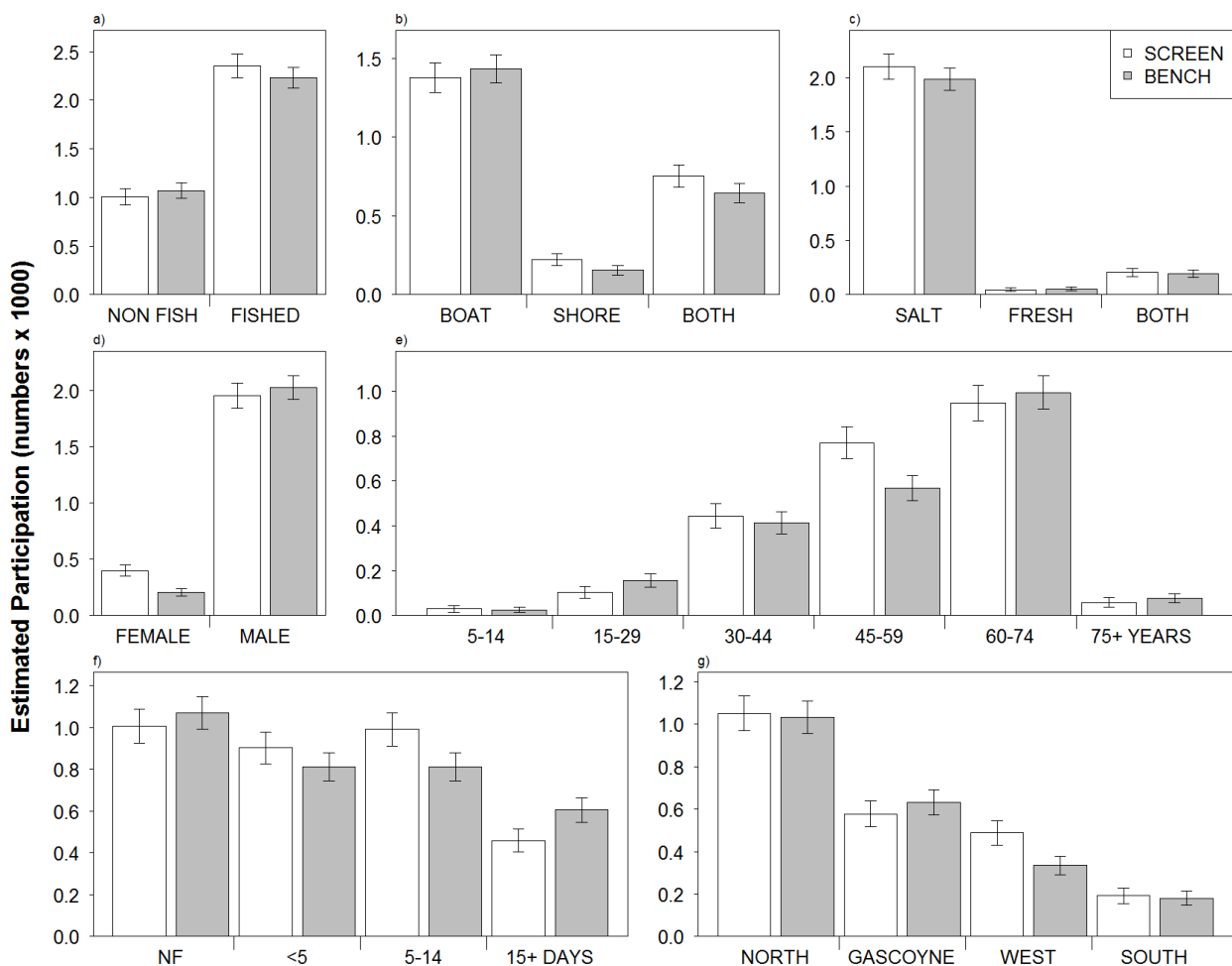
A total of 2,402 residents in the Goldfields-Esperance RDC held a RBFL in the 12 months prior to September 2017 (Figure 4), with an estimated 1,920 (80%) fishing at least once in 2016/17 (Figure 16a). A total of 2,342 residents held a RBFL in the 12 months prior to September 2018 (Figure 5), with an estimated 1,684 (72%) fishing at least once in 2017/18. Males accounted for the majority of RBFL holders (87% in 2016/17 and 93% in 2017/18), and lower proportions of females participated in fishing (13% in 2016/17 and 7% in 2017/18; Figure 16d) compared with statewide estimates. Most RBFL holders were in the 45 to 59-year age group (42% in 2016/17 and 37% in 2017/18; Figure 16e). RBFL holders were most likely to recall fishing less than 5 days (37% in 2016/17 and 36% in 2017/18) or 5 to 14 days (31% in 2016/17 and 44% in 2017/18; Figure 16f). RBFL holders were most likely to recall fishing in the South Coast (91% in 2016/17 and 82% in 2017/18; Figure 16g).



**Figure 16.** Estimated number of Goldfields-Esperance RDC residents (RBFL holders aged five years and older) who fished recreationally in the 12-months prior to September 2017 (white bars) and September 2018 (grey bars); a) non-fishers and fishers; b) boat-based and both (including shore-based); c) marine and freshwater; d) gender; e) age (years); f) avidity (days fished per year); and g) bioregion fished.

### 3.12 Interstate

A total of 3,360 interstate visitors held a RBFL in the 12 months prior to September 2017 (Figure 4), with an estimated 2,353 (70%) fishing at least once in 2016/17 (Figure 17a). Similarly, 3,304 interstate visitors held a RBFL in the 12 months prior to September 2018 (Figure 5), with an estimated 2,233 (68%) fishing at least once in 2017/18. Males accounted for the majority of RBFL holders in 2016/17 and 2017/18 (83% and 91% respectively), and lower proportions of females participated in fishing in 2016/17 and 2017/18 (17% and 9% respectively; Figure 17d) compared with statewide estimates. Most RBFL holders were in the 60 to 74-year age group (40% in 2016/17 and 45% in 2017/18; Figure 17e). RBFL holders were most likely to recall fishing 5 to 14 days (42% in 2016/17 and 36% in 2017/18) or less than 5 days (38% in 2016/17 and 36% in 2017/18; Figure 17f), and most likely to recall fishing in the North Coast (46% in 2016/17 and 47% in 2017/18), followed by the Gascoyne Coast (25% in 2016/17 and 29% in 2017/18; Figure 17g).



**Figure 17.** Estimated number of interstate residents (RBFL holders aged five years and older) who fished recreationally in the 12-months prior to September 2017 (white bars) and September 2018 (grey bars); a) non-fishers and fishers; b) boat-based and both (including shore-based); c) marine and freshwater; d) gender; e) age (years); f) avidity (days fished per year); and g) bioregion fished.

## 4 Fishing Effort

This section presents estimates of effort from boat-based recreational fishing for the 12-months from September 2017 to August 2018. Estimates are summarised for the state (Figure 18) and for each bioregion: North Coast (Figure 19), Gascoyne Coast (Figure 20), West Coast (Figure 21) and South Coast (Figure 22), by habitat, fishing method and month.

Estimates of effort are measured in boat days (separate days in which fishing occurred on a ‘boat party’ basis, regardless of the number of fishers or RBFL holders on board) and number of fishing events, which accounts for multiple events during a boat day (i.e. where the fishing method or location fished changed during the boat day).

Boat-based recreational fishing effort for the 12-months from September 2017 to August 2018 was estimated to be 408,105 boat days, with 433,515 separate fishing events (Table 3). Fishers undertook an average of 1.06 events per fisher day statewide. The estimated total time spent boat-based recreational fishing was 1,159,489 hours.

Statewide effort increased in 2017/18 with approximately three quarters of the statewide estimated total effort (in boat days, fishing events and hours fished) reported from the West Coast. The estimated boat-based recreational fishing effort in 2017/18 was higher in the West Coast compared with 2015/16 and 2013/14, but was similar to estimated effort in 2011/12 (Table 3). Estimated boat-based recreational fishing effort in 2017/18 in the North Coast, Gascoyne Coast and South Coast was similar to estimated effort in 2015/16, but lower than 2013/14 and 2011/12 (Table 3).

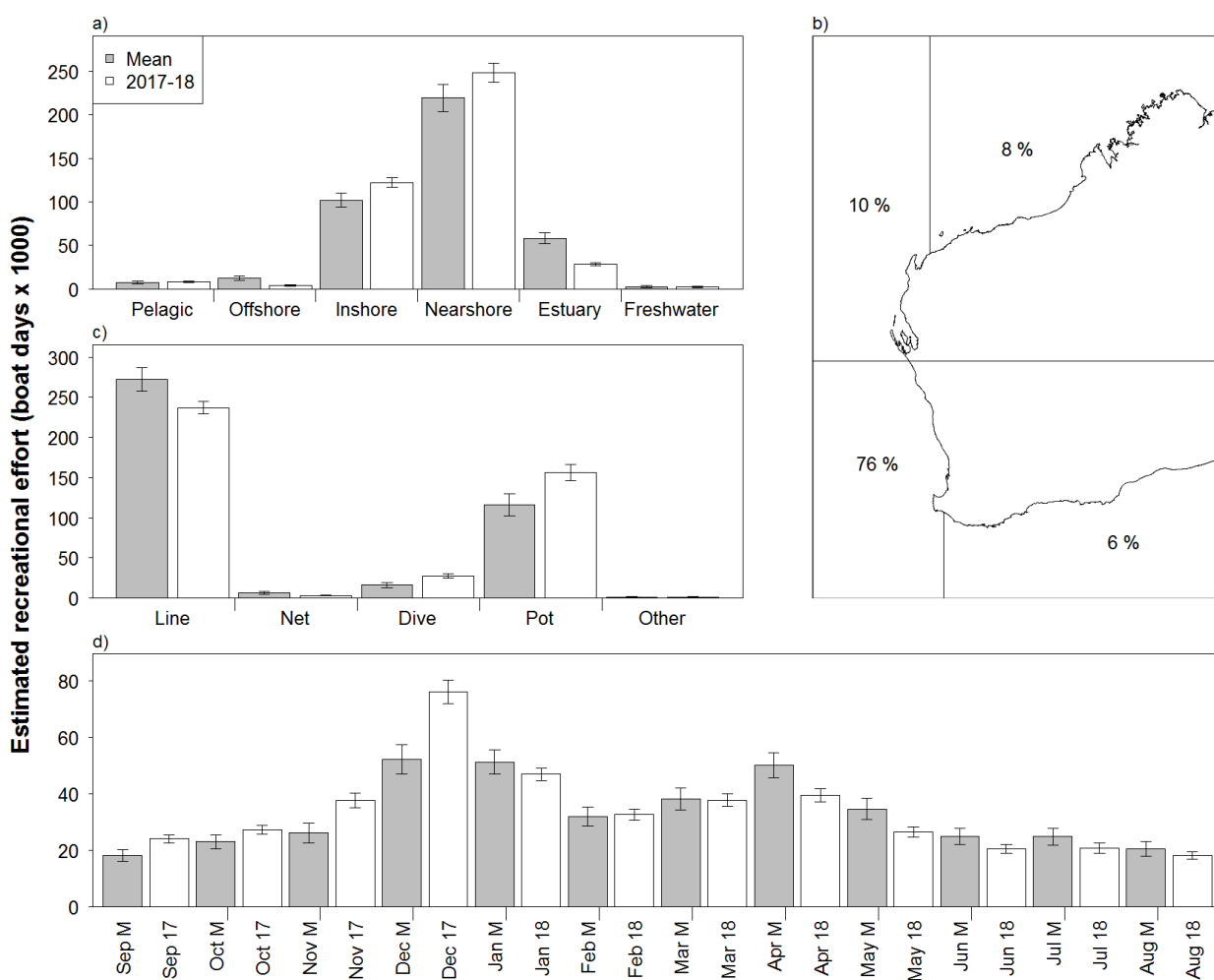
**Table 3.** Annual fishing effort, expressed as boat days and fishing events, for boat-based recreational fishing in Western Australia during 2011/12, 2013/14, 2015/16 and 2017/18 (se=standard error).

<b>Bioregion</b>	<b>Boat Days</b>		<b>Fishing Events</b>		<b>Hours Fished</b>	
		<b>se</b>		<b>se</b>		<b>se</b>
<b>2011/12</b>						
North Coast	47,721	3,778	51,175	4,306	187,112	14,105
Gascoyne Coast	58,123	3,672	61,616	3,895	253,930	17,245
West Coast	293,112	10,688	317,543	11,972	820,693	31,111
South Coast	40,073	3,354	41,897	3,556	136,771	12,505
<b>Statewide Total</b>	<b>439,029</b>	<b>11,160</b>	<b>472,232</b>	<b>12,521</b>	<b>1,400,150</b>	<b>41,700</b>
<b>2013/14</b>						
North Coast	45,604	3,603	47,836	3,757	188,744	15,536
Gascoyne Coast	53,832	3,603	56,334	3,849	211,967	15,671
West Coast	249,719	10,563	267,664	11,561	716,722	31,145
South Coast	28,277	2,323	29,831	2,497	91,640	7,447
<b>Statewide Total</b>	<b>383,107</b>	<b>12,385</b>	<b>401,730</b>	<b>13,197</b>	<b>1,209,263</b>	<b>40,279</b>
<b>2015/16</b>						
North Coast	31,375	2,414	33,046	2,520	122,192	9,748
Gascoyne Coast	43,237	3,152	44,407	3,234	169,312	12,914
West Coast	271,311	11,032	285,157	11,672	740,815	28,047
South Coast	24,444	2,042	25,097	2,100	80,260	6,762
<b>Statewide Total</b>	<b>370,368</b>	<b>11,567</b>	<b>387,707</b>	<b>12,191</b>	<b>1,112,579</b>	<b>32,731</b>
<b>2017/18</b>						
North Coast	32,964	2,574	34,164	2,661	130,060	10,616
Gascoyne Coast	42,186	3,078	43,905	3,205	176,685	13,674
West Coast	311,495	12,127	332,984	13,087	772,470	28,204
South Coast	21,460	1,680	22,463	1,754	80,274	7,244
<b>Statewide Total</b>	<b>408,105</b>	<b>12,573</b>	<b>433,515</b>	<b>13,533</b>	<b>1,159,489</b>	<b>34,155</b>



## 4.1 Statewide

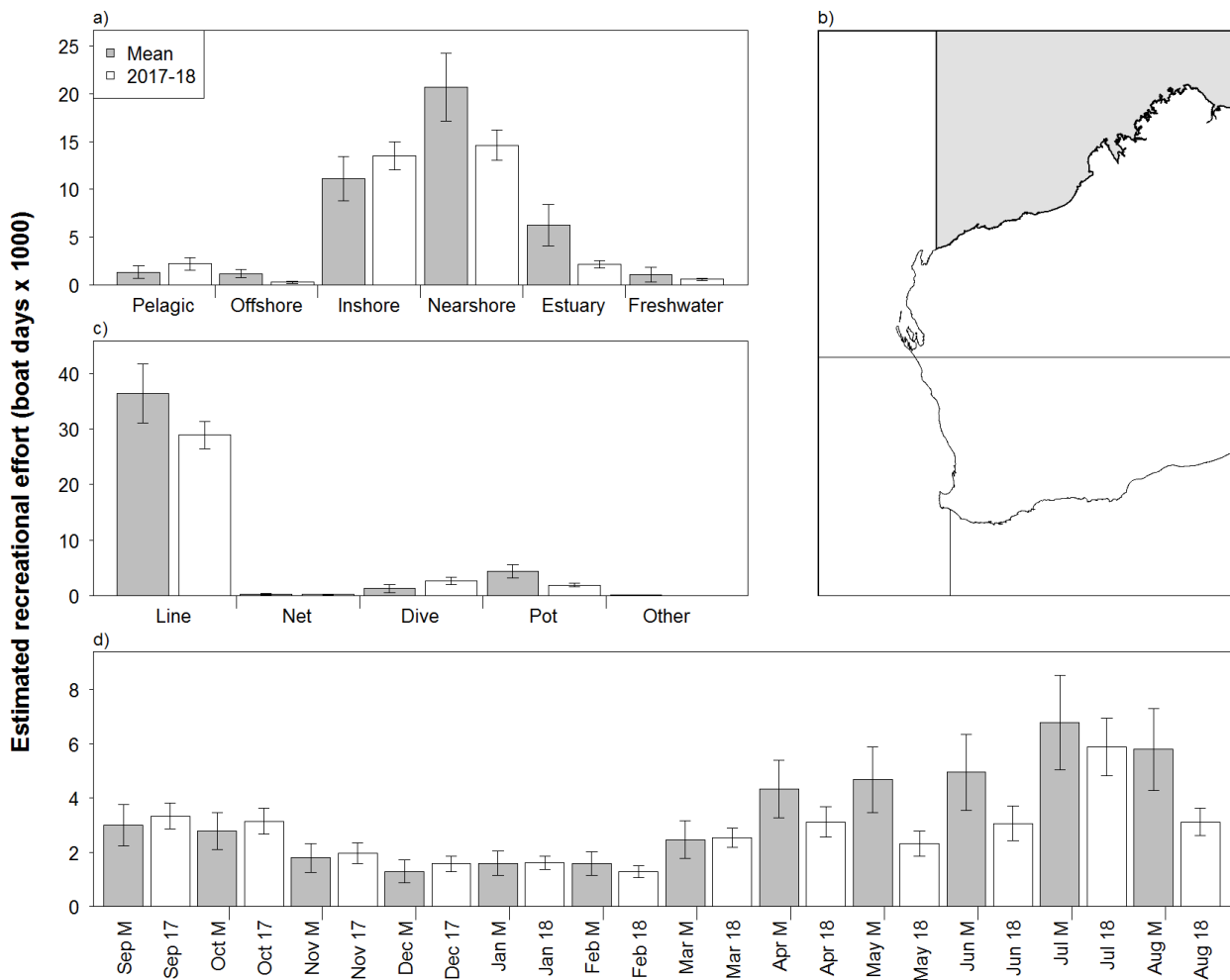
At a statewide level, most boat-based recreational fishing effort (boat days) during 2017/18 occurred in the West Coast (76%), with lower proportions in the North Coast (8%), Gascoyne Coast (10%) and South Coast (6%; Figure 18b). Most boat-based recreational fishing effort occurred in nearshore habitat (57%), followed by inshore demersal (27%) and estuary (11%), with lower proportions in pelagic (2%), offshore demersal (2%) and freshwater (1%; Figure 18a). Most boat-based recreational fishing effort was attributed to line fishing (61%) and pots (33%), with lower proportions from diving (5%), nets (1%) and other (<1%; Figure 18c). Most boat-based recreational fishing effort occurred during summer (36%) and autumn (28%), with effort highest in December 2017 (16%) and lowest in September 2017 and August 2018 (4%; Figure 18d). Estimated effort in December 2017 was higher than the 3-year average from previous statewide surveys, as was effort for potting, and fishing in inshore demersal and nearshore habitats.



**Figure 18.** Boat-based recreational fishing effort (boat days x 1000  $\pm$  standard errors) in Western Australia during 2017/18 (white bars) compared with the mean from the 3 previous surveys (grey bars); a) effort by habitat; b) map of the proportion (%; 17/18 only) of the effort by fishing bioregion; c) effort by fishing method; and d) effort by month.

## 4.2 North Coast

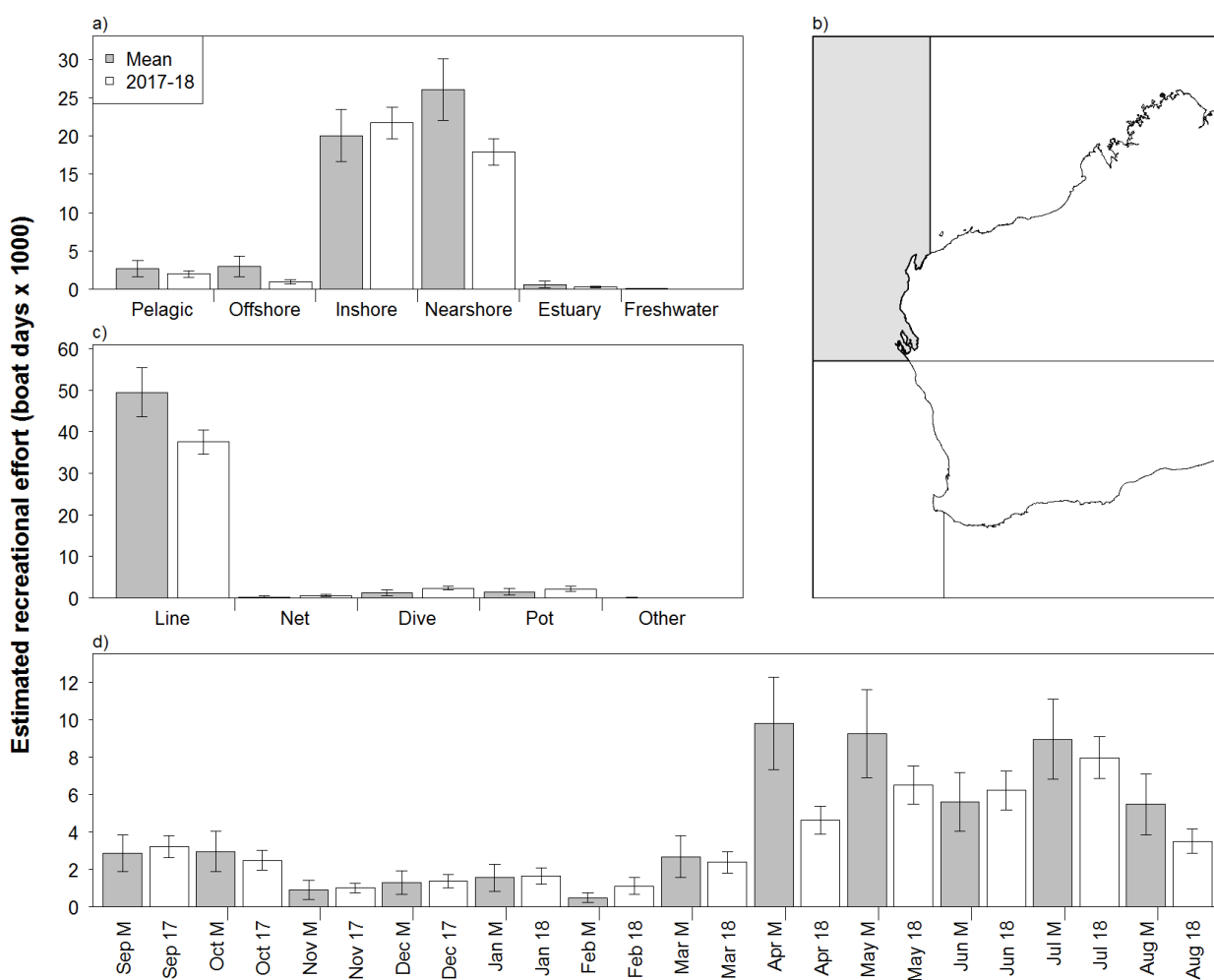
The majority of boat-based recreational fishing effort (boat days) during September 2017 to August 2018 in the North Coast occurred in nearshore habitat (47%), followed by inshore demersal (33%) and estuary (11%), with lower proportions of fishing effort in pelagic (5%), offshore demersal (2%) and freshwater (2%; Figure 19a). The majority of boat-based recreational fishing effort was attributed to line fishing (86%), with lower proportions of fishing effort from pots (8%), diving (5%), nets (<1%) and other (<1%; Figure 19b). The majority of boat-based recreational fishing effort occurred during winter (40%), followed by autumn (26%), spring (22%) and summer (12%). In 2017/18, fishing effort was highest in July 2018 (17%) and lowest for December 2017 through to February 2018 (4%; Figure 19c). Estimated boat-based recreational fishing effort was lower in the North Coast in 2017/18 compared with the 3-year average from the previous statewide surveys, notably for line fishing, nearshore and estuary habitats, and from April to August.



**Figure 19.** Boat-based recreational fishing effort (boat days  $\times$  1000  $\pm$  standard errors) in the North Coast during 2017/18 (white bars) compared with the mean from the 3 previous surveys (grey bars); a) effort by habitat; b) map of the bioregion; c) effort by fishing method; and d) effort by month.

### 4.3 Gascoyne Coast

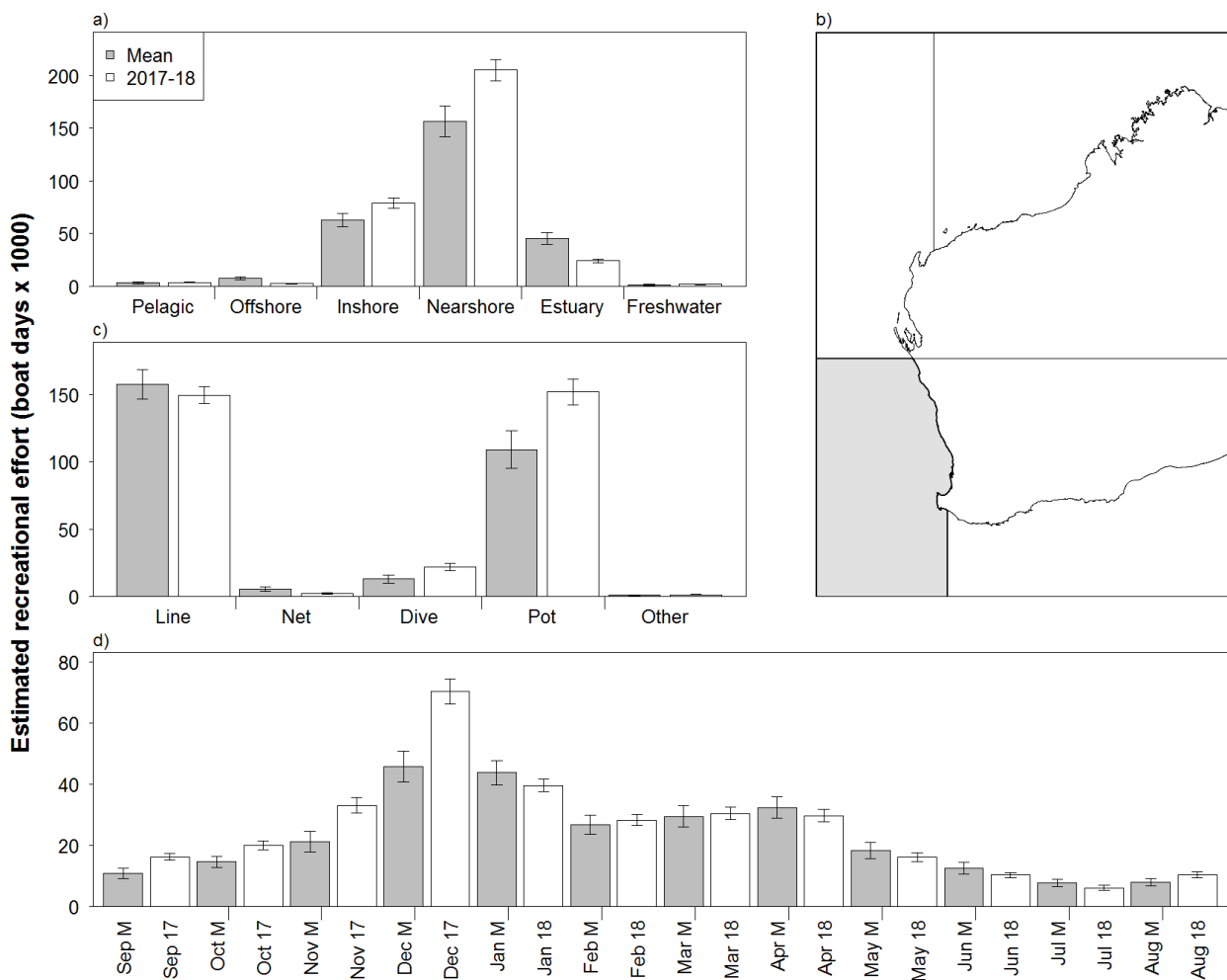
The majority of boat-based recreational fishing effort (boat days) during September 2017 to August 2018 in the Gascoyne Coast occurred in nearshore (46%) and inshore demersal (44%) habitats, with lower proportions of fishing effort in pelagic (5%), offshore demersal (4%) and estuary (1%; Figure 20a). The majority of boat-based recreational fishing effort was attributed to line fishing (91%), with lower proportions of fishing effort from diving (4%), pots (4%), nets (1%; Figure 20b). The majority of boat-based recreational fishing effort occurred during autumn (38%) and winter (40%) and was lowest in spring (14%) and summer (8%). In 2017/18, fishing effort was highest in July 2018 (18%) and lowest in November 2017 and February 2018 (2%); Figure 20c). Estimated boat-based recreational fishing effort was lower in the Gascoyne Coast in 2017/18 compared with the 3-year average from the previous statewide surveys, notably for line fishing, nearshore and offshore habitat, from April to August.



**Figure 20.** Boat-based recreational fishing effort (boat days x 1000 ± standard errors) in the Gascoyne Coast during 2017/18 (white bars) compared with the mean from the 3 previous surveys (grey bars); a) effort by habitat; b) map of the bioregion; c) effort by fishing method; and d) effort by month.

## 4.4 West Coast

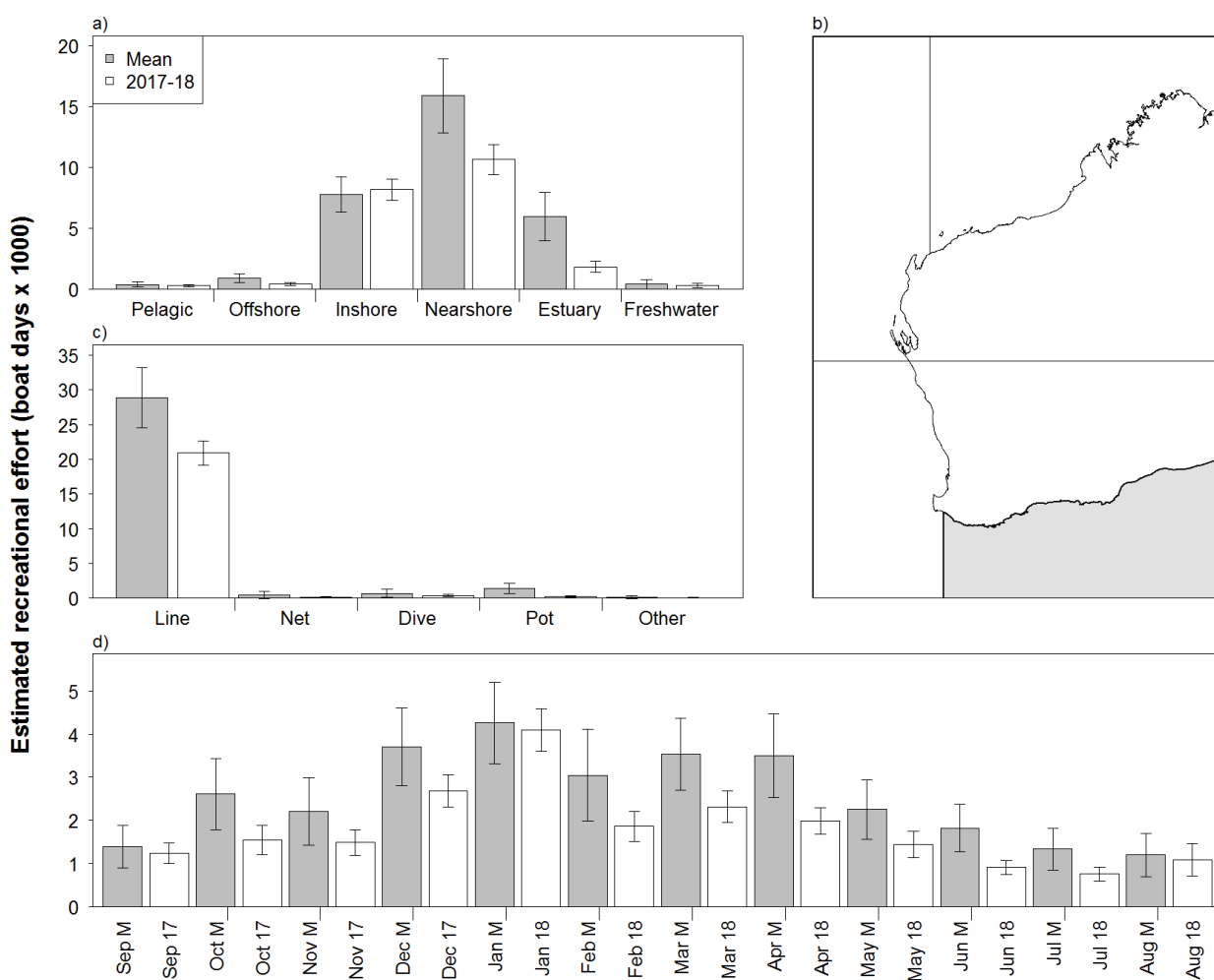
The majority of boat-based recreational fishing effort (boat days) during September 2017 to August 2018 in the West Coast occurred in nearshore habitat (61%), followed by inshore demersal (24%) and estuary (12%), with lower proportions of fishing effort in offshore demersal (2%), pelagic (1%) and freshwater (<1%; Figure 21a). The majority of boat-based recreational fishing effort was attributed to line fishing (50%) and pots (43%), with lower proportions of fishing effort from diving (6%) and nets (1%; Figure 21b). The majority of boat-based recreational fishing effort occurred during summer (44%), autumn (27%) and spring (20%) and was lowest in winter (9%). In 2017/18, fishing effort was highest in December 2017 (20%) and lowest in July 2018 (2%; Figure 21c). Estimated boat-based recreational fishing effort in the West Coast in 2017/18 was generally consistent with the 3-year average from the previous statewide surveys, with higher effort for potting, nearshore habitat, and from November to December.



**Figure 21.** Boat-based recreational fishing effort (boat days x 1000  $\pm$  standard errors) in the West Coast during 2017/18 (white bars) compared with the mean from the 3 previous surveys (grey bars); a) effort by habitat; b) map of the bioregion; c) effort by fishing method; and d) effort by month.

## 4.5 South Coast

The majority of boat-based recreational fishing effort (boat days) during September 2017 to August 2018 in the South Coast occurred in nearshore habitat (50%), followed by inshore demersal (30%) and estuary (15%), with lower proportions of fishing effort in offshore demersal (3%), freshwater (1%) and pelagic (1%; Figure 22a). The majority of boat-based recreational fishing effort was attributed to line fishing (94%), with lower proportions of fishing effort from pots (3%), diving (2%) and nets (1%; Figure 22b). The majority of boat-based recreational fishing effort occurred during summer (37%), followed by autumn (29%) and spring (20%) and was lowest in winter (14%). In 2017/18, fishing effort was highest in January 2018 (16%) and lowest in July and August 2018 (4%; Figure 22c). Estimated effort was lower in the South Coast in 2017/18 compared with the 3-year average from the previous statewide surveys, notably for line fishing, nearshore and estuary habitats.



**Figure 22.** Boat-based recreational fishing effort (boat days  $\times$  1000  $\pm$  standard errors) in the South Coast during 2017/18 (white bars) compared with the mean from the 3 previous surveys (grey bars); a) effort by habitat; b) map of the bioregion; c) effort by fishing method; and d) effort by month.

## 5 Statewide Estimates of Recreational Catch

This section presents estimates of boat-based recreational catch for the 12-months from September 2017 to August 2018. Estimates presented for all species include: annual catch (total, kept and released, by number), proportions released (% released) and reasons for release.

### 5.1 Annual Catch (Total, Kept and Released Numbers)

The estimated annual catch (total, kept and released numbers) and proportion released for the 12-months from September 2017 to August 2018 is given in Table 4. A diverse range of species/taxa were caught, including scalefish (186 species/taxa), elasmobranchs (18), crustaceans (seven) and molluscs (five). A total of 2.82 million individual species/taxa were caught. A similar proportion of the catch was either kept (approx. 1.52 million or 54%) or released (approx. 1.30 million or 46%). Approximately 47% of the recreational catch comprised finfish (1.32 million) in comparison to invertebrates (1.50 million or 53%). A similar proportion of finfish (49%) and invertebrates (44%) were released.

School Whiting (*Sillago bassensis*, *S. vittata* and *S. schomburgkii*) were the most commonly caught finfish species statewide with (259,359 kept or released statewide by number, or 19% of the finfish catch), followed by Australian Herring (*Arripis georgianus*; 119,545 or 9%), Pink Snapper (*Chrysophrys auratus*; 116,091 or 9%), West Australian Dhufish (*Glaucosoma hebraicum*; 67,842 or 5%), King George Whiting (*Sillaginodes punctata*; 52,649 or 4%), Silver Trevally (*Pseudocaranx* spp. complex; 45,913 or 3%), Grass Emperor (*Lethrinus laticaudis*; 36,996 or 3%), Western King Wrasse (*Coris auricularis*; 35,413 or 3%), Black Bream (*Acanthopagrus butcheri*; 31,599 or 2%), Brownspotted Wrasse (*Notolabrus parilus*; 26,084 or 2%), Baldchin Groper (*Choerodon rubescens*; 25,669 or 2%) and Breaksea Cod (*Epinephelides armatus*; 25,471 or 2%).

High release rates were observed for many of these species, including Brownspotted Wrasse (85%), Western King Wrasse (85%), Black Bream (80%), Pink Snapper (73%), Grass Emperor (63%) and West Australian Dhufish (59%). Release rates were lower for Silver Trevally (44%), Breaksea Cod (38%), Baldchin Groper (35%), School Whiting (24%), Australian Herring (21%) and King George Whiting (20%).

Western Rock Lobster (*Panulirus cygnus*) was the most commonly caught invertebrate species (695,433 kept or released statewide by number, or 47% of the invertebrate catch), followed by Blue Swimmer Crab (*Portunus armatus*; 666,526 or 45%) and Squid (Order Teuthoidea; 88,519 or 6%). High release rates were observed for Blue Swimmer Crab (58%) compared with Western Rock Lobster (35%) and Squid (3%).

### 5.2 Release Rates

A summary of release rates for species released by fishers during 2017/18 by RBFL holders aged five years or older is given Table 5. Lowest release rates were observed for Octopus (16%), Blue Morwong (17%), Yellowfin Whiting (17%), Robinson's Seabream (19%), Harlequin Fish (19%),

King George Whiting (20%), Australian Herring (21%), Western Blue Groper (23%) and School Whiting (24%).

Highest release rates were observed for Gurnard (90%), Yellowtail Flathead (91%), Bighead Gurnard Perch (94%), Western Blue Devil (94%), Sea Trumpeter (94%), Weeping Toadfish (95%), Western Striped Grunter (95%), Dusky Whaler (96%), Giant Sea Catfish (99%), Port Jackson Shark (100%) and Western Shovelnose Ray (100%).

### **5.3 Reasons for Release**

A summary of the proportions for common reasons for release during 2017/18 is given in Table 6. The most common reasons for release were: “Too Small” (personal preference), “Undersize” (below legal limit), “Too Many” (personal preference), “Over Limit” (Above legal bag limit), “Catch Release” (sport fishing) and “Other”, which includes protected females and species.

“Too Small” includes catches that are too small in terms of personal preference, not related to regulations. This reason for release occurred in proportions of 30% or more for Australian Herring, Bight Redfish, Golden Snapper, Saddletail Snapper, School Whiting and Western Blue Groper.

“Under Size” includes catches below the legal size. This reason for release occurred in proportions of 60% or more for Baldchin Groper, Blackspot Tuskfish, Blue Swimmer Crab, Blue Tuskfish, Breaksea Cod, Coral Trout, Goldband Snapper, Grass Emperor, King George Whiting, Pink Snapper, Southern Bluespotted Flathead, Spangled Emperor, Stripey Snapper, West Australian Dhufish and Yellowtail Flathead.

“Too Many” includes catches the fisher did not want/need anymore/any, had enough, not wanted, not targeted, no preference. This reason for release occurred in proportions of 40% or more for Blue Threadfin, Cuttlefish, Dusky Whaler, Gummy Sharks, Octopus, Port Jackson Shark, Sea Sweep, Western Blue Devil and Yellowspotted Rockcod.

“Over Limit” includes catches above the legal bag limit. This reason for release did not occur in proportions greater than 20%, except for Crimson Snapper (23%) and Harlequin Fish (20%). “Over Limit” catches generally occurred in proportions of 10–20% for Barramundi, Bight Redfish, Chinaman Rockcod, King Threadfin, Northern Pearl Perch, Redthroat Emperor, West Australian Dhufish and Western Rock Lobster.

“Catch Release” fishing includes sport fishing, where fish are not tagged before release. This reason for release occurred in proportions of 30% or more for Barramundi, Giant Trevally, Golden Trevally, Gummy Sharks, Moses' Snapper, Mulloway, Queenfish, Snook, Southern Bluefin Tuna, Western Australian Salmon, Yellowfin Tuna and Yellowtail Kingfish. “Catch Release” catches occurred in proportions of 20–30% for Black Bream, Bluebarred Parrotfish, King Threadfin, Mackerel Tuna, Shark Mackerel, Tailor and Western Shovelnose Ray.

“Other” reasons for release included greater than legal limit, too big, too few (not enough for a meal/dinner/all of us), tag & release, conservation (other than legally protected species), sick (fish has signs of disease), damaged, deformed (not sick or damaged), dangerous, female (berried, eggs, setose, tar spot), poor eating quality (don't taste good, not nice to eat, slimy, hard to clean, many

bones, too much effort to cook, perceived or known), species unknown (not sure about species, eating quality or taste), poisonous (flesh or spines), protected species (e.g. sawfish), mistake (caught but got away, nothing to store fish in) or depredated (taken or damaged by another animal either below or at the surface). Collectively, these “Other” reasons for release occurred in proportions of 60% or more for Bronze Whaler, Giant Sea Catfish, Gurnard, Sea Trumpeter, Weeping Toadfish, Western King Wrasse and Western Shovelnose Ray.



**Table 4.** Estimated annual catch (total, kept and released numbers) and proportion released during 2017/18 by RBFL holders aged five years or older (se is standard error; values in bold indicate relative standard error >40% (i.e. se >40% of estimate); values in italics indicate <30 respondents recorded catches of the species).

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Abalone	Roe's Abalone	<i>Haliotis roei</i>	8,696	2,378	<b>269</b>	<b>185</b>	8,965	2,458	3%
Abalone	Greenlip Abalone	<i>Haliotis laevis</i>	<b>1,656</b>	<b>826</b>	<b>68</b>	<b>42</b>	<b>1,724</b>	<b>839</b>	4%
Abalone	Brownlip Abalone	<i>Haliotis conicopora</i>	<b>784</b>	<b>335</b>	<b>56</b>	<b>53</b>	<b>840</b>	<b>360</b>	7%
Cephalopod	Cuttlefish	<i>Sepia spp</i>	3,058	440	1,176	232	4,234	521	28%
Cephalopod	Octopus	<i>Octopus spp</i>	1,752	423	324	101	2,076	452	16%
Cephalopod	Squid	Order Teuthoidea - undifferentiated	85,565	8,037	2,954	680	88,519	8,336	3%
Lobster	Western Rock Lobster	<i>Panulirus cygnus</i>	455,025	38,377	240,408	31,975	695,433	64,273	35%
Lobster	Southern Rock Lobster	<i>Jasus edwardsii</i>	<b>5,140</b>	<b>2,337</b>	<b>3,904</b>	<b>2,085</b>	<b>9,044</b>	<b>4,358</b>	43%
Lobster	Painted Rock Lobster	<i>Panulirus versicolor</i>	<b>1,216</b>	<b>609</b>	<b>125</b>	<b>84</b>	<b>1,341</b>	<b>618</b>	9%
Lobster	Ornate Rock Lobster	<i>Panulirus ornatus</i>	511	136	<b>85</b>	<b>55</b>	596	163	14%
Crab	Blue Swimmer Crab	<i>Portunus armatus</i>	278,299	24,380	388,227	37,297	666,526	59,098	58%
Crab	Green Mud Crab	<i>Scylla serrata</i>	1,330	369	<b>1,441</b>	<b>658</b>	2,771	821	52%
Crab	Brown Mud Crab	<i>Scylla olivacea</i>	2,093	458	1,504	415	3,597	744	42%
Sharks	Blacktip Reef Shark	<i>Carcharhinus melanopterus</i>	197	68	1,628	438	1,824	445	89%
Sharks	Bronze Whaler	<i>Carcharhinus brachyurus</i>	428	99	1,029	246	1,457	271	71%
Sharks	Dusky Whaler	<i>Carcharhinus obscurus</i>	<b>66</b>	<b>28</b>	1,786	450	1,852	451	96%
Sharks	Grey Nurse Shark	<i>Carcharias taurus</i>	0	0	<b>70</b>	<b>53</b>	<b>70</b>	<b>53</b>	100%
Sharks	Gummy Sharks	<i>Mustelus antarcticus</i> & <i>M. stevensi</i>	922	190	771	161	1,693	262	46%
Sharks	Hammerhead Shark	Family Sphyrnidae	<b>19</b>	<b>18</b>	75	30	94	35	80%
Sharks	Lemon Shark	<i>Negaprion acutidens</i>	0	0	<b>214</b>	<b>102</b>	<b>214</b>	<b>102</b>	100%
Sharks	Port Jackson Shark	<i>Heterodontus portusjacksoni</i>	<b>3</b>	<b>3</b>	1,214	278	1,217	278	100%
Sharks	Sandbar Shark	<i>Carcharhinus plumbeus</i>	<b>27</b>	<b>20</b>	<b>14</b>	<b>13</b>	<b>42</b>	<b>24</b>	34%
Sharks	Tiger Shark	<i>Galeocerdo cuvier</i>	<b>7</b>	<b>6</b>	<b>933</b>	<b>605</b>	<b>940</b>	<b>605</b>	99%
Sharks	Whiskery Shark	<i>Furgaleus macki</i>	203	71	104	41	307	89	34%
Sharks	Whitetip Reef Shark	<i>Triaenodon obesus</i>	<b>19</b>	<b>18</b>	<b>728</b>	<b>358</b>	<b>747</b>	<b>360</b>	98%
Sharks	Wobbegong	Family Orectolobidae	216	78	467	102	684	140	68%
Sharks	Other Whaler	Carcharhinidae - undifferentiated	<b>33</b>	<b>22</b>	<b>85</b>	<b>39</b>	118	45	72%
Sharks	Other Shark	Sharks - undifferentiated	183	60	2,353	432	2,536	439	93%
Rays	Sawfishes	Pristidae - undifferentiated	0	0	<b>57</b>	<b>34</b>	<b>57</b>	<b>34</b>	100%
Rays	Western Shovelnose Ray	<i>Aptychotrema vincentiana</i>	0	0	1,038	290	1,038	290	100%
Rays	Other Rays Skates	Rays - undifferentiated	<b>46</b>	<b>35</b>	2,590	413	2,636	414	98%

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Barracouta	Barracouta	<i>Thyrsites atun</i>	0	0	17	17	17	17	100%
Billfish	Black Marlin	<i>Makaira indica</i>	87	59	528	173	615	200	86%
Billfish	Blue Marlin	<i>Makaira nigricans</i>	50	25	809	334	860	336	94%
Billfish	Sailfish	<i>Istiophorus platypterus</i>	15	13	892	258	907	261	98%
Billfish	Striped Marlin	<i>Tetrapturus audax</i>	0	0	129	58	129	58	100%
Bonito	Bonito	<i>Sarda spp</i>	225	78	131	104	355	130	37%
Bonito	Oriental Bonito	<i>Sarda orientalis</i>	5	4	23	22	28	23	83%
Bream	Black Bream	<i>Acanthopagrus butcheri</i>	6,406	1,445	25,193	5,118	31,599	6,168	80%
Bream	Frypan Bream	<i>Argyrops spinifer</i>	83	34	79	67	162	87	49%
Bream	Northwest Black Bream	<i>Acanthopagrus palmaris</i>	69	38	73	52	141	65	51%
Bream	Pink Snapper	<i>Chrysophrys auratus</i>	30,889	2,461	85,201	12,768	116,091	14,265	73%
Bream	Tarwhine	<i>Rhabdosargus sarba</i>	1,300	477	3,893	1,131	5,193	1,272	75%
Bream	Western Yellowfin Bream	<i>Acanthopagrus morrisoni</i>	2,126	1,506	1,720	1,118	3,846	1,914	45%
Bream	Other Bream	Sparidae - undifferentiated	70	40	45	30	114	50	39%
Catfish	Eeltail Catfishes	Plotosidae - undifferentiated	254	190	699	276	953	439	73%
Catfish	Estuary Cobbler	<i>Cnidoglanis macrocephalus</i>	148	79	85	59	233	128	36%
Catfish	Giant Sea Catfish	<i>Arius thalassinus</i>	15	9	2,596	487	2,610	488	99%
Catfish	Silver Cobbler	<i>Neoarius midgleyi</i>	0	0	90	62	90	62	100%
Catfish	Other Catfish	Ariidae - undifferentiated	19	13	1,074	280	1,093	281	98%
Cobia	Cobia	<i>Rachycentron canadum</i>	1,206	193	589	179	1,795	306	33%
Cod	Barramundi Cod	<i>Cromileptes altivelis</i>	134	51	81	45	216	73	38%
Cod	Blackspotted Rockcod	<i>Epinephelus malabaricus</i>	1,860	556	6,442	1,678	8,302	2,029	78%
Cod	Blacktip Rockcod	<i>Epinephelus fasciatus</i>	19	18	64	34	82	38	77%
Cod	Breaksea Cod	<i>Epinephelides armatus</i>	15,892	1,256	9,579	949	25,471	1,945	38%
Cod	Chinaman Rockcod	<i>Epinephelus rivulatus</i>	9,962	2,767	11,102	1,848	21,063	3,753	53%
Cod	Eightbar Grouper	<i>Hyporthodus octofasciatus</i>	406	177	179	138	585	302	31%
Cod	Frostback Rockcod	<i>Epinephelus bilobatus</i>	30	21	545	283	576	284	95%
Cod	Goldspotted Rockcod	<i>Epinephelus coioides</i>	2,597	418	4,745	767	7,342	990	65%
Cod	Harlequin Fish	<i>Othos dentex</i>	2,953	370	694	272	3,647	550	19%
Cod	Potato Rockcod	<i>Epinephelus tukula</i>	19	18	21	18	39	25	52%
Cod	Queensland Grouper	<i>Epinephelus lanceolatus</i>	0	0	19	13	19	13	100%
Cod	Rankin Cod	<i>Epinephelus multinotatus</i>	6,477	1,023	3,163	690	9,640	1,393	33%
Cod	Temperate Basses & Rockcods	Epinephelidae - undifferentiated	424	110	2,520	919	2,944	926	86%
Cod	Tomato Rockcod	<i>Cephalopholis sonnerati</i>	52	50	55	36	107	85	51%
Cod	Yellowspotted Rockcod	<i>Epinephelus areolatus</i>	409	172	1,592	387	2,001	429	80%

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Coral Trout	Coral Trout	<i>Plectropomus maculatus</i> & <i>P leopardus</i>	8,096	897	5,745	1,022	13,841	1,695	42%
Coral Trout	Yellowedge Coronation Trout	<i>Variola louti</i>	208	64	<b>62</b>	<b>32</b>	270	74	23%
Emperor	Bluespotted Emperor	<i>Lethrinus punctulatus</i>	<b>445</b>	<b>179</b>	2,059	660	2,504	751	82%
Emperor	Grass Emperor	<i>Lethrinus laticaudis</i>	13,726	2,284	23,270	4,546	36,996	6,219	63%
Emperor	Longnose Emperor	<i>Lethrinus olivaceus</i>	<b>323</b>	<b>145</b>	<b>154</b>	<b>120</b>	<b>476</b>	<b>258</b>	32%
Emperor	Redspot Emperor	<i>Lethrinus lentjan</i>	<b>10</b>	<b>7</b>	<b>113</b>	<b>97</b>	<b>123</b>	<b>97</b>	92%
Emperor	Redthroat Emperor	<i>Lethrinus miniatus</i>	7,899	1,318	13,490	2,347	21,389	3,228	63%
Emperor	Robinsons' Seabream	<i>Gymnocranius grandoculis</i>	971	310	<b>222</b>	<b>109</b>	1,194	332	19%
Emperor	Spangled Emperor	<i>Lethrinus nebulosus</i>	8,290	1,061	12,211	1,643	20,501	2,420	60%
Emperor	Yellowtail Emperor	<i>Lethrinus atkinsoni</i>	<b>75</b>	<b>71</b>	<b>604</b>	<b>502</b>	<b>679</b>	<b>507</b>	89%
Emperor	Other Emperor	Lethrinidae - undifferentiated	492	154	<b>646</b>	<b>267</b>	1,138	383	57%
Flathead	Northern Sand Flathead	<i>Platycephalus endrachtensis</i>	<b>273</b>	<b>112</b>	<b>530</b>	<b>459</b>	<b>803</b>	<b>559</b>	66%
Flathead	Southern Bluespotted Flathead	<i>Platycephalus speculator</i>	3,691	792	13,325	2,394	17,016	2,729	78%
Flathead	Yellowtail Flathead	<i>Platycephalus westraliae</i>	902	199	8,868	1,880	9,770	1,951	91%
Flounder	Smalltooth Flounder	<i>Pseudorhombus jenynsii</i>	174	56	<b>68</b>	<b>41</b>	242	74	28%
Flounder	Other Flatfish	<i>Bothidae</i> & <i>Pleuronectidae</i> spp	<b>50</b>	<b>39</b>	<b>12</b>	<b>12</b>	<b>62</b>	<b>40</b>	20%
Garfish	Southern Garfish	<i>Hyporhamphus melanochir</i>	796	311	<b>1,926</b>	<b>927</b>	2,723	980	71%
Garfish	Three-by-two Garfish	<i>Hemiramphus robustus</i>	<b>1,343</b>	<b>710</b>	<b>257</b>	<b>184</b>	<b>1,600</b>	<b>745</b>	16%
Garfish	Other Garfish	Hemiramphidae - undifferentiated	<b>279</b>	<b>269</b>	<b>401</b>	<b>370</b>	<b>681</b>	<b>458</b>	59%
Giant Perch	Barramundi	<i>Lates calcarifer</i>	1,587	486	4,214	924	5,801	1,203	73%
Giant Perch	Sand Bass	<i>Psammoperca waigiensis</i>	<b>85</b>	<b>46</b>	<b>127</b>	<b>77</b>	<b>213</b>	<b>90</b>	60%
Goatfish	Bluespotted Goatfish	<i>Upeneichthys vlamingii</i>	626	187	1,361	339	1,987	391	68%
Grunter	Sea Trumpeter	<i>Pelsartia humeralis</i>	<b>360</b>	<b>182</b>	6,168	1,445	6,528	1,459	94%
Grunter	Western Sooty Grunter	<i>Hephaestus jenkinsi</i>	<b>157</b>	<b>136</b>	<b>213</b>	<b>101</b>	<b>370</b>	<b>169</b>	58%
Grunter	Western Striped Grunter	<i>Pelates octolineatus</i>	<b>195</b>	<b>162</b>	3,605	904	3,800	934	95%
Grunter	Other Trumpeter	<i>Latridopsis</i> spp	<b>262</b>	<b>252</b>	<b>736</b>	<b>384</b>	<b>998</b>	<b>459</b>	74%
Grunter Bream	Painted Sweetlips	<i>Diagramma labiosum</i>	1,092	245	1,199	430	2,291	521	52%
Grunter Bream	Barred Javelin	<i>Pomadasys kaakan</i>	<b>217</b>	<b>93</b>	<b>512</b>	<b>278</b>	<b>729</b>	<b>363</b>	70%
Grunter Bream	Blotched Javelin	<i>Pomadasys maculatus</i>	<b>15</b>	<b>9</b>	<b>22</b>	<b>14</b>	<b>36</b>	<b>17</b>	60%
Grunter Bream	Grunter Bream	Haemulidae - undifferentiated	<b>7</b>	<b>6</b>	<b>344</b>	<b>228</b>	<b>352</b>	<b>232</b>	98%
Gurnard	Bighead Gurnard Perch	<i>Neosebastes pandus</i>	<b>178</b>	<b>87</b>	2,600	729	2,778	735	94%
Gurnard	Gurnard	Neosebastidae - undifferentiated	<b>239</b>	<b>118</b>	2,242	376	2,481	395	90%
Jewfish	Black Jewfish	<i>Protonibea diacanthus</i>	234	85	265	89	500	143	53%
Jewfish	Mulloway	<i>Argyrosomus japonicus</i>	394	92	<b>901</b>	<b>379</b>	1,296	401	70%
King Snapper	Goldband Snapper	<i>Pristipomoides multidens</i>	3,876	1,124	1,567	469	5,443	1,467	29%

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
King Snapper	Rosy Snapper	<i>Pristipomoides filamentosus</i>	685	265	210	112	896	301	23%
King Snapper	Sharptooth Snapper	<i>Pristipomoides typus</i>	74	46	90	63	164	78	55%
Leatherjacket	Horseshoe Leatherjacket	<i>Meuschenia hippocrepis</i>	233	79	1,382	653	1,615	658	86%
Leatherjacket	Sixspine Leatherjacket	<i>Meuschenia freycineti</i>	223	139	150	81	374	161	40%
Leatherjacket	Leatherjacket	Monacanthidae - undifferentiated	677	209	3,229	725	3,906	783	83%
Lizardfish	Lizardfish Grinners	Bathysauridae, Synodontidae - undifferentiated	84	48	589	188	673	204	88%
Longtom	Longtom	Belonidae - undifferentiated	33	16	451	200	484	201	93%
Mackerel	Blue Mackerel	<i>Scomber australasicus</i>	957	373	160	93	1,117	384	14%
Mackerel	Grey Mackerel	<i>Scomberomorus semifasciatus</i>	530	178	358	202	888	331	40%
Mackerel	School Mackerel	<i>Scomberomorus queenslandicus</i>	682	223	517	146	1,199	336	43%
Mackerel	Shark Mackerel	<i>Grammatorcynus bicarinatus</i>	421	140	551	140	972	198	57%
Mackerel	Spanish Mackerel	<i>Scomberomorus commerson</i>	5,221	590	4,345	874	9,566	1,260	45%
Mackerel	Spotted Mackerel	<i>Scomberomorus munroi</i>	273	84	652	279	926	307	70%
Mackerel	Wahoo	<i>Acanthocybium solandri</i>	204	60	232	171	436	195	53%
Mackerel	Other Mackerel & Tuna	Scombridae - undifferentiated	793	620	229	89	1,022	628	22%
Mahi Mahi	Mahi Mahi	<i>Coryphaena spp</i>	437	132	800	448	1,236	482	65%
Morwong	Blue Morwong	<i>Nemadactylus valenciennesi</i>	4,336	573	875	198	5,210	661	17%
Morwong	Dusky Morwong	<i>Dactylophora nigricans</i>	0	0	19	18	19	18	100%
Morwong	Other Morwong	Cheilodactylidae - undifferentiated	12	12	0	0	12	12	0%
Mullet	Bluetail Mullet	<i>Valamugil buchanani</i>	156	134	0	0	156	134	0%
Mullet	Diamondscale Mullet	<i>Liza vaigiensis</i>	338	205	0	0	338	205	0%
Mullet	Greenback Mullet	<i>Liza subviridis</i>	160	140	37	24	197	162	19%
Mullet	Sea Mullet	<i>Mugil cephalus</i>	8,025	4,998	1,207	1,018	9,232	5,226	13%
Mullet	Yelloweye Mullet	<i>Aldrichetta forsteri</i>	3,878	2,434	37	26	3,916	2,434	1%
Mullet	Other Mullet	Mugilidae - undifferentiated	1,094	783	207	132	1,301	803	16%
Pearl Perch	Northern Pearl Perch	<i>Glaucosoma buergeri</i>	480	104	235	95	715	155	33%
Pearl Perch	West Australian Dhufish	<i>Glaucosoma hebraicum</i>	27,924	1,952	39,918	4,552	67,842	6,028	59%
Pike	Great Barracuda	<i>Sphyraena barracuda</i>	23	18	564	209	587	211	96%
Pike	Snook	<i>Sphyraena novaehollandiae</i>	1,181	404	1,210	561	2,391	795	51%
Pike	Yellowtail Barracuda	<i>Sphyraena obtusata</i>	264	139	528	192	792	242	67%
Pike	Other Pike	Sphyraenidae - undifferentiated	250	167	169	106	419	197	40%
Queenfish	Queenfish	<i>Scomberoides spp</i>	199	57	1,399	385	1,598	399	88%
Redfish	Bight Redfish	<i>Centroberyx gerrardi</i>	12,209	1,698	4,725	1,136	16,933	2,561	28%
Redfish	Swallowtail	<i>Centroberyx lineatus</i>	2,550	443	1,920	382	4,470	720	43%

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Redfish	Yelloweye Redfish	<i>Centroberyx australis</i>	<b>17</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>17</b>	0%
Salmon Herring	Australian Herring	<i>Arripis georgianus</i>	94,991	10,330	24,554	2,833	119,545	11,793	21%
Salmon Herring	Western Australian Salmon	<i>Arripis truttaceus</i>	1,717	344	3,306	1,087	5,023	1,260	66%
Sergeant Baker	Sergeant Baker	<i>Aulopus purpurissatus</i>	2,057	430	5,404	659	7,461	858	72%
Small Baitfish	Small Baitfish	Clupeidae, Engralidae & Atherinidae - undifferentiated	<b>179</b>	<b>161</b>	<b>0</b>	<b>0</b>	<b>179</b>	<b>161</b>	0%
Small Baitfish	Other Herring	Clupeidae - undifferentiated	<b>181</b>	<b>160</b>	<b>699</b>	<b>603</b>	<b>880</b>	<b>624</b>	79%
Sweep	Banded Sweep	<i>Scorpius georgiana</i>	604	225	1,003	288	1,607	371	62%
Sweep	Sea Sweep	<i>Scorpius aequipinnis</i>	2,491	439	2,224	374	4,715	644	47%
Sweep	Silver Drummer	<i>Kyphosus spp complex</i>	<b>31</b>	<b>20</b>	<b>82</b>	<b>56</b>	<b>113</b>	<b>59</b>	72%
Tailor	Tailor	<i>Pomatomus saltatrix</i>	5,427	1,370	8,612	2,865	14,039	3,678	61%
Threadfin	Blue Threadfin	<i>Eleutheronema tetradactylum</i>	1,428	319	1,306	407	2,734	577	48%
Threadfin	King Threadfin	<i>Polydactylus macrochir</i>	634	126	575	179	1,208	250	48%
Threadfin Bream	Rosy Threadfin Bream	<i>Nemipterus furcosus</i>	<b>101</b>	<b>53</b>	<b>89</b>	<b>53</b>	<b>190</b>	<b>75</b>	47%
Threadfin Bream	Western Butterfish	<i>Pentapodus vitta</i>	3,887	1,207	14,910	3,161	18,797	3,540	79%
Trevalla	Blue-Eye Trevalla	<i>Hyperoglyphe antarctica</i>	<b>80</b>	<b>44</b>	<b>300</b>	<b>293</b>	<b>381</b>	<b>296</b>	79%
Trevally	Amberjack	<i>Seriola dumerili</i>	<b>93</b>	<b>42</b>	<b>183</b>	<b>100</b>	<b>276</b>	<b>108</b>	66%
Trevally	Bludger Trevally	<i>Carangoides gymnostethus</i>	186	65	778	299	964	310	81%
Trevally	Common Dart	<i>Trachinotus botla</i>	<b>17</b>	<b>17</b>	<b>838</b>	<b>774</b>	<b>855</b>	<b>774</b>	98%
Trevally	Giant Trevally	<i>Caranx ignobilis</i>	461	172	3,128	1,042	3,589	1,066	87%
Trevally	Golden Trevally	<i>Gnathanodon speciosus</i>	2,085	564	5,035	1,680	7,119	1,831	71%
Trevally	Rainbow Runner	<i>Elagatis bipinnulata</i>	<b>29</b>	<b>24</b>	<b>0</b>	<b>0</b>	<b>29</b>	<b>24</b>	0%
Trevally	Samsonfish	<i>Seriola hippos</i>	1,718	235	6,367	1,032	8,086	1,106	79%
Trevally	Silver Trevally	<i>Pseudocaranx georgianus spp complex</i>	25,556	3,231	20,358	3,862	45,913	6,592	44%
Trevally	Turrun	<i>Carangoides fulvoguttatus</i>	<b>53</b>	<b>36</b>	<b>337</b>	<b>143</b>	<b>389</b>	<b>163</b>	86%
Trevally	Yellowtail Kingfish	<i>Seriola lalandi</i>	1,102	256	<b>1,357</b>	<b>639</b>	2,459	704	55%
Trevally	Yellowtail Scad	<i>Trachurus novaezelandiae</i>	<b>1,531</b>	<b>740</b>	<b>1,047</b>	<b>567</b>	2,578	940	41%
Trevally	Other Trevally	Carangidae - undifferentiated	675	206	<b>859</b>	<b>400</b>	1,535	474	56%
Tripletail	Tripletail	<i>Lobotes surinamensis</i>	<b>79</b>	<b>33</b>	<b>101</b>	<b>56</b>	<b>179</b>	<b>85</b>	56%
Tropical Snapper	Brownstripe Snapper	<i>Lutjanus vitta</i>	<b>5</b>	<b>4</b>	<b>14</b>	<b>13</b>	<b>19</b>	<b>14</b>	75%
Tropical Snapper	Chinamanfish	<i>Symphorus nematophorus</i>	179	54	<b>278</b>	<b>115</b>	457	142	61%
Tropical Snapper	Crimson Snapper	<i>Lutjanus erythropterus</i>	1,301	327	2,180	752	3,481	987	63%
Tropical Snapper	Darktail Snapper	<i>Lutjanus lemniscatus</i>	<b>308</b>	<b>293</b>	<b>0</b>	<b>0</b>	<b>308</b>	<b>293</b>	0%
Tropical Snapper	Flame Snapper	<i>Etelis coruscens</i>	<b>3</b>	<b>2</b>	<b>200</b>	<b>133</b>	<b>203</b>	<b>133</b>	98%
Tropical Snapper	Golden Snapper	<i>Lutjanus johnii</i>	1,181	313	1,789	636	2,969	825	60%

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Tropical Snapper	Mangrove Jack	<i>Lutjanus argentimaculatus</i>	1,941	407	2,163	673	4,104	924	53%
Tropical Snapper	Maori Snapper	<i>Lutjanus rivulatus</i>	<b>36</b>	<b>15</b>	<b>15</b>	<b>13</b>	<b>51</b>	<b>20</b>	29%
Tropical Snapper	Moses' Snapper	<i>Lutjanus russellii</i>	753	223	<b>569</b>	<b>249</b>	1,322	345	43%
Tropical Snapper	Red Emperor	<i>Lutjanus sebae</i>	7,909	1,060	8,439	1,273	16,348	2,004	52%
Tropical Snapper	Ruby Snapper	<i>Etelis carbunculus</i>	<b>420</b>	<b>212</b>	<b>66</b>	<b>39</b>	<b>486</b>	<b>217</b>	14%
Tropical Snapper	Saddletail Snapper	<i>Lutjanus malabaricus</i>	<b>3,564</b>	<b>1,638</b>	2,578	874	6,142	2,105	42%
Tropical Snapper	Stripey Snapper	<i>Lutjanus carponotatus</i>	5,132	836	11,300	1,960	16,433	2,542	69%
Tropical Snapper	Other Snapper	Lutjanidae - undifferentiated	281	93	<b>420</b>	<b>171</b>	<b>700</b>	<b>198</b>	60%
Tuna	Dogtooth Tuna	<i>Gymnosarda unicolor</i>	<b>13</b>	<b>13</b>	<b>182</b>	<b>169</b>	<b>194</b>	<b>169</b>	93%
Tuna	Longtail Tuna	<i>Thunnus orientalis</i>	<b>147</b>	<b>75</b>	<b>273</b>	<b>154</b>	<b>420</b>	<b>171</b>	65%
Tuna	Mackerel Tuna	<i>Euthynnus affinis</i>	576	140	1,030	251	1,606	306	64%
Tuna	Skipjack Tuna	<i>Katsuwonus pelamis</i>	<b>460</b>	<b>194</b>	<b>244</b>	<b>166</b>	<b>705</b>	<b>266</b>	35%
Tuna	Southern Bluefin Tuna	<i>Thunnus maccoyii</i>	1,823	542	872	264	2,694	691	32%
Tuna	Yellowfin Tuna	<i>Thunnus albacares</i>	606	129	517	191	1,123	273	46%
Tuskfish Wrasse	Baldchin Groper	<i>Choerodon rubescens</i>	16,607	1,554	9,062	1,132	25,669	2,374	35%
Tuskfish Wrasse	Blackspot Tuskfish	<i>Choerodon schoenleinii</i>	3,174	601	2,069	556	5,242	1,006	39%
Tuskfish Wrasse	Blue Tuskfish	<i>Choerodon cyanodus</i>	1,966	458	1,262	351	3,228	681	39%
Tuskfish Wrasse	Bluebarred Parrotfish	<i>Scarus ghobban spp complex</i>	<b>1,444</b>	<b>938</b>	1,355	484	2,799	1,057	48%
Tuskfish Wrasse	Bluespotted Tuskfish	<i>Choerodon cauteroma</i>	<b>259</b>	<b>131</b>	<b>256</b>	<b>135</b>	<b>515</b>	<b>191</b>	50%
Tuskfish Wrasse	Brownspeckled Wrasse	<i>Notolabrus parilus</i>	3,799	1,111	22,285	3,164	26,084	3,912	85%
Tuskfish Wrasse	Foxfish	<i>Bodianus frenchii</i>	1,471	252	1,122	258	2,593	399	43%
Tuskfish Wrasse	Goldspot Pigfish	<i>Bodianus perditio</i>	168	51	<b>82</b>	<b>40</b>	<b>249</b>	<b>71</b>	33%
Tuskfish Wrasse	Purple Tuskfish	<i>Choerodon cephalotes</i>	196	64	<b>116</b>	<b>52</b>	<b>312</b>	<b>92</b>	37%
Tuskfish Wrasse	Southern Maori Wrasse	<i>Ophthalmolepis lineolatus</i>	820	317	3,604	1,050	4,424	1,138	81%
Tuskfish Wrasse	Western Blue Groper	<i>Achoerodus gouldii</i>	704	201	<b>209</b>	<b>137</b>	<b>913</b>	<b>322</b>	23%
Tuskfish Wrasse	Western King Wrasse	<i>Coris auricularis</i>	5,345	1,045	30,068	3,465	35,413	3,910	85%
Tuskfish Wrasse	Other Parrotfish	Scaridae - undifferentiated	<b>343</b>	<b>185</b>	<b>2,130</b>	<b>650</b>	<b>2,473</b>	<b>694</b>	86%
Tuskfish Wrasse	Other Tuskfish	<i>Choerodon spp</i>	<b>37</b>	<b>36</b>	<b>107</b>	<b>60</b>	<b>144</b>	<b>69</b>	74%
Tuskfish Wrasse	Other Wrasse	Labridae - undifferentiated	<b>40</b>	<b>28</b>	3,290	1,280	3,330	1,281	99%
Western Blue Devil	Western Blue Devil	<i>Paraplesiops sinclairi</i>	<b>35</b>	<b>14</b>	572	130	<b>607</b>	<b>132</b>	94%
Whiting	Goldenline Whiting	<i>Sillago analis</i>	<b>35</b>	<b>34</b>	<b>7</b>	<b>6</b>	<b>42</b>	<b>34</b>	17%
Whiting	King George Whiting	<i>Sillaginodes punctata</i>	42,239	7,230	10,410	1,801	52,649	8,310	20%
Whiting	School Whiting	<i>Sillago schomburgkii, bassensis &amp; vittata</i>	196,341	25,886	63,019	17,728	259,359	37,475	24%
Whiting	Western Trumpeter Whiting	<i>Sillago burrus</i>	<b>1,539</b>	<b>856</b>	2,944	1,053	<b>4,483</b>	<b>1,445</b>	66%
Whiting	Other Whiting	Sillaginidae - undifferentiated	<b>1,362</b>	<b>820</b>	<b>628</b>	<b>318</b>	<b>1,990</b>	<b>1,116</b>	32%

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Wreckfish	Bass Groper	<i>Polyprion americanus</i>	<b>128</b>	<b>71</b>	<b>19</b>	<b>18</b>	<b>147</b>	<b>74</b>	13%
Wreckfish	Hapuku	<i>Polyprion oxygeneios</i>	587	195	<b>26</b>	<b>20</b>	614	198	4%
Finfish Other	Butterfish	Stromateidae - undifferentiated	0	0	<b>34</b>	<b>23</b>	<b>34</b>	<b>23</b>	100%
Finfish Other	Dory	Zeidae - undifferentiated	<b>58</b>	<b>29</b>	0	0	<b>58</b>	<b>29</b>	0%
Finfish Other	Conger Eel	<i>Conger spp</i>	0	0	<b>33</b>	<b>19</b>	<b>33</b>	<b>19</b>	100%
Finfish Other	Other Eel	Order Anguilliformes - undifferentiated	<b>56</b>	<b>33</b>	298	82	354	88	84%
Finfish Other	Moonfish Batfish	Lampridae - undifferentiated	0	0	<b>212</b>	<b>117</b>	<b>212</b>	<b>117</b>	100%
Finfish Other	Oxeye Herring	<i>Megalops cyprinoides</i>	<b>7</b>	<b>6</b>	<b>65</b>	<b>57</b>	<b>73</b>	<b>64</b>	90%
Finfish Other	Silver Toadfish	<i>Lagocephalus sceleratus</i>	<b>51</b>	<b>34</b>	2,096	637	2,147	641	98%
Finfish Other	Weeping Toadfish	<i>Torquigener pleurogramma</i>	<b>314</b>	<b>303</b>	5,635	1,284	5,950	1,319	95%
Finfish Other	Other Toadfish	Tetraodontidae - undifferentiated	<b>36</b>	<b>20</b>	4,332	1,344	4,368	1,344	99%
Finfish Other	Other Boxfish	Ostraciidae - undifferentiated	<b>7</b>	<b>7</b>	0	0	<b>7</b>	<b>7</b>	0%
Finfish Other	Other Boarfish	Pentacerotidae - undifferentiated	<b>155</b>	<b>82</b>	0	0	<b>155</b>	<b>82</b>	0%

**Table 5.** Summary of release rates for selected species during 2017/18 by RBFL holders aged five years or older.

0 to 24%	25 to 39%	40 to 59%	60 to 74%	75 to 89%	90 to 100%
Squid	Barcheek Coral Trout	Brown Mud Crab	Golden Snapper	Blackspotted Rockcod	Gurnard
Octopus	Cuttlefish	Saddletail Snapper	Tailor	Sth'n Bluespotted Flathead	Yellowtail Flathead
Blue Morwong	Bight Redfish	Swallowtail	Banded Sweep	Samsonfish	Bighead Gurnard Perch
Yellowfin Whiting	Goldband Snapper	Moses' Snapper	Crimson Snapper	Western Butterfish	Western Blue Devil
Robinsons' Seabream	Southern Bluefin Tuna	School Mackerel	Grass Emperor	Yellowspotted Rockcod	Sea Trumpeter
Harlequin Fish	Rankin Cod	Foxfish	Redthroat Emperor	Black Bream	Weeping Toadfish
King George Whiting	Cobia	Gummy Shark	Mackerel Tuna	Southern Maori Wrasse	Western Striped Grunter
Australian Herring	Northern Pearl Perch	Silver Trevally	Goldspotted Rockcod	Leatherjacket	Dusky Whaler
Western Blue Groper	Western School Whiting	Spanish Mackerel	Western Australian Salmon	Western King Wrasse	Giant Sea Catfish
School Whiting	Western Rock Lobster	Yellowfin Tuna	Wobbegong	Brownsponsored Wrasse	Port Jackson Shark
	Baldchin Groper	Common Coral Trout	Bluespotted Goatfish	Giant Trevally	Western Shovelnose Ray
	Breaksea Cod	Sea Sweep	Stripey Snapper	Queenfish	Billfish
	Blue Tuskfish	King Threadfin	Mulloway	Blacktip Reef Shark	
	Blackspot Tuskfish	Blue Threadfin	Bronze Whaler		
		Bluebarred Parrotfish	Golden Trevally		
		Snook	Sergeant Baker		
		Red Emperor	Barramundi		
		Painted Sweetlips	Pink Snapper		
		Mangrove Jack	Tarwhine		
		Chinaman Rockcod			
		Yellowtail Kingfish			
		Shark Mackerel			
		Blue Swimmer Crab			
		West Australian Dhufish			
		Spangled Emperor			



**Table 6.** Proportion released by specified reasons during 2017/18 by RBFL holders aged five years or older (values in bold indicate relative standard error >40% (i.e. se >40% of estimate); only species where >30 respondents recorded catches of the species are reported).

Reporting Group	Common Name	Scientific Name	Too Small	Under Size	Too Many	Over Limit	Catch Release	Other
Cephalopod	Cuttlefish	<i>Sepia spp</i>	2%	8%	54%	0%	12%	25%
Cephalopod	Octopus	<i>Octopus spp</i>	22%	0%	58%	0%	0%	21%
Cephalopod	Squid	<i>Order Teuthoidea - undifferentiated</i>	26%	30%	19%	7%	4%	14%
Lobster	Western Rock Lobster	<i>Panulirus cygnus</i>	6%	56%	6%	15%	0%	17%
Crab	Blue Swimmer Crab	<i>Portunus armatus</i>	3%	79%	0%	2%	0%	16%
Crab	Brown Mud Crab	<i>Scylla olivacea</i>	6%	53%	0%	0%	0%	41%
Sharks	Blacktip Reef Shark	<i>Carcharhinus melanopterus</i>	0%	1%	28%	0%	19%	52%
Sharks	Bronze Whaler	<i>Carcharhinus brachyurus</i>	1%	8%	24%	3%	2%	62%
Sharks	Dusky Whaler	<i>Carcharhinus obscurus</i>	0%	8%	67%	0%	3%	22%
Sharks	Gummy Sharks	<i>Mustelus antarcticus &amp; M stevensi</i>	3%	2%	45%	0%	31%	20%
Sharks	Port Jackson Shark	<i>Heterodontus portusjacksoni</i>	6%	0%	46%	0%	11%	38%
Sharks	Wobbegong	<i>Family Orectolobidae</i>	8%	4%	36%	0%	17%	35%
Sharks	Other Shark	<i>Sharks - undifferentiated</i>	0%	0%	60%	0%	12%	27%
Rays	Western Shovelnose Ray	<i>Aptychotrema vincentiana</i>	0%	0%	20%	0%	20%	60%
Rays	Other Rays Skates	<i>Rays - undifferentiated</i>	0%	0%	38%	0%	9%	52%
Bream	Black Bream	<i>Acanthopagrus butcheri</i>	24%	35%	14%	5%	21%	1%
Bream	Pink Snapper	<i>Chrysophrys auratus</i>	6%	84%	4%	2%	3%	2%
Bream	Tarwhine	<i>Rhabdosargus sarba</i>	12%	47%	17%	0%	2%	22%
Catfish	Giant Sea Catfish	<i>Arius thalassinus</i>	2%	0%	19%	0%	16%	63%
Cobia	Cobia	<i>Rachycentron canadum</i>	12%	31%	19%	0%	9%	29%
Cod	Blackspotted Rockcod	<i>Epinephelus malabaricus</i>	7%	50%	15%	0%	11%	18%
Cod	Breaksea Cod	<i>Epinephelides armatus</i>	12%	65%	8%	9%	1%	5%
Cod	Chinaman Rockcod	<i>Epinephelus rivulatus</i>	22%	24%	20%	14%	7%	12%
Cod	Goldspotted Rockcod	<i>Epinephelus coioides</i>	18%	31%	21%	0%	7%	23%
Cod	Harlequin Fish	<i>Othos dentex</i>	12%	28%	17%	20%	9%	14%
Cod	Rankin Cod	<i>Epinephelus multinotatus</i>	21%	37%	25%	2%	7%	7%
Cod	Temperate Basses & Rockcods	<i>Epinephelidae - undifferentiated</i>	7%	49%	13%	0%	2%	30%
Cod	Yellowspotted Rockcod	<i>Epinephelus areolatus</i>	9%	33%	52%	0%	1%	5%
Coral Trout	Coral Trout	<i>Plectropomus maculatus &amp; P leopardus</i>	9%	60%	12%	2%	4%	13%
Emperor	Grass Emperor	<i>Lethrinus laticaudis</i>	16%	65%	8%	1%	6%	4%
Emperor	Redthroat Emperor	<i>Lethrinus miniatus</i>	19%	37%	12%	11%	4%	17%
Emperor	Robinsons' Seabream	<i>Gymnocranius grandoculis</i>	0%	<b>47%</b>	<b>17%</b>	<b>8%</b>	<b>16%</b>	<b>12%</b>

Reporting Group	Common Name	Scientific Name	Too Small	Under Size	Too Many	Over Limit	Catch Release	Other
Emperor	Spangled Emperor	<i>Lethrinus nebulosus</i>	7%	67%	9%	0%	5%	11%
Flathead	Southern Bluespotted Flathead	<i>Platycephalus speculator</i>	28%	62%	6%	0%	3%	1%
Flathead	Yellowtail Flathead	<i>Platycephalus westraliae</i>	16%	67%	5%	0%	2%	10%
Giant Perch	Barramundi	<i>Lates calcarifer</i>	5%	25%	12%	10%	36%	12%
Goatfish	Bluespotted Goatfish	<i>Upeneichthys vlamingii</i>	16%	14%	30%	0%	0%	40%
Grunter	Sea Trumpeter	<i>Pelsartia humeralis</i>	1%	10%	18%	0%	0%	70%
Grunter	Western Striped Grunter	<i>Pelates octolineatus</i>	9%	5%	21%	0%	8%	57%
Grunter Bream	Painted Sweetlips	<i>Diagramma labiosum</i>	4%	35%	17%	1%	0%	44%
Gurnard	Bighead Gurnard Perch	<i>Neosebastes pandus</i>	13%	1%	25%	0%	4%	57%
Gurnard	Gurnard	<i>Neosebastidae - undifferentiated</i>	14%	6%	16%	0%	4%	60%
Jewfish	Mulloway	<i>Argyrosomus japonicus</i>	<b>3%</b>	<b>22%</b>	<b>31%</b>	0%	<b>43%</b>	<b>1%</b>
King Snapper	Goldband Snapper	<i>Pristipomoides multidens</i>	0%	63%	8%	1%	0%	28%
Leatherjacket	Leatherjacket	<i>Monacanthidae - undifferentiated</i>	14%	19%	24%	0%	2%	41%
Mackerel	School Mackerel	<i>Scomberomorus queenslandicus</i>	10%	43%	27%	3%	8%	10%
Mackerel	Shark Mackerel	<i>Grammatorcynus bicarinatus</i>	1%	25%	33%	0%	23%	17%
Mackerel	Spanish Mackerel	<i>Scomberomorus commerson</i>	8%	46%	11%	1%	13%	21%
Morwong	Blue Morwong	<i>Nemadactylus valenciennesi</i>	6%	34%	27%	9%	4%	20%
Pearl Perch	Northern Pearl Perch	<i>Glaucosoma buergeri</i>	<b>9%</b>	<b>46%</b>	<b>8%</b>	<b>13%</b>	0%	<b>24%</b>
Pearl Perch	West Australian Dhufish	<i>Glaucosoma hebraicum</i>	9%	69%	4%	14%	1%	3%
Pike	Snook	<i>Sphyraena novaehollandiae</i>	<b>24%</b>	<b>8%</b>	<b>12%</b>	0%	<b>47%</b>	<b>10%</b>
Queenfish	Queenfish	<i>Scomberoides spp</i>	4%	12%	23%	0%	49%	12%
Redfish	Bight Redfish	<i>Centroberyx gerrardi</i>	38%	36%	11%	10%	3%	2%
Redfish	Swallowtail	<i>Centroberyx lineatus</i>	18%	33%	37%	2%	4%	6%
Salmon Herring	Australian Herring	<i>Arripis georgianus</i>	38%	22%	13%	6%	16%	5%
Salmon Herring	Western Australian Salmon	<i>Arripis truttaceus</i>	5%	5%	28%	1%	53%	8%
Sergeant Baker	Sergeant Baker	<i>Aulopus purpurissatus</i>	5%	12%	24%	0%	4%	55%
Sweep	Banded Sweep	<i>Scorpis georgiana</i>	16%	5%	23%	0%	9%	47%
Sweep	Sea Sweep	<i>Scorpis aequipinnis</i>	14%	11%	52%	0%	2%	21%
Tailor	Tailor	<i>Pomatomus saltatrix</i>	13%	41%	16%	0%	29%	0%
Threadfin	Blue Threadfin	<i>Eleutheronema tetradactylum</i>	8%	41%	43%	0%	6%	2%
Threadfin	King Threadfin	<i>Polydactylus macrochir</i>	3%	43%	17%	15%	20%	3%
Threadfin Bream	Western Butterfish	<i>Pentapodus vitta</i>	15%	8%	22%	0%	4%	51%
Trevally	Giant Trevally	<i>Caranx ignobilis</i>	3%	13%	20%	0%	49%	15%
Trevally	Golden Trevally	<i>Gnathanodon speciosus</i>	7%	8%	17%	0%	50%	18%

Reporting Group	Common Name	Scientific Name	Too Small	Under Size	Too Many	Over Limit	Catch Release	Other
Trevally	Samsonfish	<i>Seriola hippos</i>	4%	12%	37%	1%	16%	30%
Trevally	Silver Trevally	<i>Pseudocaranx georgianus spp complex</i>	25%	42%	27%	0%	2%	4%
Trevally	Yellowtail Kingfish	<i>Seriola lalandi</i>	<b>2%</b>	<b>12%</b>	<b>12%</b>	0%	<b>47%</b>	<b>27%</b>
Trevally	Other Trevally	<i>Carangidae - undifferentiated</i>	<b>7%</b>	<b>5%</b>	<b>23%</b>	0%	<b>49%</b>	<b>17%</b>
Tropical Snapper	Crimson Snapper	<i>Lutjanus erythropterus</i>	18%	41%	11%	23%	1%	6%
Tropical Snapper	Golden Snapper	<i>Lutjanus johnii</i>	40%	49%	6%	0%	5%	0%
Tropical Snapper	Mangrove Jack	<i>Lutjanus argentimaculatus</i>	25%	27%	19%	0%	10%	19%
Tropical Snapper	Moses' Snapper	<i>Lutjanus russellii</i>	<b>3%</b>	<b>42%</b>	<b>1%</b>	0%	<b>35%</b>	<b>18%</b>
Tropical Snapper	Red Emperor	<i>Lutjanus sebae</i>	11%	50%	12%	4%	4%	19%
Tropical Snapper	Saddletail Snapper	<i>Lutjanus malabaricus</i>	43%	29%	10%	7%	7%	5%
Tropical Snapper	Stripey Snapper	<i>Lutjanus carponotatus</i>	10%	65%	17%	0%	4%	3%
Tuna	Mackerel Tuna	<i>Euthynnus affinis</i>	1%	18%	26%	0%	27%	28%
Tuna	Southern Bluefin Tuna	<i>Thunnus maccoyii</i>	4%	17%	9%	4%	30%	36%
Tuna	Yellowfin Tuna	<i>Thunnus albacares</i>	17%	8%	7%	0%	54%	14%
Tuskfish Wrasse	Baldchin Groper	<i>Choerodon rubescens</i>	10%	75%	4%	7%	2%	1%
Tuskfish Wrasse	Blackspot Tuskfish	<i>Choerodon schoenleinii</i>	5%	65%	16%	0%	8%	6%
Tuskfish Wrasse	Blue Tuskfish	<i>Choerodon cyanodus</i>	6%	83%	6%	0%	3%	2%
Tuskfish Wrasse	Bluebarred Parrotfish	<i>Scarus ghobban spp complex</i>	20%	7%	32%	0%	26%	15%
Tuskfish Wrasse	Brownspeckled Wrasse	<i>Notolabrus parilus</i>	4%	9%	32%	0%	3%	52%
Tuskfish Wrasse	Foxfish	<i>Bodianus frenchii</i>	18%	28%	34%	0%	5%	16%
Tuskfish Wrasse	Southern Maori Wrasse	<i>Ophthalmolepis lineolatus</i>	16%	11%	38%	0%	0%	35%
Tuskfish Wrasse	Western Blue Groper	<i>Achoerodus gouldii</i>	<b>40%</b>	<b>41%</b>	<b>5%</b>	0%	<b>14%</b>	0%
Tuskfish Wrasse	Western King Wrasse	<i>Coris auricularis</i>	5%	5%	22%	0%	3%	65%
Tuskfish Wrasse	Other Wrasse	<i>Labridae - undifferentiated</i>	1%	1%	64%	1%	1%	33%
Western Blue Devil	Western Blue Devil	<i>Paraplesiops sinclairi</i>	5%	7%	46%	0%	1%	41%
Whiting	King George Whiting	<i>Sillaginodes punctata</i>	22%	75%	1%	1%	0%	0%
Whiting	School Whiting	<i>Sillago schomburgkii, bassensis &amp; vittata</i>	45%	33%	11%	2%	8%	1%
Finfish Other	Weeping Toadfish	<i>Torquigener pleurogramma</i>	0%	0%	0%	0%	0%	100%
Finfish Other	Other Toadfish	<i>Tetraodontidae - undifferentiated</i>	0%	0%	5%	0%	0%	95%

## 6 Estimates of Catch for Key Species

This section presents estimates of boat-based recreational catch (kept, released and total, by number) for the 12-months from September 2017 to August 2018. Estimates are summarised by habitat, fishing method and month for key species.

Summaries are provided by bioregion, habitat, fishing method and season for priority species identified on the basis of reported catches and importance for management. Key Species have been allocated to habitat types according to the Resource Assessment Framework (RAF) (Department of Fisheries 2011). However, the following RAF indicator species were caught in low numbers and are not included in this section: Blue-eye Trevalla (*Hyperoglyphe antarctica*); Brownstripe Snapper (*Lutjanus vitta*); Perth Herring (*Nematalosa vlaminghi*); Pilchard (*Sardinops sagax*); Sandbar Shark (*Carcharhinus plumbeus*); Western Blue Groper (*Achoerodus gouldii*); Whiskery Shark (*Furgaleus macki*); Whitebait (*Hyperlophus vittatus*); and Silver Cobbler (*Neoarius midgleyi*).

Estimates of recreational catch for key species are presented by habitat type. This includes:

- 5 species/taxa for estuarine; Barramundi (*Lates calcarifer*), Black Bream (*Acanthopagrus butcheri*), Estuary Cobbler (*Cnidoglanis macrocephalus*), Southern Bluespotted Flathead (*Platycephalus speculator*) and Yellowtail Flathead (*Platycephalus westraliae*).
- 23 species/taxa for nearshore; Australian Herring (*Arripis georgianus*), Western Australian Salmon (*Arripis truttaceus*), Western Yellowfin Bream (*Acanthopagrus morrisoni*), Chinaman Rockcod (*Epinephelus rivulatus*), Grunters (*Pelsartia humeralis* & *Pelates octolineatus*), Garfish (*Hyporhamphus melanochir* and *Hemiramphus robustus*), Leatherjacket (Family Monacanthidae), Mullet (Family Mugilidae), Tailor (*Pomatomus saltatrix*), Western Butterfish (*Pentapodus vitta*), Blue Threadfin (*Eleutheronema tetradactylum*), King Threadfin (*Polydactylus macrochir*), Giant Trevally (*Caranx ignobilis*), Golden Trevally (*Gnathanodon speciosus*), Silver Trevally (*Pseudocaranx* spp. complex), Yellowtail Scad (*Trachurus novaezelandiae*), Mangrove Jack (*Lutjanus argentimaculatus*), Blue Mackerel (*Scomber australasicus*), Brownspotted Wrasse (*Notolabrus parilus*), Southern Maori Wrasse (*Ophthalmolepis lineolatus*), Western King Wrasse (*Coris auricularis*), King George Whiting (*Sillaginodes punctata*), School Whiting (*Sillago bassensis*, *vittata* and *schomburgkii*).
- 26 species/taxa for inshore demersal; Pink Snapper (*Chrysophrys auratus*), Bluespotted Emperor (*Lethrinus punctulatus*), Grass Emperor (*Lethrinus laticaudis*), Redthroat Emperor (*Lethrinus miniatus*), Spangled Emperor (*Lethrinus nebulosus*), Blackspotted Rockcod (*Epinephelus malabaricus*), Breaksea Cod (*Epinephelides armatus*), Coral Trout (*Plectropomus maculatus* and *P. leopardus*), Goldspotted Rockcod (*Epinephelus coioides*), Harlequin Fish (*Othos dentex*), Rankin Cod (*Epinephelus multinotatus*), Painted Sweetlips (*Diagramma labiosum*), Sergeant Baker (*Aulopus purpurissatus*), Blue Morwong (*Nemadactylus valenciennesi*), West Australian Dhufish (*Glaucosoma hebraicum*), Bight Redfish (*Centroberyx gerrardi*), Swallowtail (*Centroberyx lineatus*), Sea Sweep (*Scorpius aequipinnis*), Crimson Snapper (*Lutjanus erythropterus*), Goldband Snapper (*Pristipomoides*

*multidens*), Red Emperor (*Lutjanus sebae*), Stripey Snapper (*Lutjanus carponotatus*), Baldchin Groper (*Choerodon rubescens*), Blackspot Tuskfish (*Choerodon schoenleinii*), Blue Tuskfish (*Choerodon cyanodus*) and Foxfish (*Bodianus frenchii*).

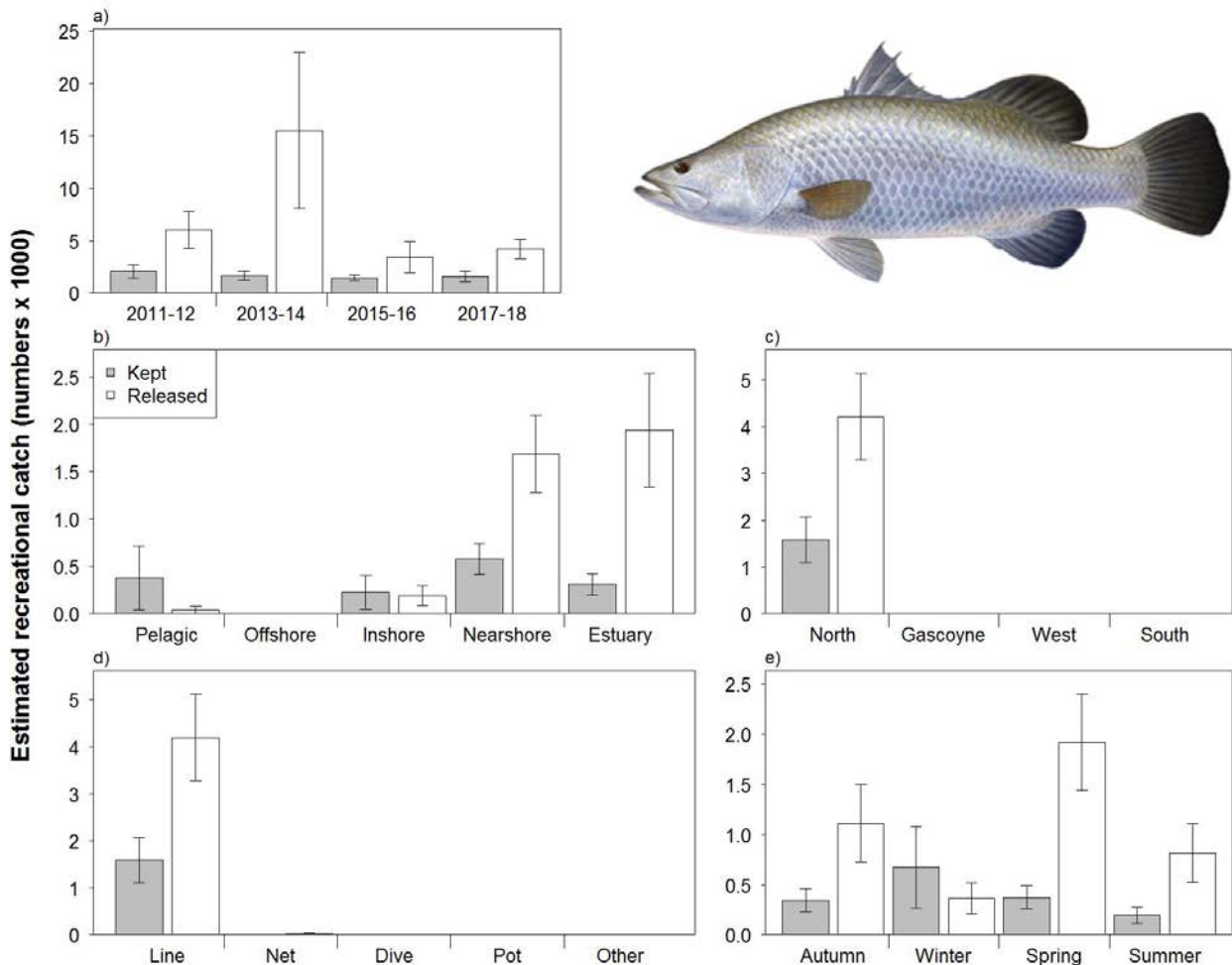
- 3 species/taxa for offshore demersal; Eightbar Grouper (*Hyporthodus octofasciatus*), Ruby Snapper (*Etelis carbunculus*) and Hapuku (*Polyprion oxygeneios*).
- 11 species/taxa for pelagic; Billfish (Family Istiophoridae), Cobia (*Rachycentron canadum*), Samsonfish (*Seriola hippos*), Yellowtail Kingfish (*Seriola lalandi*), Grey Mackerel (*Scomberomorus semifasciatus*), School Mackerel (*Scomberomorus queenslandicus*), Shark Mackerel (*Grammatorcynus bicarinatus*), Spanish Mackerel (*Scomberomorus commerson*), Mackerel Tuna (*Euthynnus affinis*), Southern Bluefin Tuna (*Thunnus maccoyii*) and Yellowfin Tuna (*Thunnus albacares*).
- 4 species/taxa for sharks; Gummy Sharks (*Mustelus antarcticus* and *M. stevensi*), Port Jackson Shark (*Heterodontus portusjacksoni*), Whaler Sharks (Family Carcharhinidae) and Wobbegong (Family Orectolobidae).
- 3 species/taxa for crustaceans; Western Rock Lobster (*Panulirus cygnus*), Mud Crab (*Scylla olivacea* and *S. serrata*) and Blue Swimmer Crab (*Portunus armatus*).
- 1 species/taxa for molluscs; Abalone (*Haliotis* spp.).
- 3 species/taxa for cephalopods; Cuttlefish (Order Sepiidae), Squid (Order Teuthoidea) and Octopus (Order Octopodidae).

## 6.1 Estuarine

Estimates of catches for estuarine species will be underestimated because shore-based catches are not reported.

### 6.1.1 Barramundi (*Lates calcarifer*)

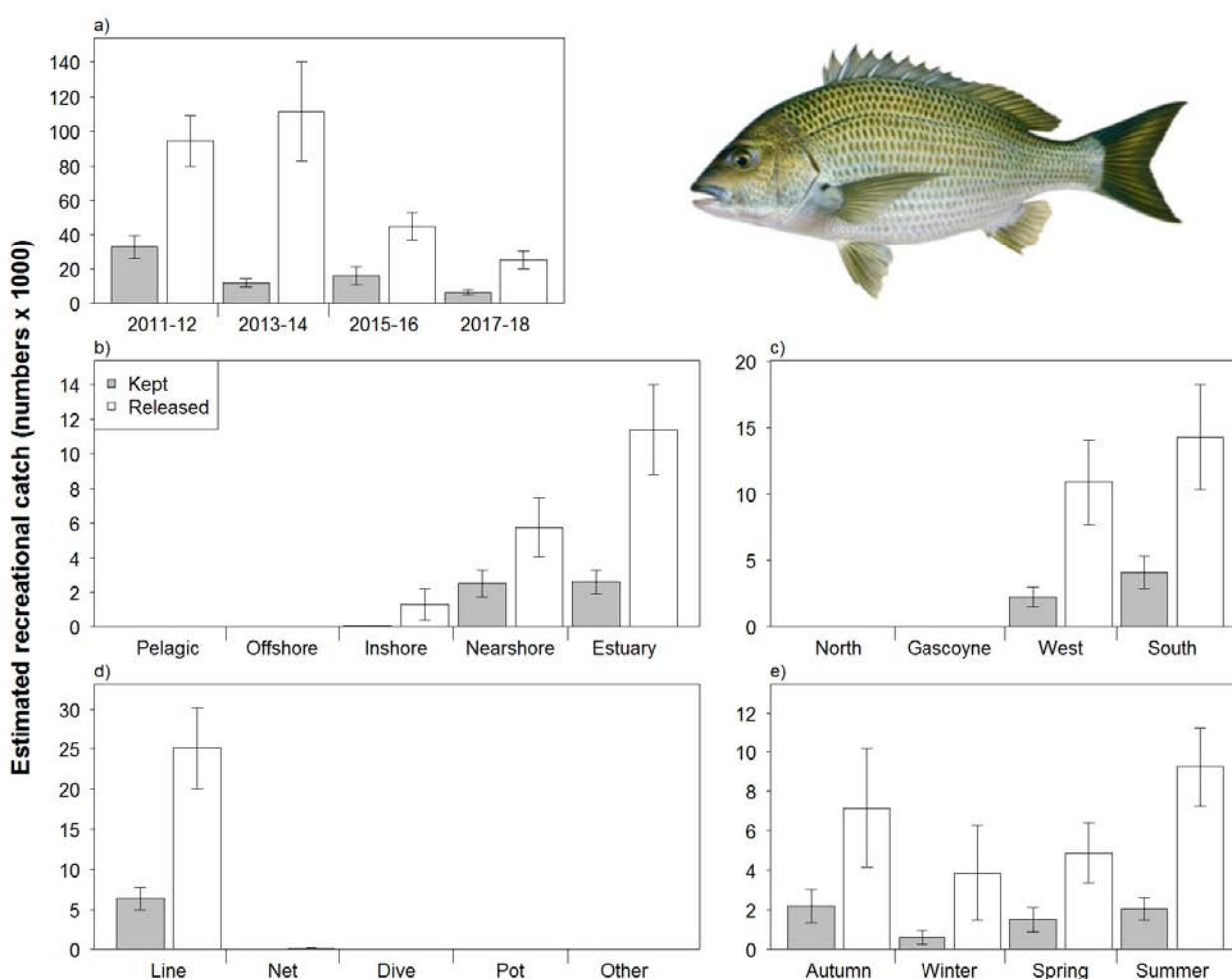
Barramundi is an indicator species in the North Coast bioregion. All boat-based recreational catches of Barramundi occurred in the North Coast (Figure 23c). The majority of catches were released (73%; Table 4, Figure 23a) and attributed to “Catch and Release” and “Under Size” (Table 6). Catches were taken predominantly from nearshore and estuary (Figure 23b) and freshwater (not shown). Most catches were taken by line fishing (Figure 23d). Barramundi were harvested throughout the year, with highest catches in spring, followed by autumn, winter and summer (Figure 23e). The estimated kept recreational catch of Barramundi in 2017/18 was similar with previous statewide surveys (Figure 23a) although the estimated released catch in 2017/18 was considerably lower than in 2013/14.



**Figure 23.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Barramundi in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.1.2 Black Bream (*Acanthopagrus butcheri*)

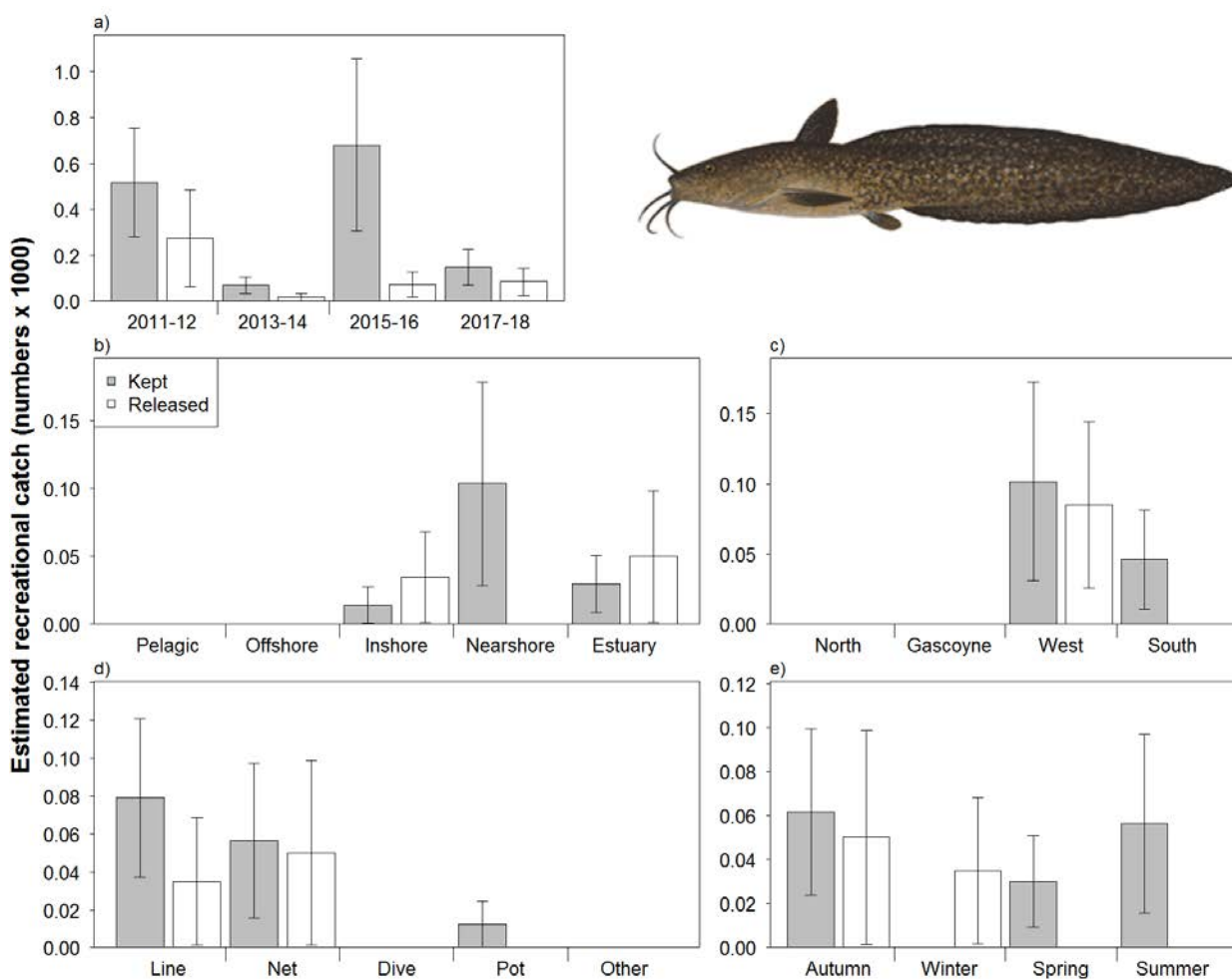
Black Bream is an indicator species in the West Coast and South Coast bioregions. Most boat-based recreational catches of Black Bream occurred in the South Coast, followed by the West Coast (Figure 24c). The majority of catches were released (80%; Table 4, Figure 24a) and attributed to “Under Size” and “Too Small” (Table 6). Catches were taken predominantly from estuary and nearshore (Figure 24b), and freshwater (not shown). Most catches were taken by line fishing (Figure 24d). Black Bream were harvested throughout the year, with higher catches in autumn and summer compared with spring and winter (Figure 24e). The estimated kept recreational catch of Black Bream in 2017/18 was higher compared with 2015/16, while the estimated released recreational catch was lower (Figure 24a).



**Figure 24.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Black Bream in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.1.3 Estuary Cobbler (*Cnidoglanis macrocephalus*)

Estuary Cobbler is an indicator species in the West Coast and South Coast bioregions. Most boat-based recreational catches of Estuary Cobbler occurred in the West Coast, with some catches in the South Coast (Figure 25c). The majority of catches were retained (36% released; Table 4, Figure 25a). Catches were taken predominantly from estuary and nearshore (Figure 25b) and by line fishing, with some fishing from nets and pots (Figure 25d). Estuary Cobbler were mainly harvested in summer and autumn (Figure 25e). The estimated kept recreational catch of Estuary Cobbler in 2017/18 was lower compared with 2015/16, however, the catch estimates for this species have high uncertainty (Figure 25a).

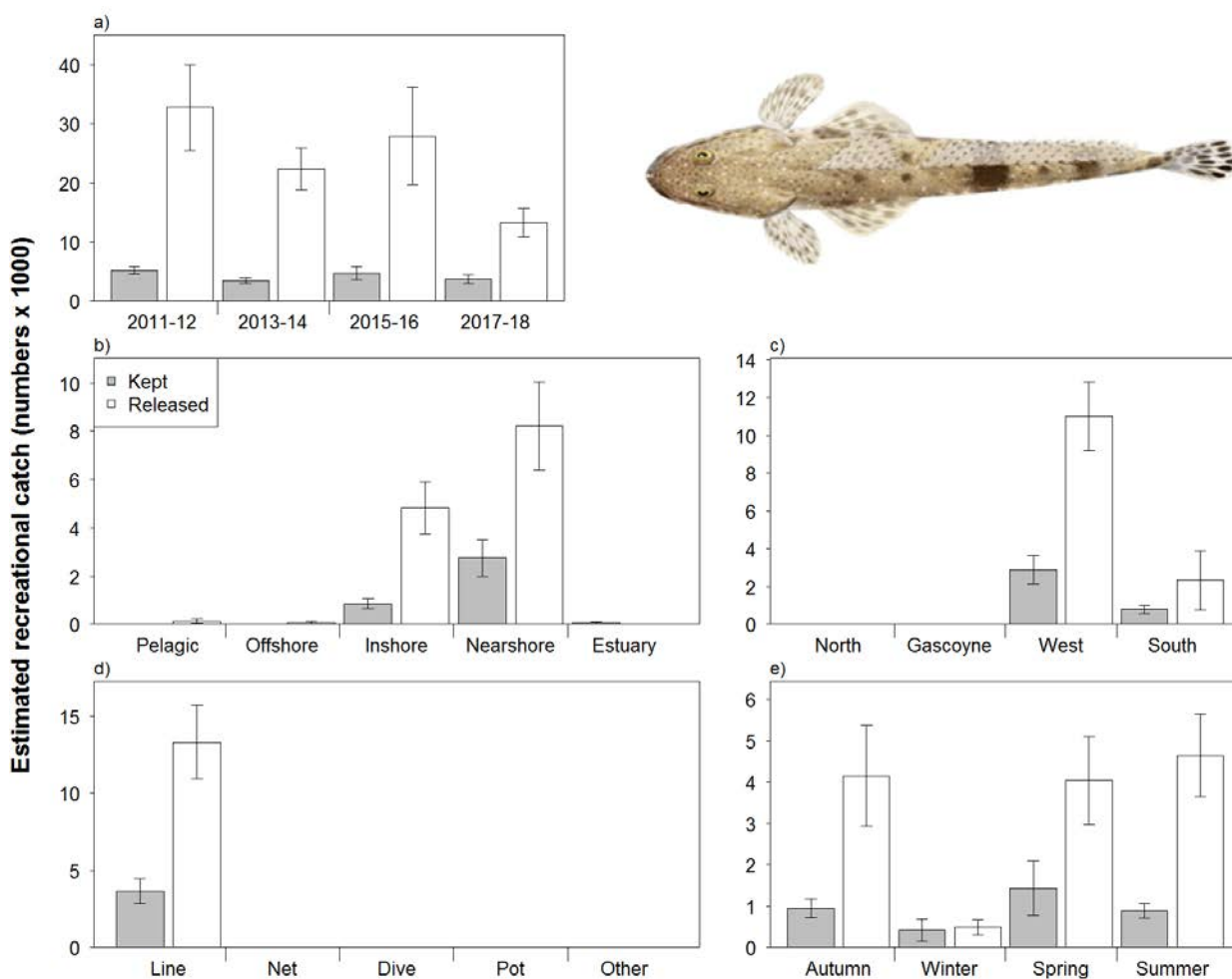


**Figure 25.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Estuary Cobbler in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.



### 6.1.4 Southern Bluespotted Flathead (*Platycephalus speculator*)

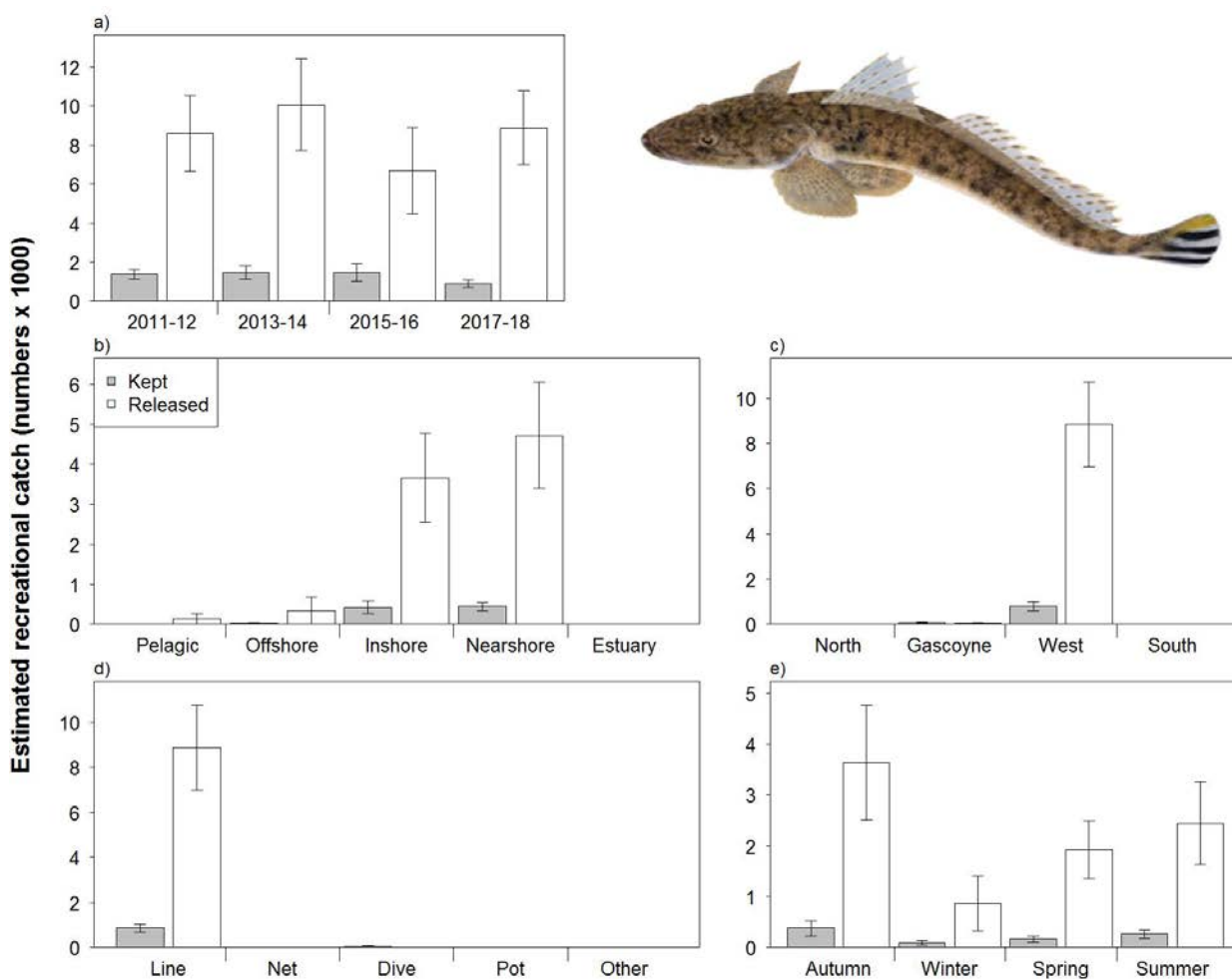
Most boat-based recreational catches of Southern Bluespotted Flathead occurred in the West Coast, followed by the South Coast (Figure 26c). The majority of catches were released (78%; Table 4, Figure 26a) and attributed to “Under Size” and “Too Small” (Table 6). Catches were taken predominantly from nearshore and inshore demersal (Figure 26b). All catches were taken by line fishing (Figure 26d). Southern Bluespotted Flathead were harvested throughout the year, with lower catches in winter (Figure 26e). The estimated kept recreational catch of Southern Bluespotted Flathead in 2017/18 was similar with previous statewide surveys, while the estimated released recreational catch was lower (Figure 26a).



**Figure 26.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Southern Bluespotted Flathead in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.1.5 Yellowtail Flathead (*Platycephalus westraliae*)

Most boat-based recreational catches of Yellowtail Flathead occurred in the West Coast, with some catches in the Gascoyne Coast (Figure 27c). The majority of catches were released (91%; Table 4, Figure 27a) and attributed to “Under Size” (Table 6). Catches were taken predominantly from nearshore and inshore demersal (Figure 27b). Most catches were taken by line fishing (Figure 27d). Yellowtail Flathead were harvested throughout the year, with higher catches in autumn, followed by summer, spring and winter (Figure 27e). The estimated kept and released recreational catches of Yellowtail Flathead in 2017/18 were similar with previous statewide surveys (Figure 27a).



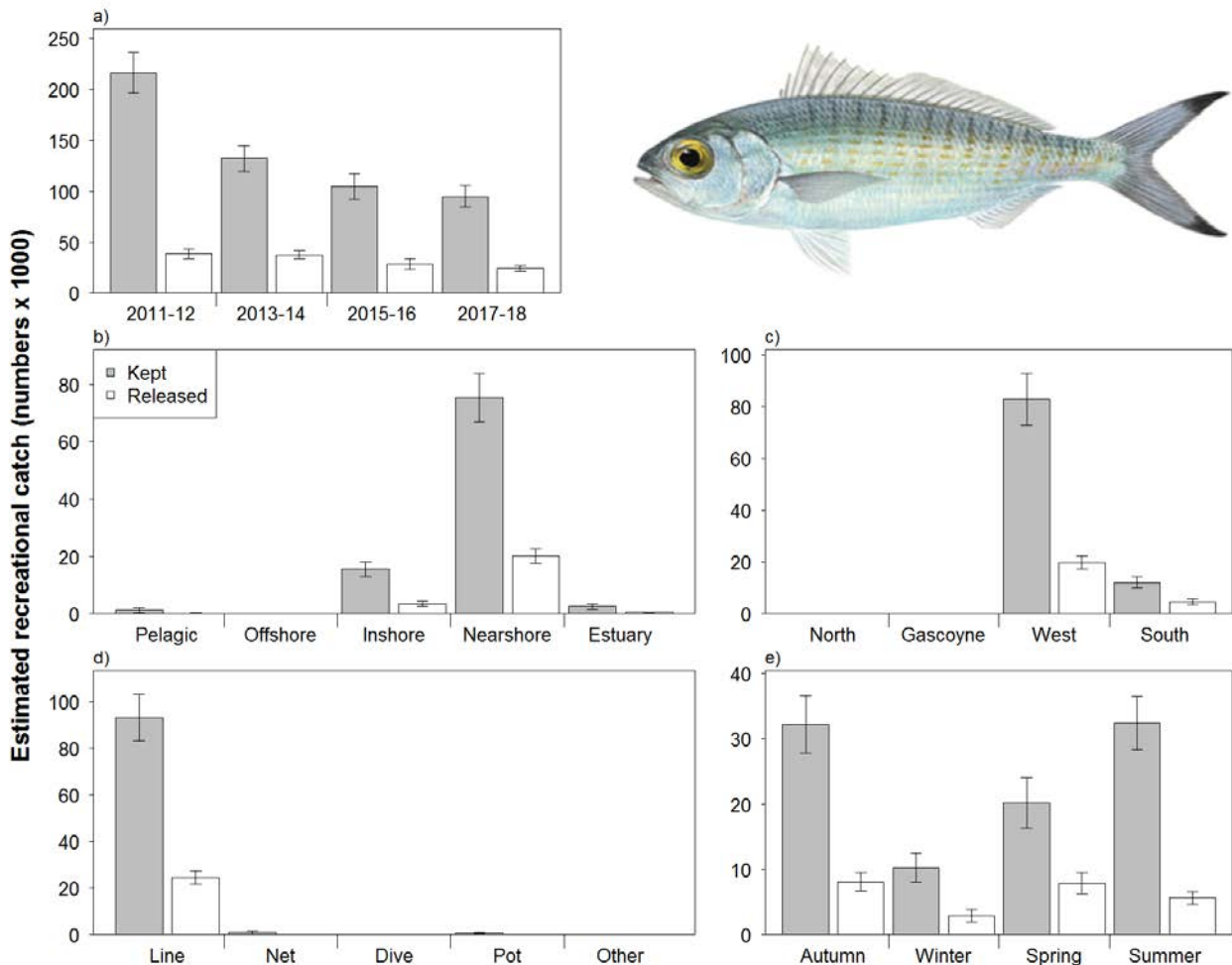
**Figure 27.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Yellowtail Flathead in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

## 6.2 Nearshore

Estimates of catch for nearshore species provided in this report will be underestimated, particularly those harvested by high proportions of shore-based recreational fishers.

### 6.2.1 Australian Herring (*Arripis georgianus*)

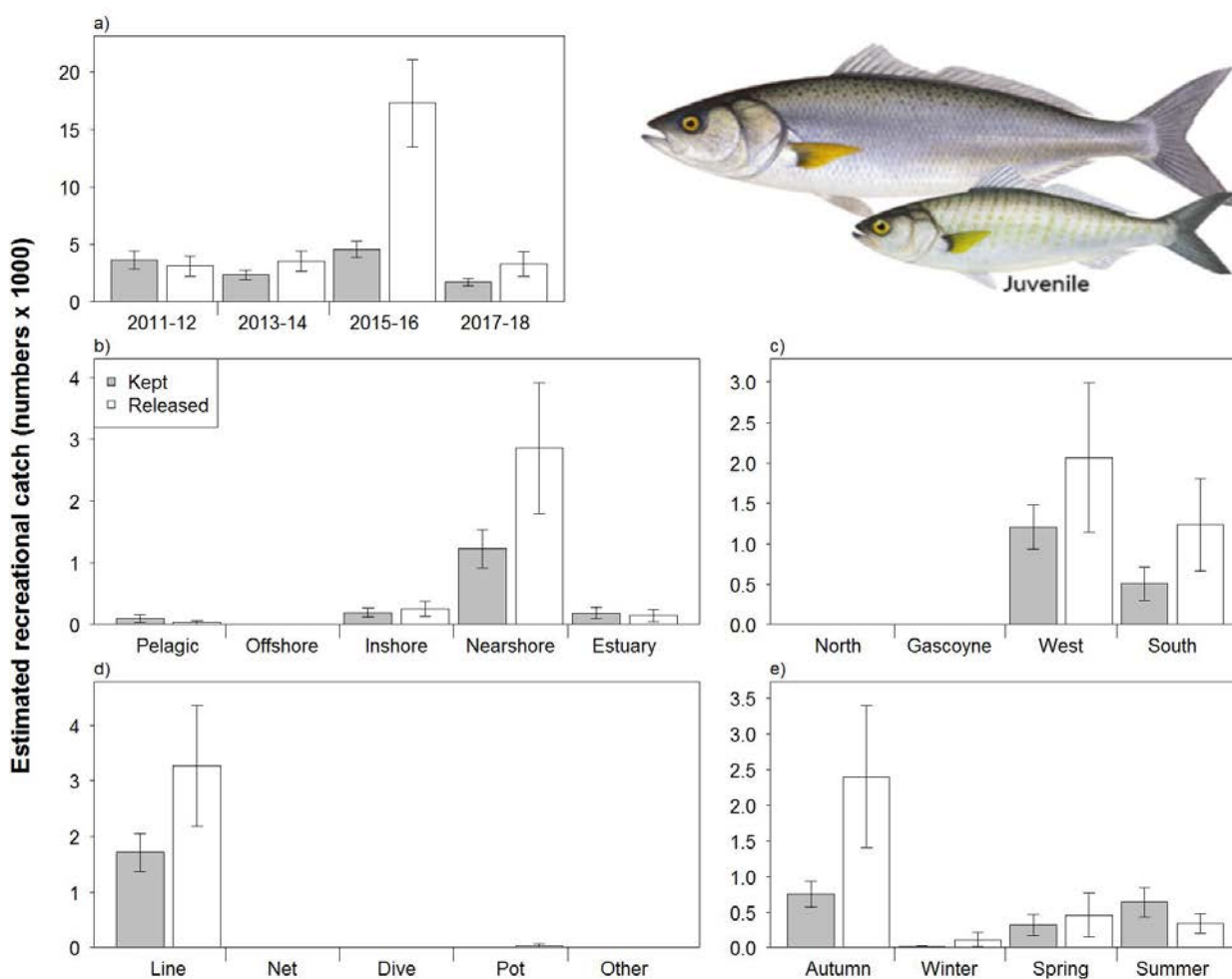
Australian Herring is an indicator species in the West Coast and South Coast bioregions. Most boat-based recreational catches of Australian Herring occurred in the West Coast, followed by the South Coast (Figure 28c). The majority of catches were retained (21% released; Table 4, Figure 28a) with most releases attributed to “Too Small” and “Under Size” (Table 6). Catches were predominantly taken from nearshore (Figure 28b) and by line fishing (Figure 28d). Australian Herring were harvested throughout the year, with higher catches in summer and autumn, followed by spring and winter (Figure 28e). The estimated kept recreational catch in 2017/18 was similar to 2015/16, but lower than 2011/12, while the released recreational catch in 2017/18 was similar with previous statewide surveys (Figure 28a).



**Figure 28.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Australian Herring in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

## 6.2.2 Western Australian Salmon (*Arripis truttaceus*)

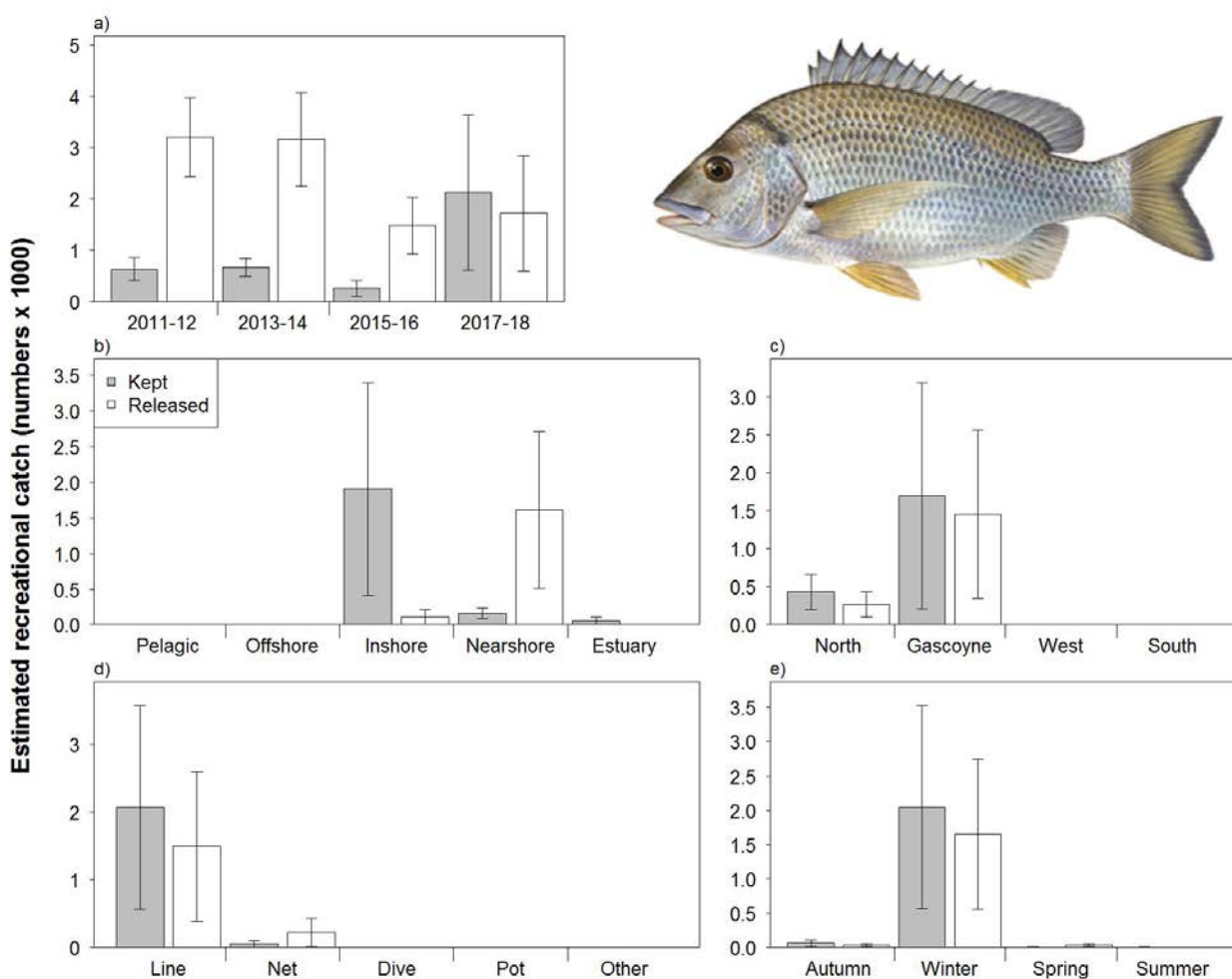
Western Australian Salmon is an indicator species in the South Coast bioregion. Most boat-based recreational catches of Western Australian Salmon occurred in the West Coast, followed by the South Coast (Figure 29c). The majority of catches were released (66%; Table 4, Figure 29a) and attributed to “Catch and Release” and “Too Many” (Table 6). Catches were taken predominantly from nearshore (Figure 29b) and by line fishing (Figure 29d). The majority of catches were in autumn (Figure 29e). The estimated kept and released recreational catches of Western Australian Salmon was lower in 2017/18 compared with 2015/16 (Figure 29a).



**Figure 29.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Western Australian Salmon in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.2.3 Western Yellowfin Bream (*Acanthopagrus morrisoni*)

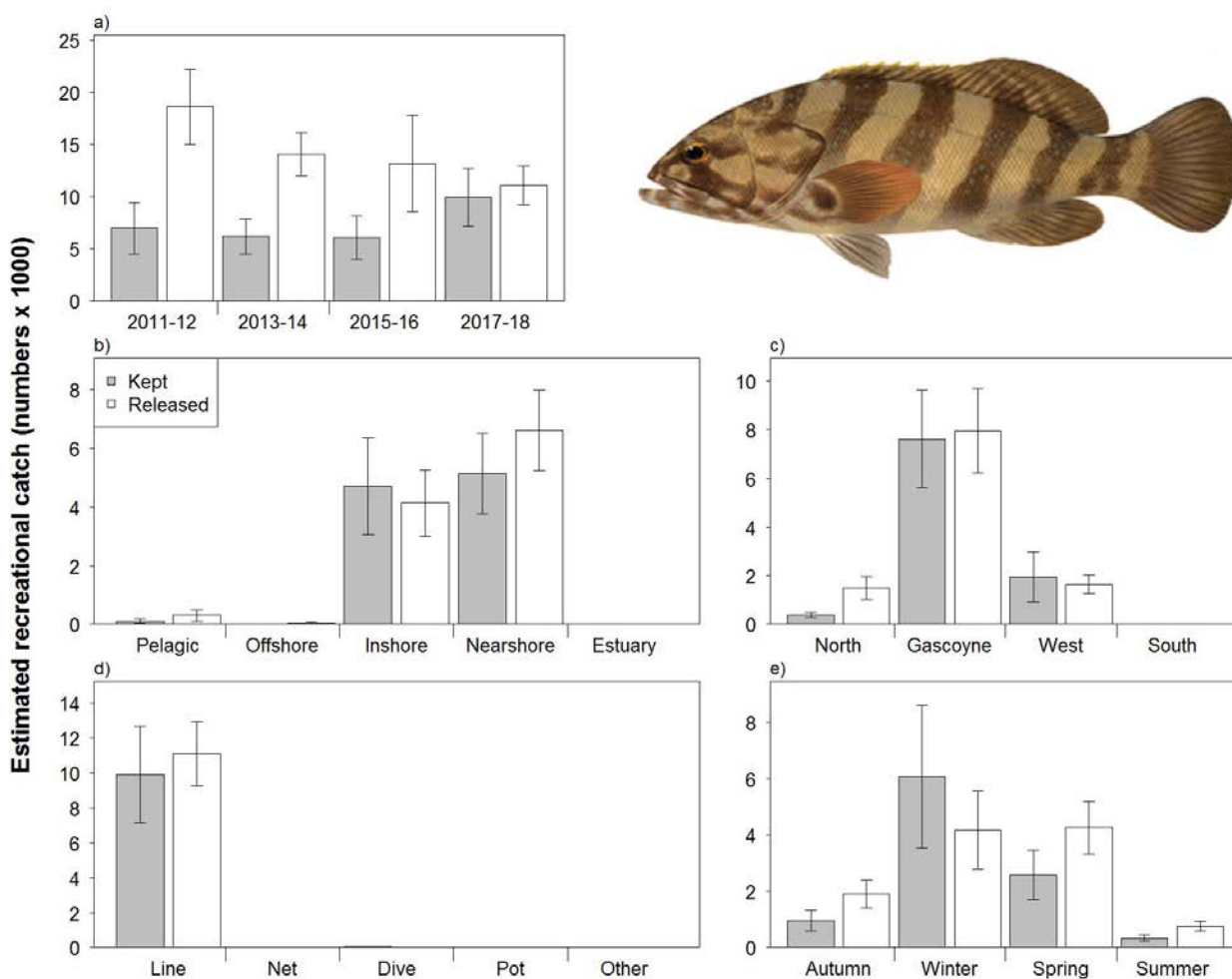
Most boat-based recreational catches of Western Yellowfin Bream occurred in the Gascoyne Coast, with some catches in the North Coast (Figure 30c). The majority of catches were retained (45% released; Table 5, Figure 30a). Catches were taken predominantly from nearshore and inshore demersal (Figure 30b). Most catches were taken by line fishing (Figure 30d). The majority of catches were in winter (Figure 30e). The estimated kept recreational catch of Western Yellowfin Bream in 2017/18 was higher compared with previous statewide surveys, however, the catch estimates for this species have high uncertainty (Figure 30a).



**Figure 30.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Western Yellowfin Bream in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

## 6.2.4 Chinaman Rockcod (*Epinephelus rivulatus*)

Most boat-based recreational catches of Chinaman Rockcod occurred in the Gascoyne Coast, with some catches in the West Coast and North Coast (Figure 31c). Similar proportions of the boat-based recreational catch were kept and released (53% released; Table 4, Figure 31a) with most releases attributed to “Under Size” and “Too Small” (Table 6). Catches were taken predominantly from nearshore and inshore demersal (Figure 31b). Most catches were taken by line fishing (Figure 31d). Chinaman Rockcod were mostly harvested in winter and spring (Figure 31e). The estimated kept recreational catch of Chinaman Rockcod in 2017/18 was higher compared with previous statewide surveys (Figure 31a).

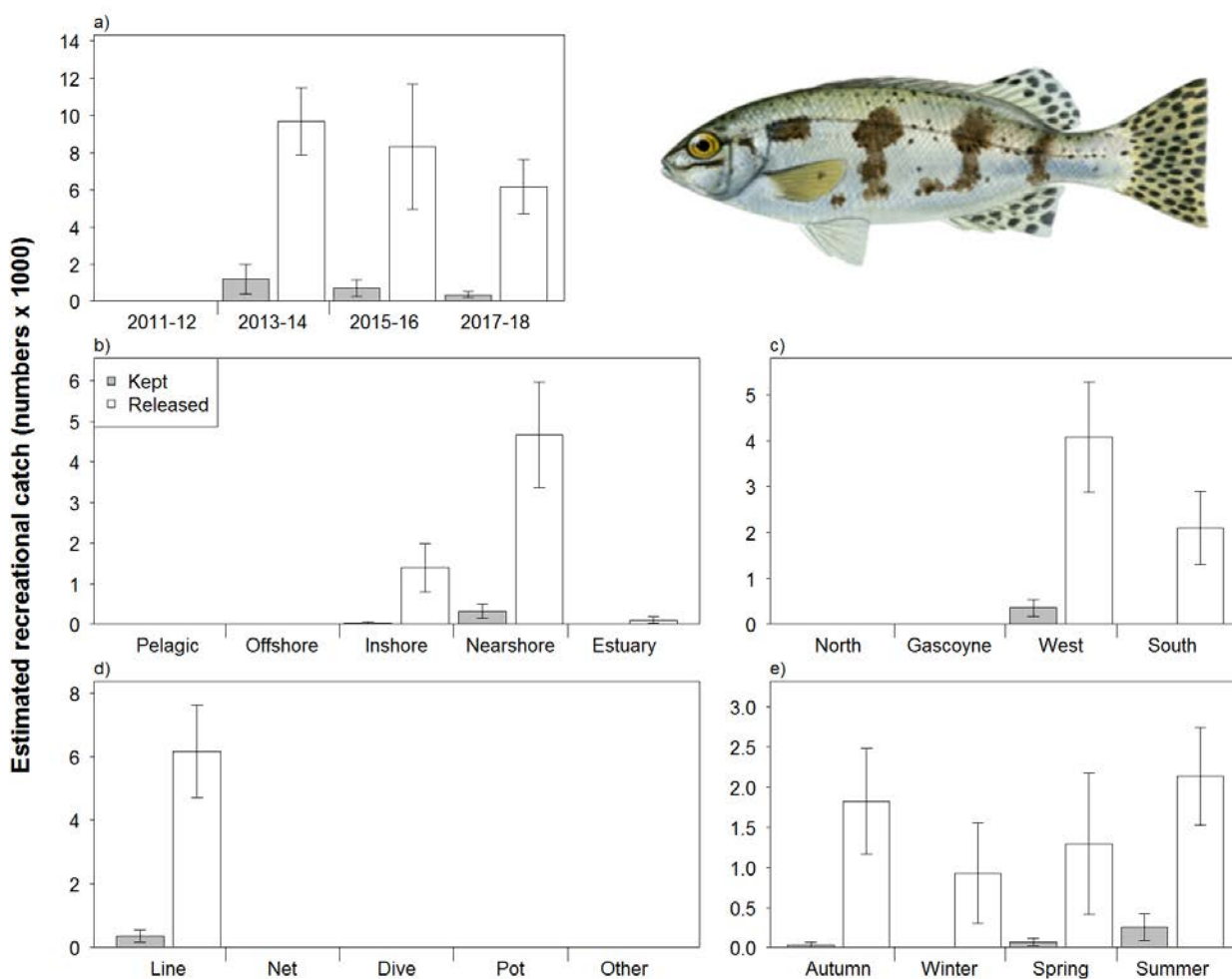


**Figure 31.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Chinaman Rockcod in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.



## 6.2.5 Grunters (*Pelsartia humeralis* and *Pelates octolineatus*)

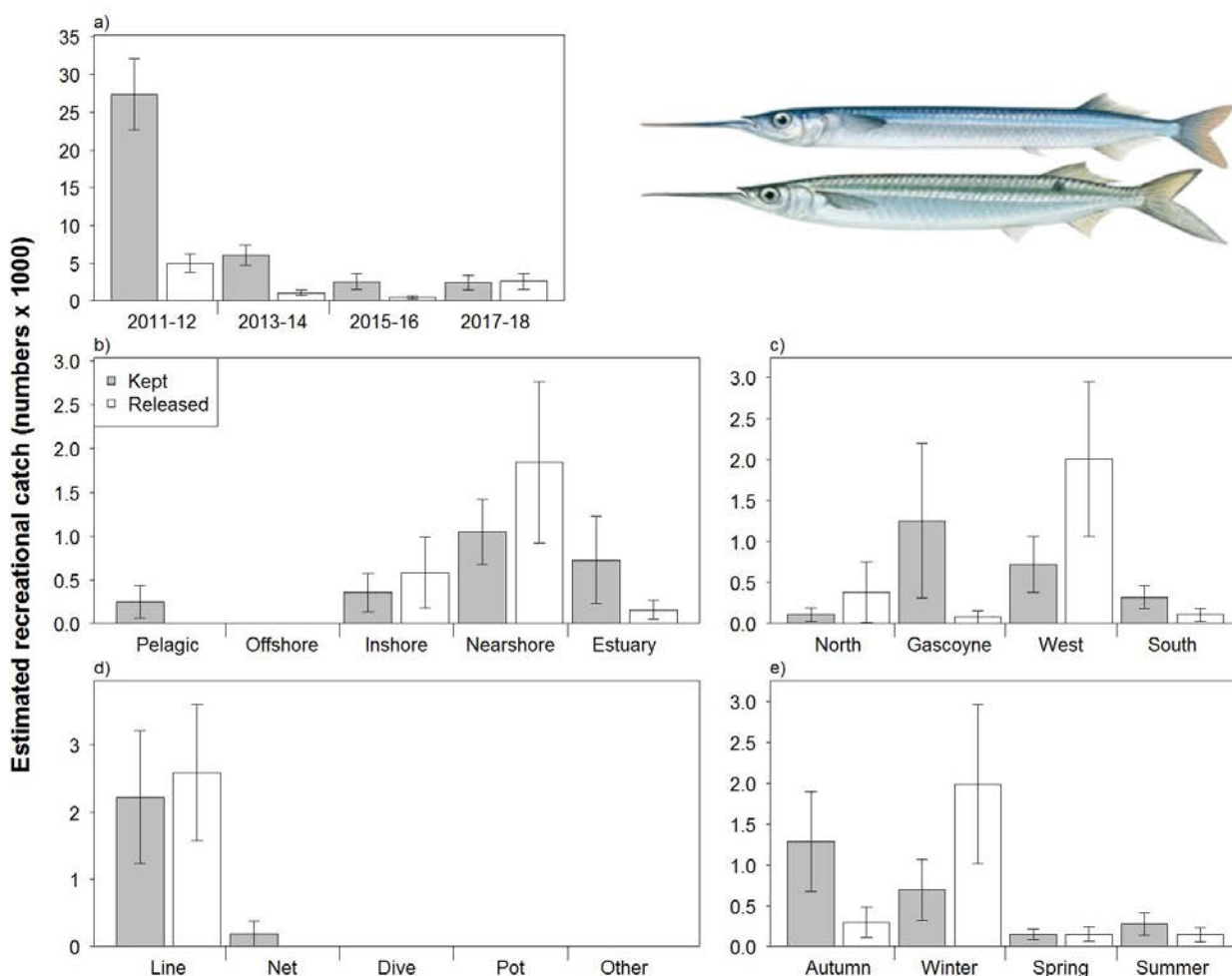
Grunder species include Sea Trumpeter (*Pelsartia humeralis*) and Western Striped Grunder (*Pelates octolineatus*). Most boat-based recreational catches of Grunder occurred in the West Coast, with some catches in the South Coast (Figure 32c). The majority of catches were released (95%; Table 4, Figure 32a) with most releases attributed to "Other" (Table 6). Catches were taken predominantly from nearshore (Figure 32b). All catches were taken by line fishing (Figure 32d). Grunder were caught throughout the year (Figure 32e). The estimated kept and released recreational catches of Grunder in 2017/18 were similar with previous statewide surveys (Figure 32a).



**Figure 32.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Grunder in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.2.6 Garfish (*Hyporhamphus melanochir* and *Hemiramphus robustus*)

Garfish is an indicator species in the West Coast bioregion. Reporting for this species includes Southern Garfish (*Hyporhamphus melanochir*), three-by-two Garfish (*Hemiramphus robustus*) and Other Garfish (Hemiramphidae - undifferentiated). A spatial closure for southern garfish in Metro Zone commenced in 2017. Most boat-based recreational catches of Garfish occurred in the West Coast, with some catches in the Gascoyne Coast and South Coast (Figure 33c). Similar proportions of the boat-based recreational catch were kept and released (52% released; Table 4, Figure 33a). Catches were taken predominantly from nearshore (Figure 33b). Most catches were taken by line fishing (Figure 33d). Garfish were mostly harvested in autumn and winter (Figure 33e). The estimated kept recreational catch of Garfish in 2017/18 was similar to 2015/16, but lower than 2011/12, however, the catch estimates for this species have high uncertainty (Figure 33a).

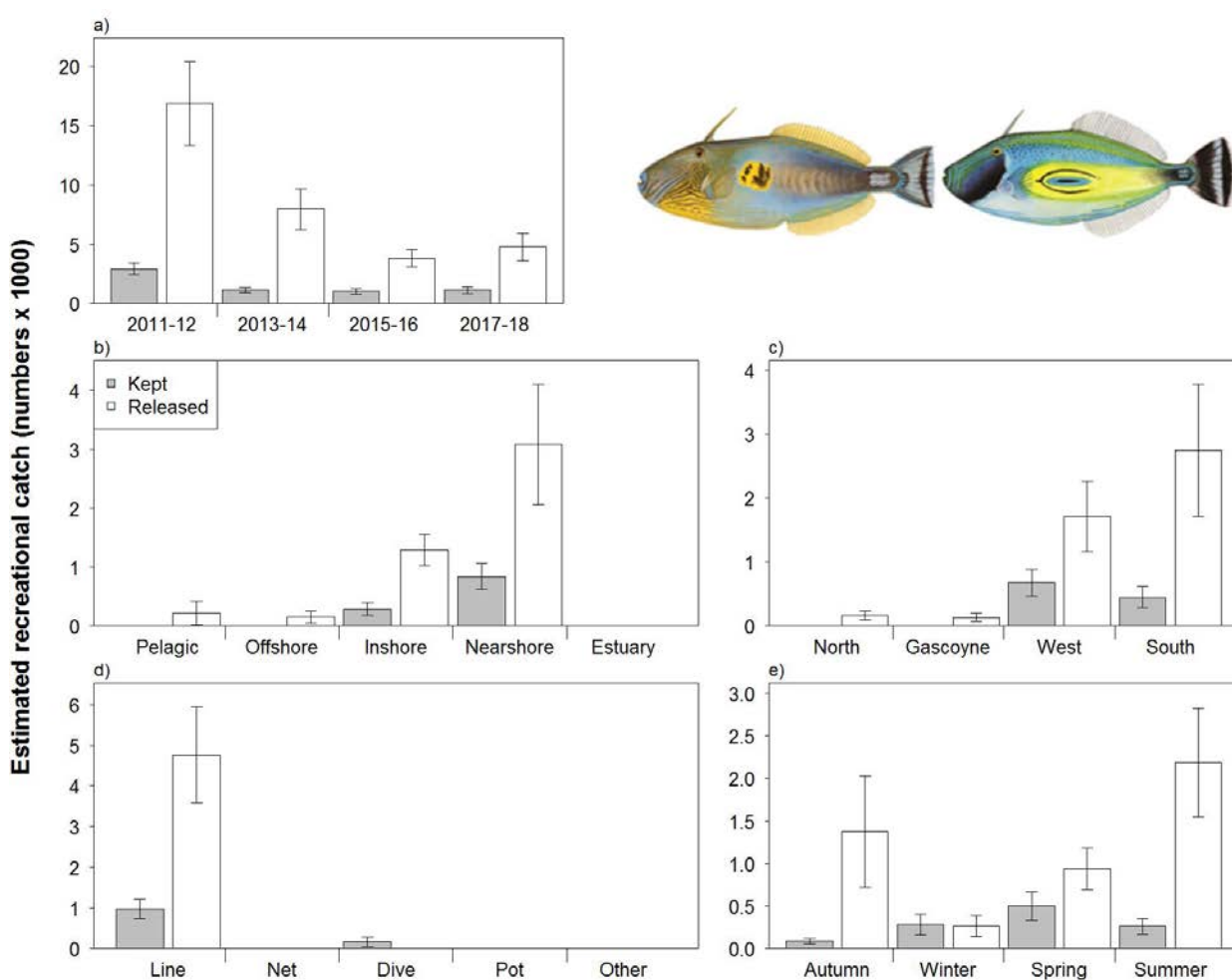


**Figure 33.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Garfish in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.



## 6.2.7 Leatherjacket (Family Monacanthidae)

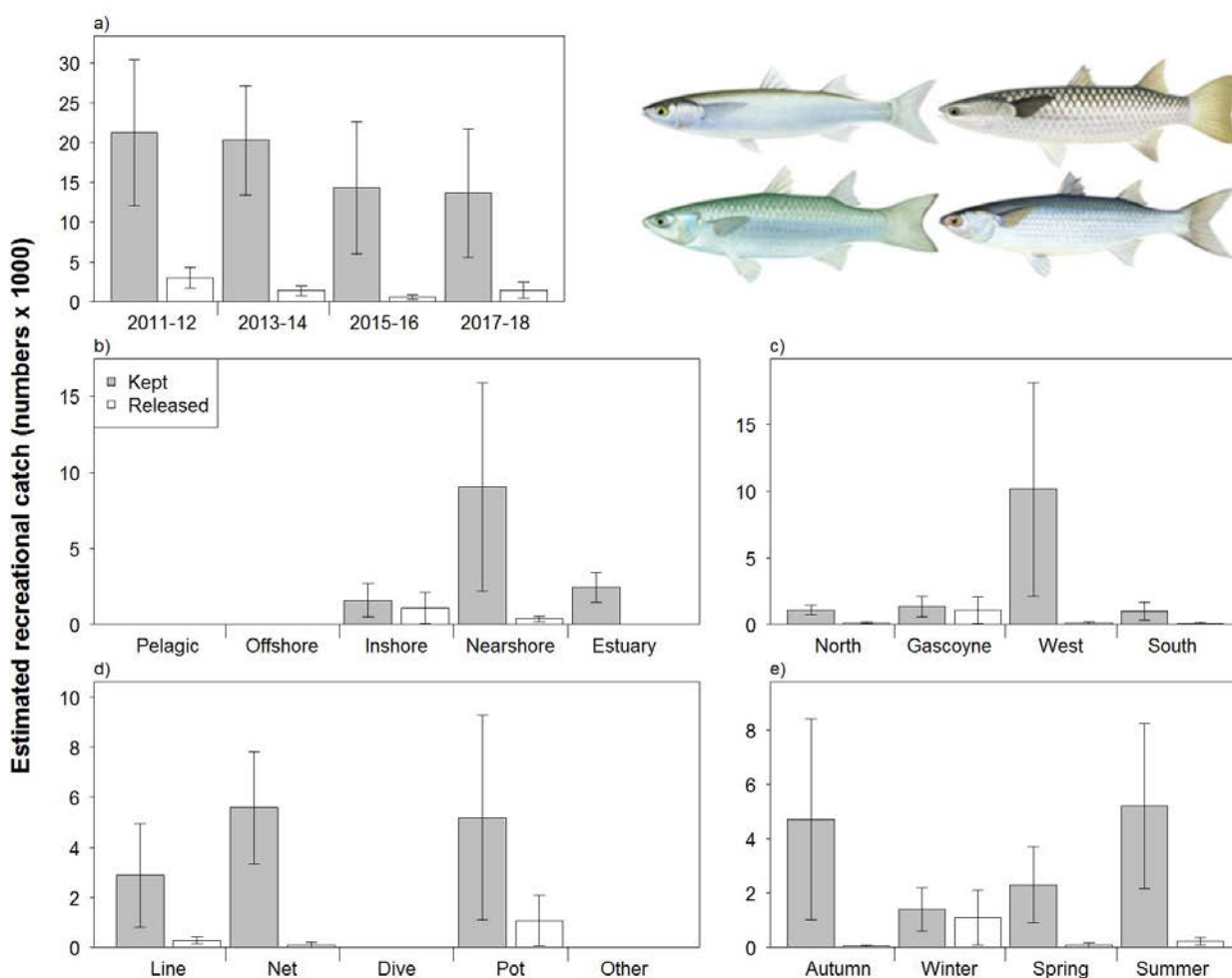
Leatherjacket species include Horseshoe Leatherjacket (*Meuschenia hippocrepis*), Sixspine Leatherjacket (*Meuschenia freycineti*) and Other Leatherjackets (Monacanthidae - undifferentiated). Most boat-based recreational catches of Leatherjacket occurred in the West Coast and South Coast (Figure 34c). The majority of catches were released (81%; Table 4, Figure 34a) with most releases attributed to “Other” and “Too Many” (Table 6). Catches were taken predominantly from nearshore and inshore demersal (Figure 34b). Most catches were taken by line fishing (Figure 34d). Leatherjacket were harvested throughout the year, with higher catches in spring (Figure 34e). The estimated kept recreational catch of Leatherjacket in 2017/18 was similar with previous statewide surveys (Figure 34a).



**Figure 34.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Leatherjacket in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

## 6.2.8 Mullet (Family Mugilidae)

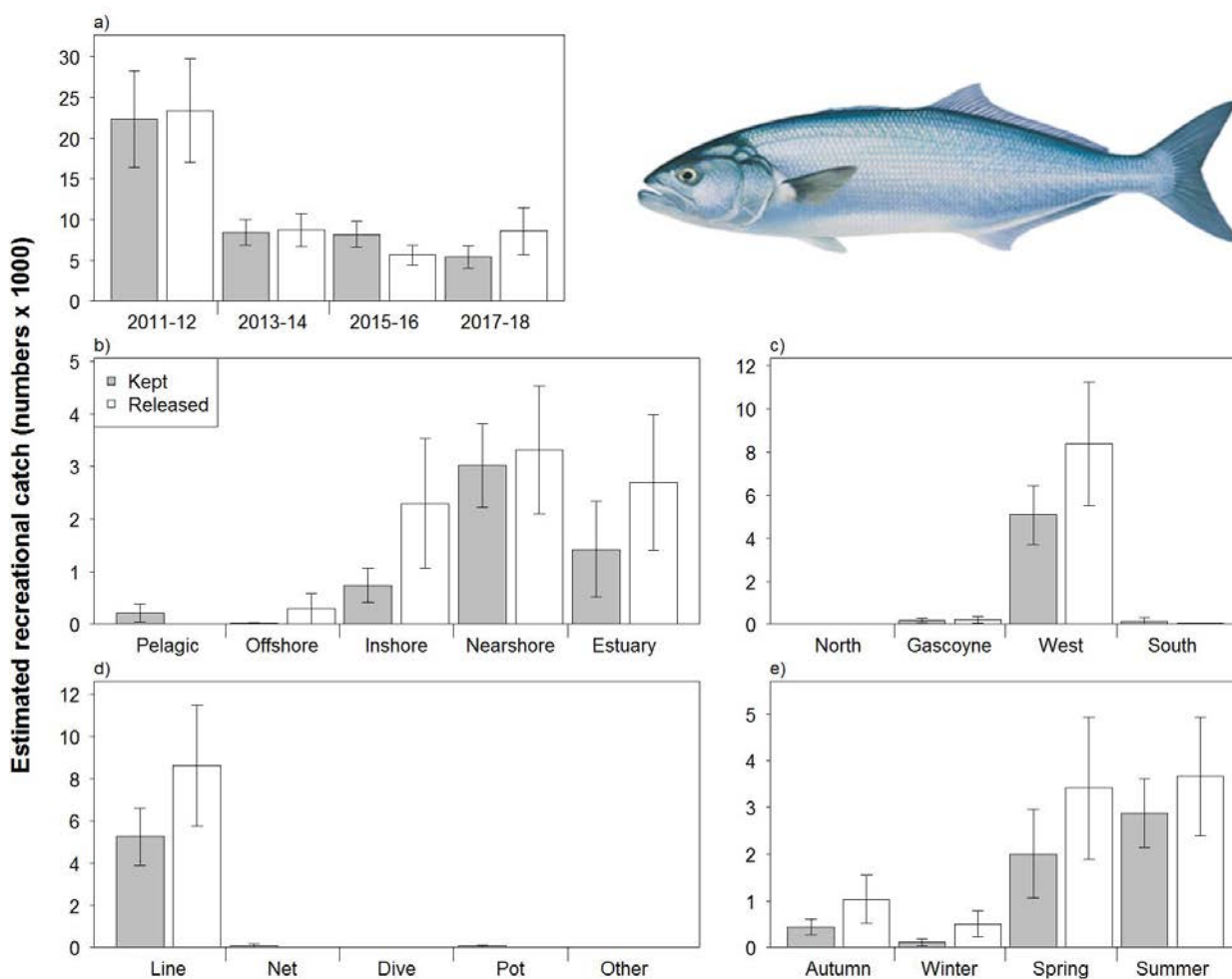
Mullet species include Sea Mullet (*Mugil cephalus*), Bluetail Mullet (*Valamugil bouchanani*), Diamondscale Mullet (*Liza vaigiensis*), Greenback Mullet (*Liza subviridis*), Yelloweye Mullet (*Aldrichetta forsteri*) and Other Mullet (Mugilidae - undifferentiated). Sea Mullet is an indicator species in the Gascoyne, West and South Coast bioregions. Most boat-based recreational catches of Mullet occurred in the West Coast, with some catches in the North Coast, Gascoyne Coast and South Coast (Figure 35c). The majority of catches were retained (10% released; Table 4, Figure 35a). Catches were taken predominantly from nearshore (Figure 35b). Catches were mostly taken by netting, followed by potting and line fishing (Figure 35d). Mullet were harvested throughout the year, with higher catches in summer and autumn compared with winter and spring (Figure 35e). The estimated kept and released recreational catches of Mullet in 2017/18 were similar with previous statewide surveys, however, the catch estimates for this species have high uncertainty (Figure 35a).



**Figure 35.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Mullet in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.2.9 Tailor (*Pomatomus saltatrix*)

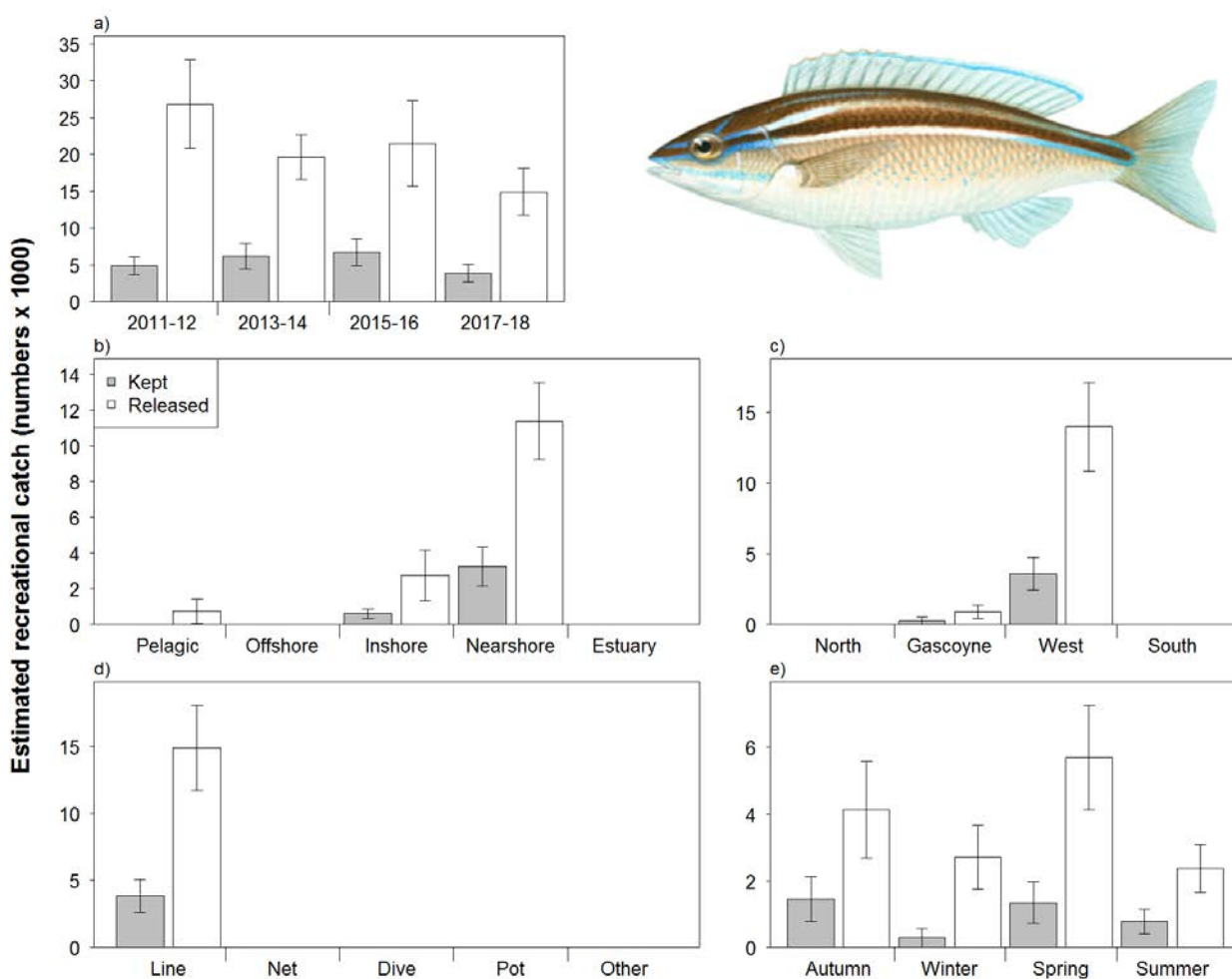
Tailor is an indicator species in the Gascoyne Coast and West Coast bioregions. Most boat-based recreational catches of Tailor occurred in the West Coast, with some catches in the Gascoyne Coast and South Coast (Figure 36c). The majority of catches were released (61%; Table 4, Figure 36a) with most releases attributed to "Under Size" and "Catch and Release" (Table 6). Catches were taken predominantly from nearshore (Figure 36b). Catches were mostly taken by line fishing (Figure 36d). Tailor were mostly harvested in spring and summer (Figure 36e). The estimated kept and released recreational catches of Tailor in 2017/18 were similar to 2015/16 and 2013/14, but lower than 2011/12 (Figure 36a).



**Figure 36.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Tailor in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.2.10 Western Butterfish (*Pentapodus vitta*)

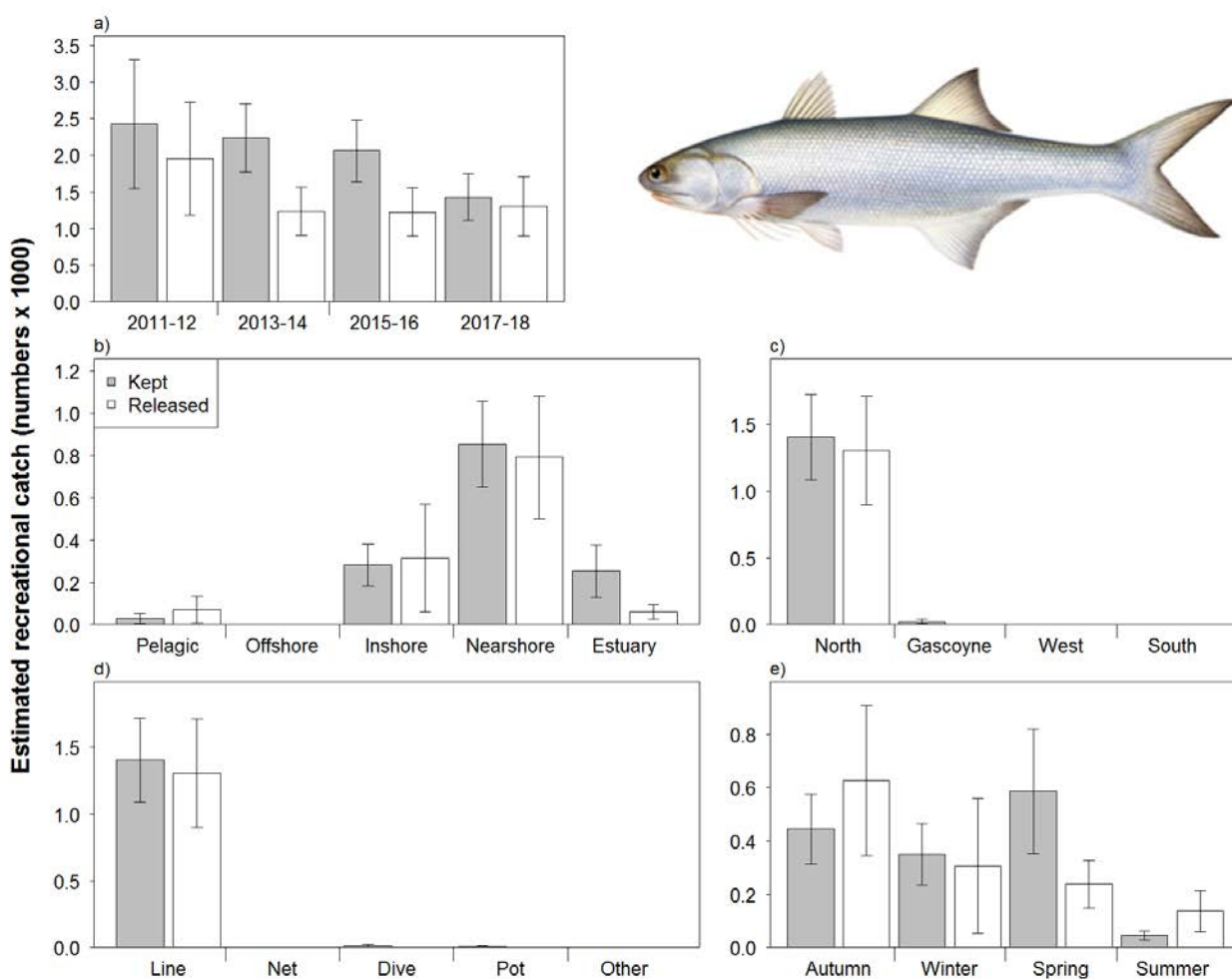
Most boat-based recreational catches of Western Butterfish occurred in the West Coast, with some catches in the Gascoyne Coast (Figure 37c). The majority of catches were released (79%; Table 5, Figure 37a) with most releases attributed to “Other” and “Too Many” (Table 6). Catches were taken predominantly from nearshore (Figure 37b). All catches were taken by line fishing (Figure 37d). Western Butterfish were harvested throughout the year, with higher catches in spring, summer and autumn (Figure 37e). The estimated kept and released recreational catches of Western Butterfish in 2017/18 were similar with previous statewide surveys (Figure 37a).



**Figure 37.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Western Butterfish in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.2.11 Blue Threadfin (*Eleutheronema tetradactylum*)

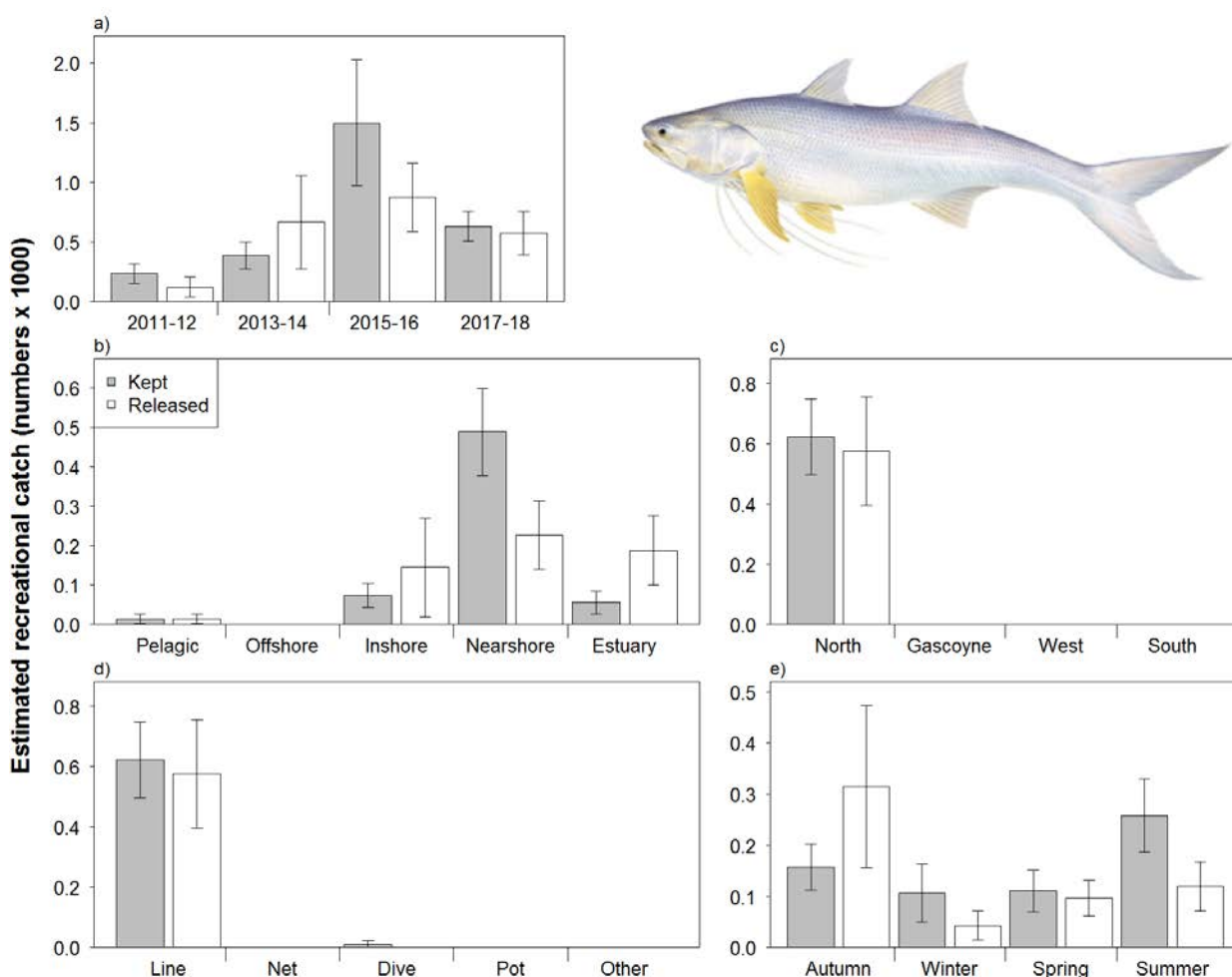
Blue Threadfin is an indicator species in the North Coast bioregion. Reporting for this species includes catches for Striped threadfin (*Polydactylus plebius*). Most boat-based recreational catches of Blue Threadfin occurred in the North Coast (Figure 38c). Similar proportions of the boat-based recreational catch were kept and released (48% released; Table 4, Figure 38a) with most releases attributed to “Too Many” and “Under Size” (Table 6). Catches were taken from nearshore, inshore demersal and estuary (Figure 38b). Most catches were taken by line fishing (Figure 38d). Blue Threadfin were mostly harvested in autumn, winter and spring (Figure 38e). The estimated kept and released recreational catches of Blue Threadfin in 2017/18 were similar with previous statewide surveys (Figure 38a).



**Figure 38.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Blue Threadfin in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.2.12 King Threadfin (*Polydactylus macrochir*)

King Threadfin is an indicator species in the North Coast bioregion. All boat-based recreational catches of King Threadfin occurred in the North Coast (Figure 39c). The majority of released were attributed to "Under Size" (Table 6). Catches were taken predominantly from nearshore (Figure 39b). King Threadfin were harvested throughout the year, with higher catches in summer and autumn compared with winter and spring (Figure 39e). All catches were taken by line fishing (Figure 39d). The estimated kept recreational catch of King Threadfin in 2017/18 was lower compared with 2015/16, but similar with 2013/14 and 2011/12 (Figure 39a).

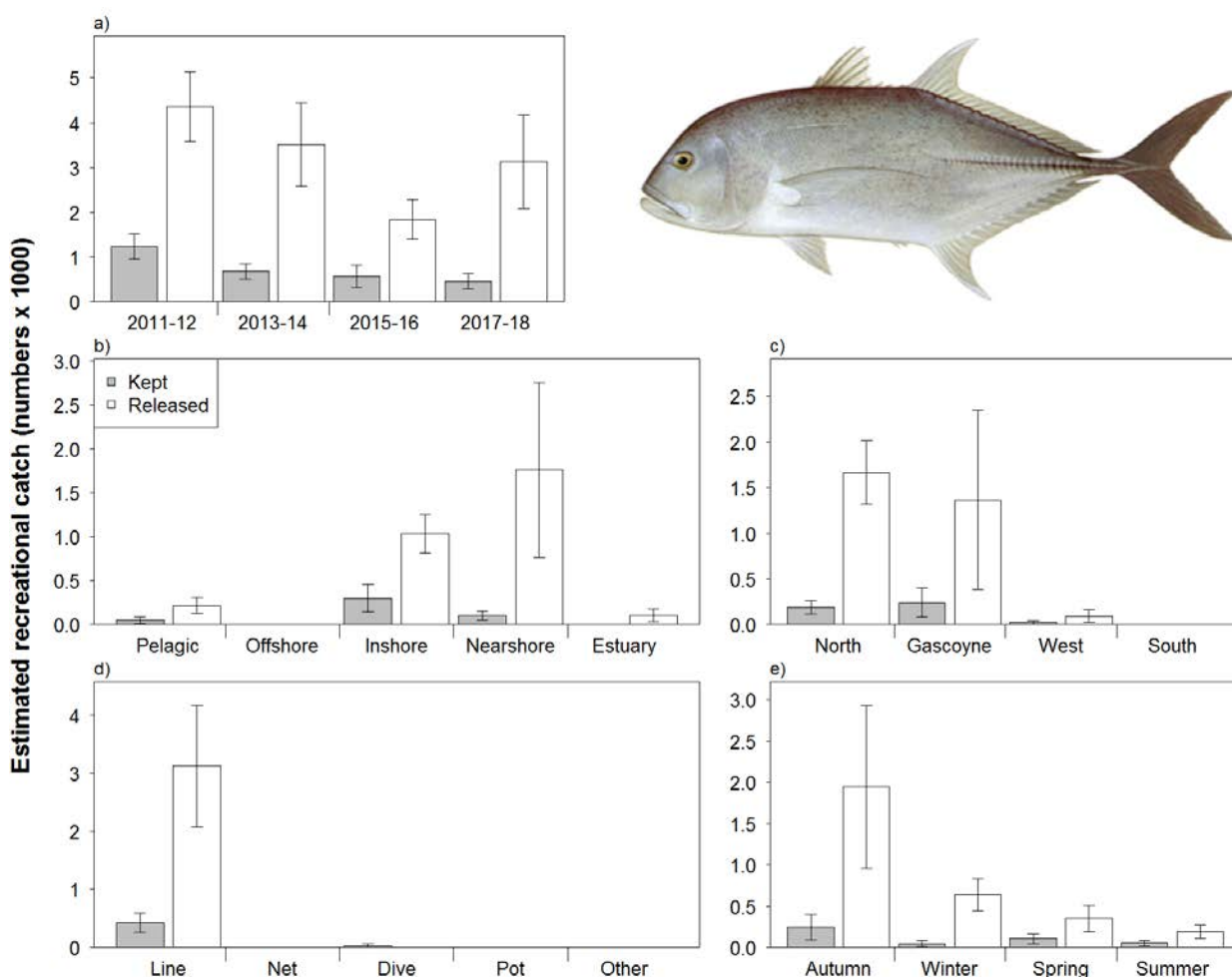


**Figure 39.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of King Threadfin in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.



### 6.2.13 Giant Trevally (*Caranx ignobilis*)

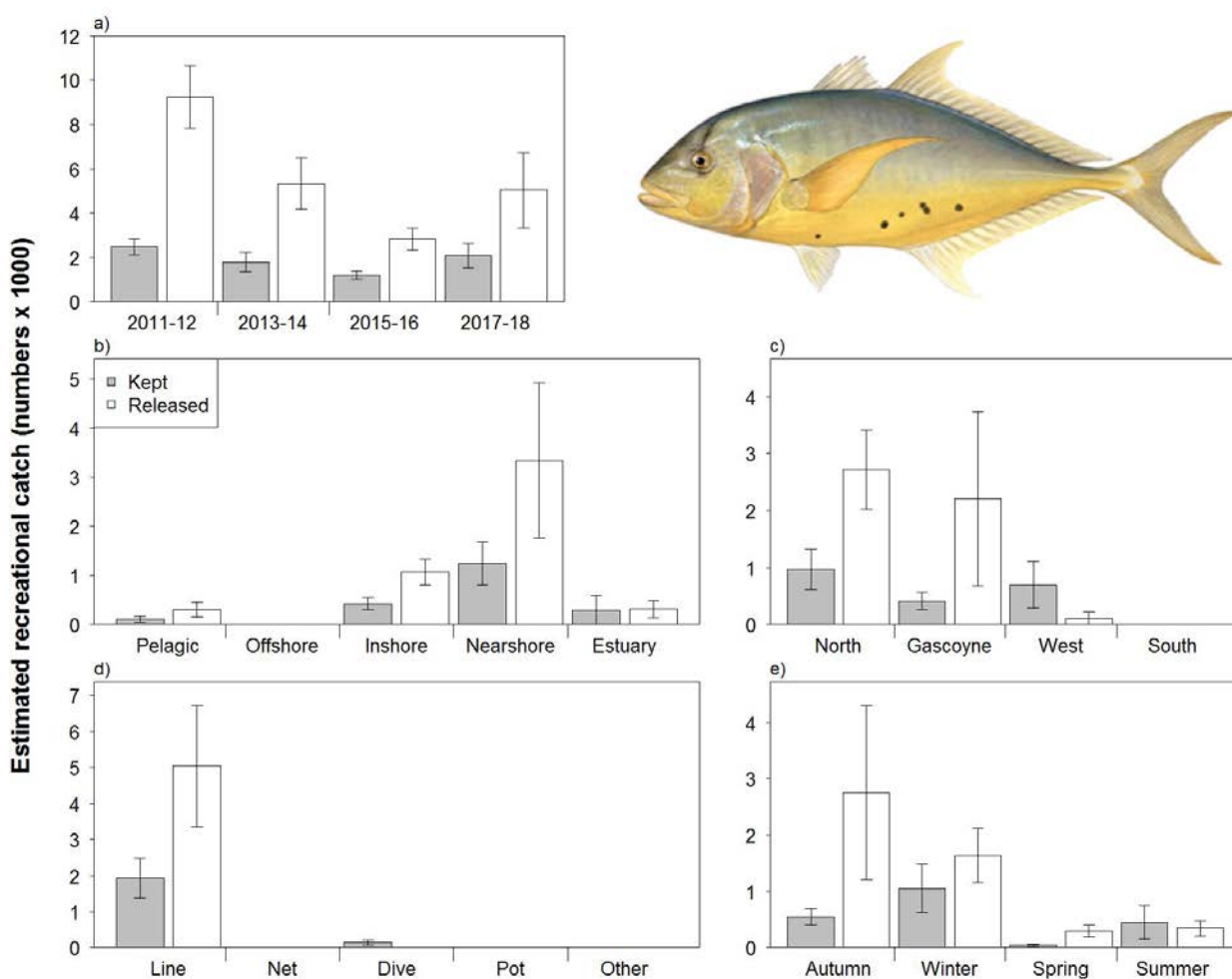
Most boat-based recreational catches of Giant Trevally occurred in the North Coast and Gascoyne Coast, with some catches in the West Coast (Figure 40c). The majority of catches were released (87%; Table 4, Figure 40a) with most releases attributed to "Catch and Release" (Table 6). Catches were taken predominantly from inshore demersal and nearshore (Figure 40b). Most catches were taken by line fishing (Figure 40d). Giant Trevally were harvested throughout the year (Figure 40e). The estimated kept and released recreational catches of Giant Trevally in 2017/18 were similar with previous statewide surveys (Figure 40a).



**Figure 40.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Golden Trevally in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.2.14 Golden Trevally (*Gnathanodon speciosus*)

Most boat-based recreational catches of Golden Trevally occurred in the North Coast, with some catches in the Gascoyne Coast and West Coast (Figure 41c). The majority of catches were released (71%; Table 4, Figure 41a) with most releases attributed to "Catch and Release" (Table 6). Catches were taken predominantly from nearshore and inshore demersal (Figure 41b). Most catches were taken by line fishing (Figure 41d). Golden Trevally were mostly harvested in autumn and winter (Figure 41e). The estimated kept recreational catch of Golden Trevally in 2017/18 was similar with previous statewide surveys (Figure 41a).

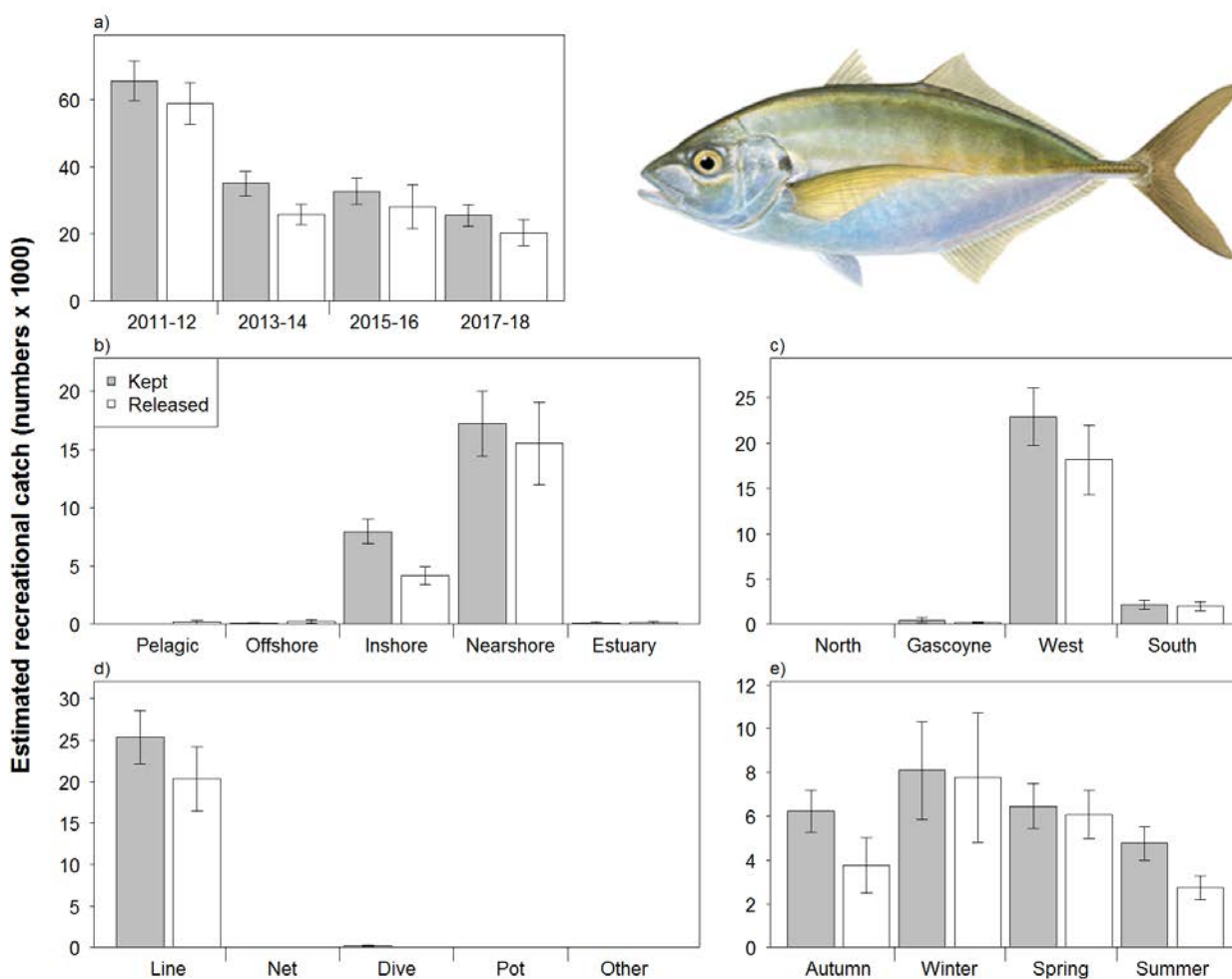


**Figure 41.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Golden Trevally in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.



### 6.2.15 Silver Trevally (*Pseudocaranx* spp. complex)

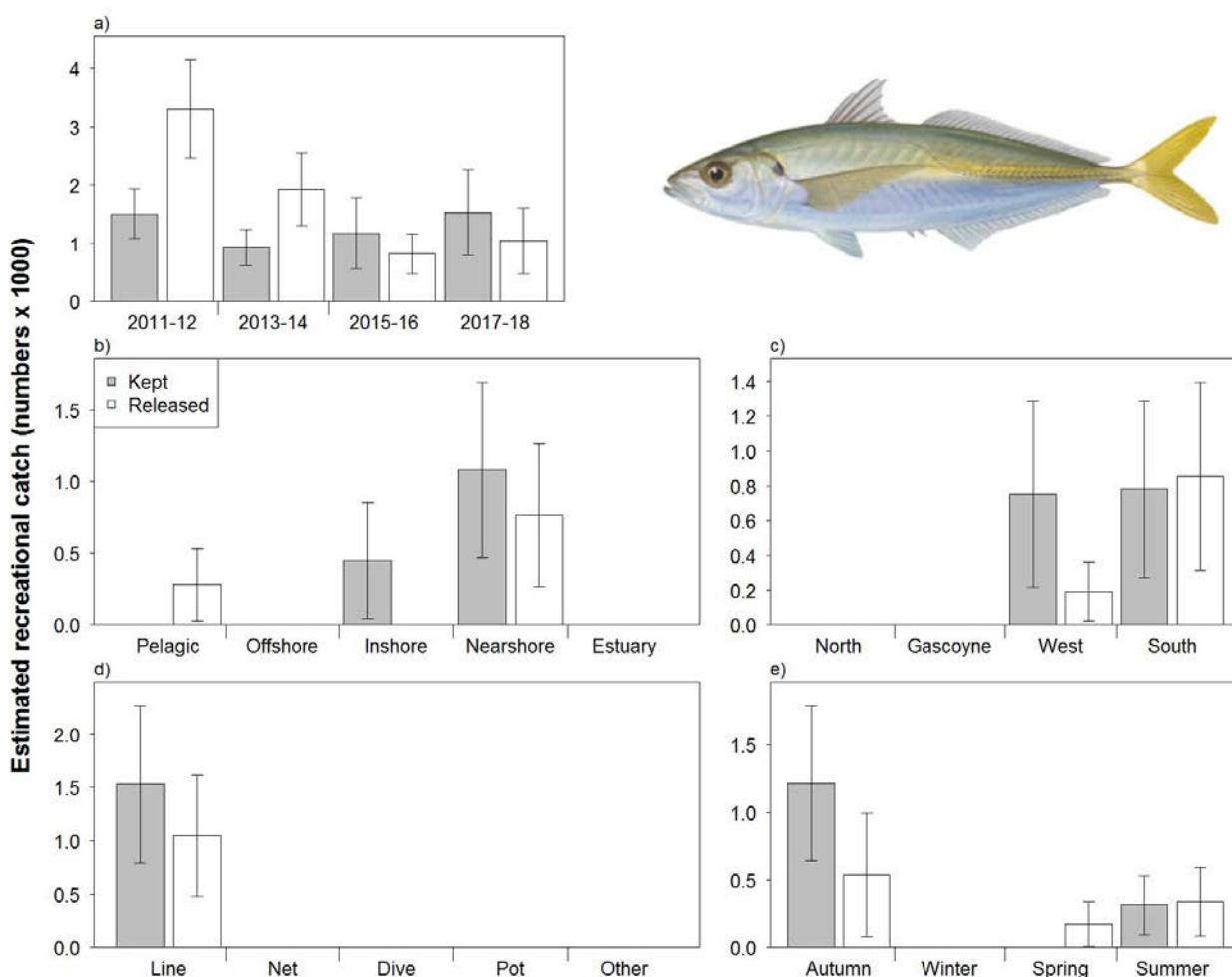
Most boat-based recreational catches of Silver Trevally occurred in the West Coast, with some catches in the South Coast (Figure 42c). The majority of catches were retained (44% released; Table 5, Figure 42a) with most releases attributed to “Under Size” and “Too Small” (Table 6). Catches were taken predominantly from nearshore and inshore demersal (Figure 42b). Silver Trevally were harvested throughout the year, with similar catches in each season (Figure 42e). Catches were mostly taken by line fishing (Figure 42d). The estimated kept and released recreational catches of Silver Trevally in 2017/18 were similar to 2015/16 and 2013/14, but lower than 2011/12 (Figure 42a).



**Figure 42.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Silver Trevally in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.2.16 Yellowtail Scad (*Trachurus novaezelandiae*)

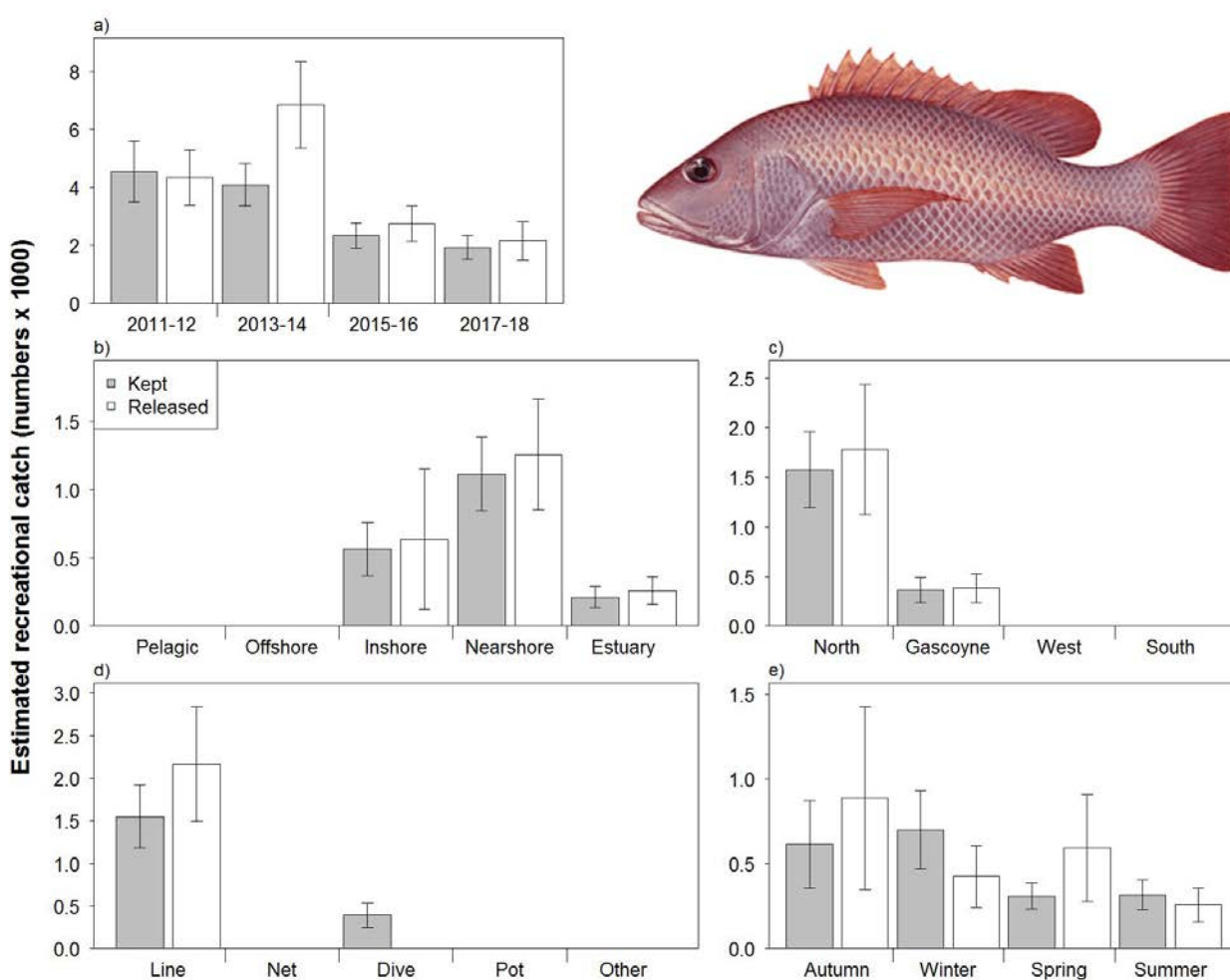
Yellowtail Scad is an indicator species in the South Coast bioregion. Most boat-based recreational catches of Yellowtail Scad occurred in the West Coast and South Coast (Figure 43c). The majority of catches were retained (41% released; Table 4, Figure 43a). Catches were taken predominantly from nearshore and inshore demersal (Figure 43b). All catches were taken by line fishing (Figure 43d). Yellowtail Scad were mostly harvested in summer and autumn (Figure 43e). The estimated kept recreational catch of Yellowtail Scad in 2017/18 was similar with previous statewide surveys; however, the catch estimates for this species have high uncertainty (Figure 43a).



**Figure 43.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Yellowtail Scad in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.2.17 Mangrove Jack (*Lutjanus argentimaculatus*)

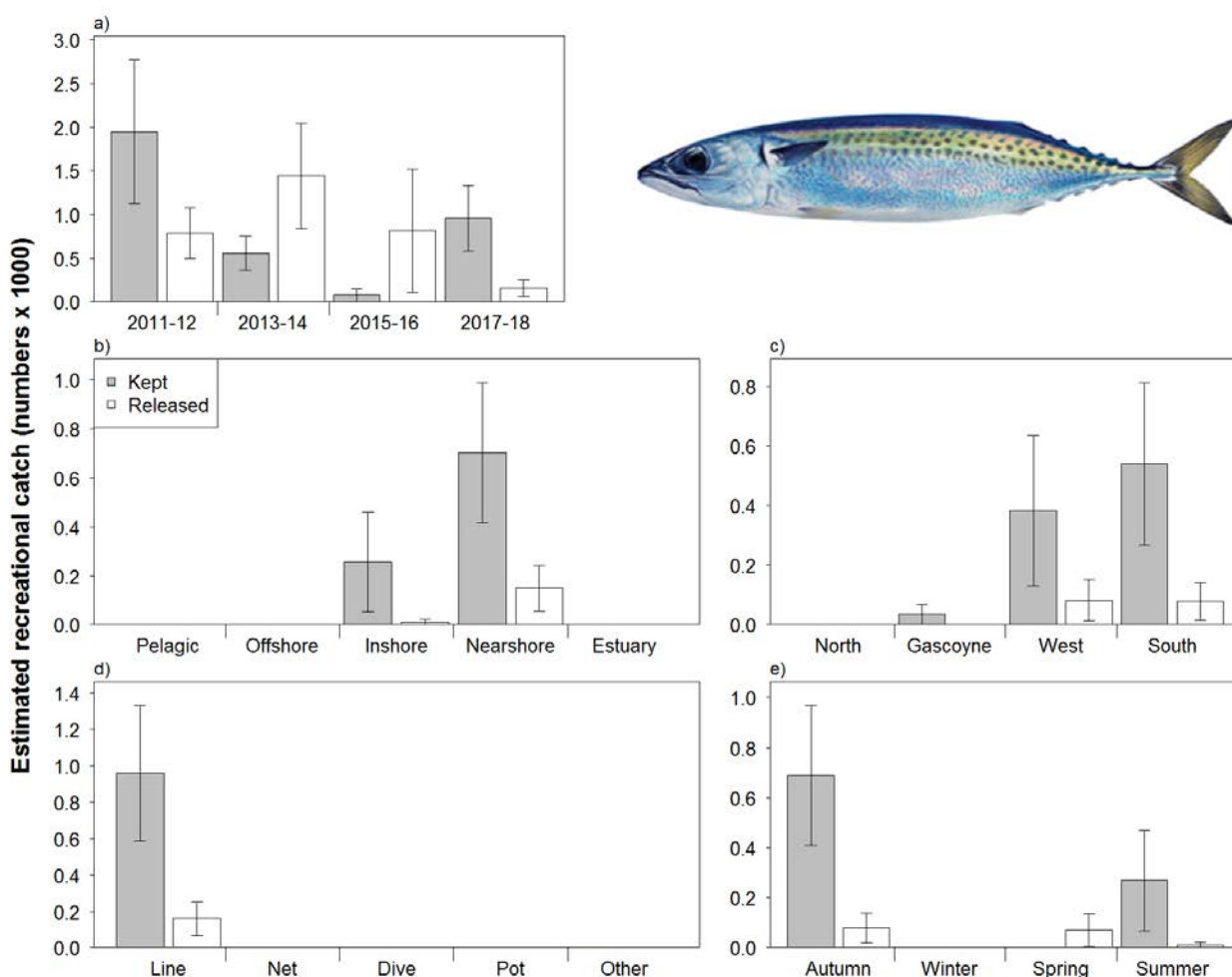
Mangrove Jack is an indicator species in the North Coast bioregion. Most boat-based recreational catches of Mangrove Jack occurred in the North Coast, with some catches in the Gascoyne Coast (Figure 44c). Similar proportions of the boat-based recreational catch were kept and released (53% released; Table 5, Figure 44a) with most releases attributed to “Under Size” and “Too Small” (Table 6). Catches were taken predominantly from nearshore, inshore demersal and estuary (Figure 44b). Most catches were taken by line fishing (Figure 44d). Mangrove Jack were harvested throughout the year, with higher catches in autumn and winter compared with spring and summer (Figure 44e). The estimated kept and released recreational catches of Mangrove Jack in 2017/18 were similar to 2015/16, but lower than 2013/14 and 2011/12 (Figure 44a).



**Figure 44.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Mangrove Jack in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.2.18 Blue Mackerel (*Scomber australasicus*)

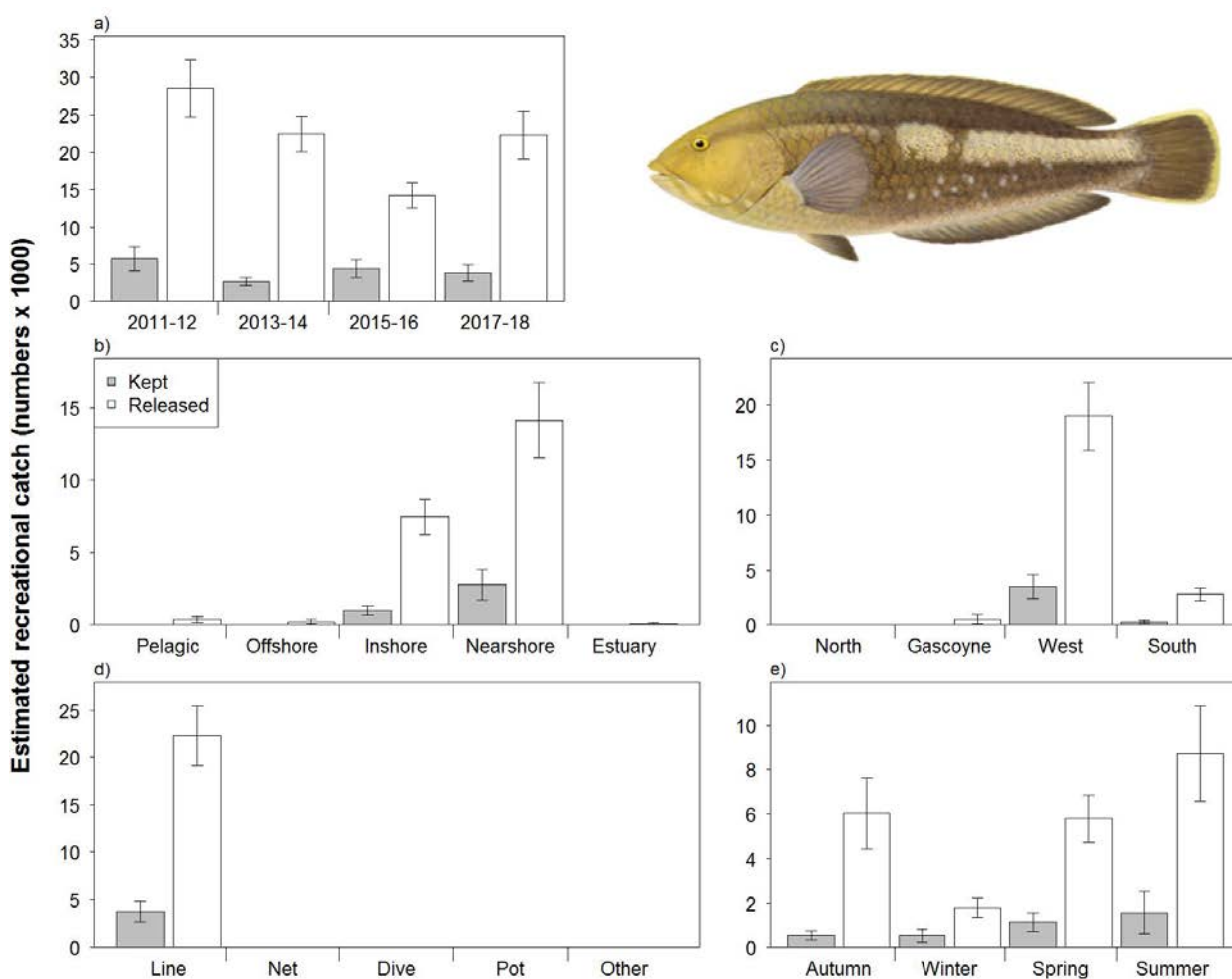
Most boat-based recreational catches of Blue Mackerel occurred in the South Coast and West Coast (Figure 45c). The majority of catches were retained (14% released; Table 4, Figure 45a). Catches were taken predominantly from nearshore and inshore demersal (Figure 45b). All catches were taken by line fishing (Figure 45d). Blue Mackerel were mostly harvested in summer and autumn (Figure 45e). The estimated kept recreational catch of Blue Mackerel in 2017/18 was higher than 2015/16; however, the catch estimates for this species have high uncertainty (Figure 45a).



**Figure 45.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Blue Mackerel in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.2.19 Brownspotted Wrasse (*Notolabrus parilus*)

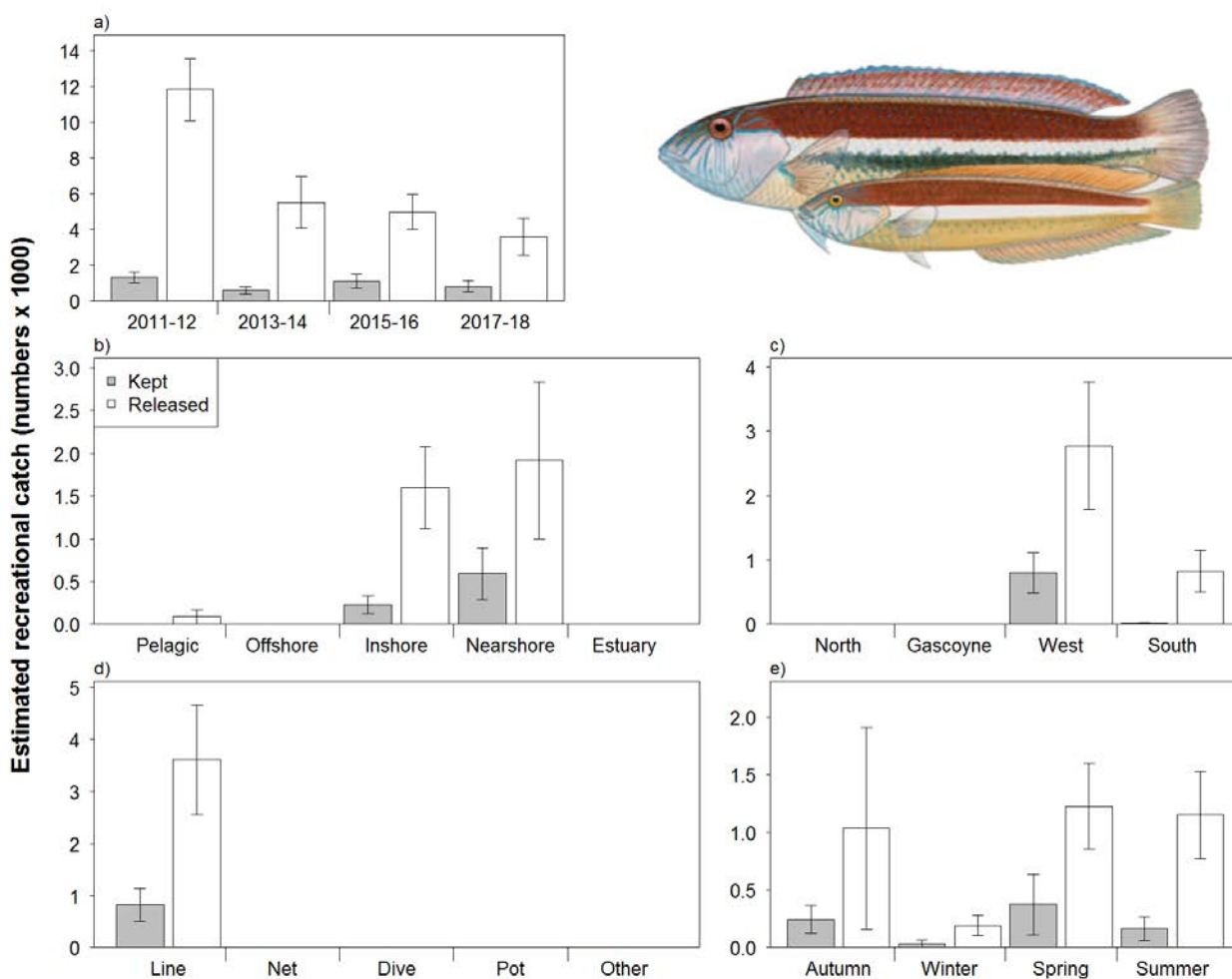
Most boat-based recreational catches of Brownspotted Wrasse occurred in the West Coast, with some catches in the South Coast (Figure 46c). The majority of catches were released (85%; Table 5, Figure 46a) with most releases attributed to “Other” and “Too Many” (Table 6). Catches were taken predominantly from nearshore (Figure 46b). All catches were taken by line fishing (Figure 46d). Brownspotted Wrasse were harvested throughout the year, with with lower catches in winter (Figure 46e). The estimated kept and released recreational catches of Brownspotted Wrasse in 2017/18 were similar with previous statewide surveys (Figure 46a).



**Figure 46.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Brownspotted Wrasse in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.2.20 Southern Maori Wrasse (*Ophthalmolepis lineolatus*)

Most boat-based recreational catches of Southern Maori Wrasse occurred in the West Coast, with some catches in the South Coast (Figure 47c). The majority of catches of Southern Maori Wrasse were released (81%; Table 4, Figure 47a) with most releases attributed to "Too Many" and "Other" (Table 6). Catches were taken predominantly from nearshore and inshore demersal (Figure 47b). All catches were taken by line fishing (Figure 47d). Southern Maori Wrasse were mostly harvested in spring, summer and autumn (Figure 47e). The estimated kept recreational catch of Southern Maori Wrasse in 2017/18 were similar with previous statewide surveys, although the estimated released recreational catch was similar to 2015/6 and 2013/14 but lower than 2011/12 (Figure 47a).

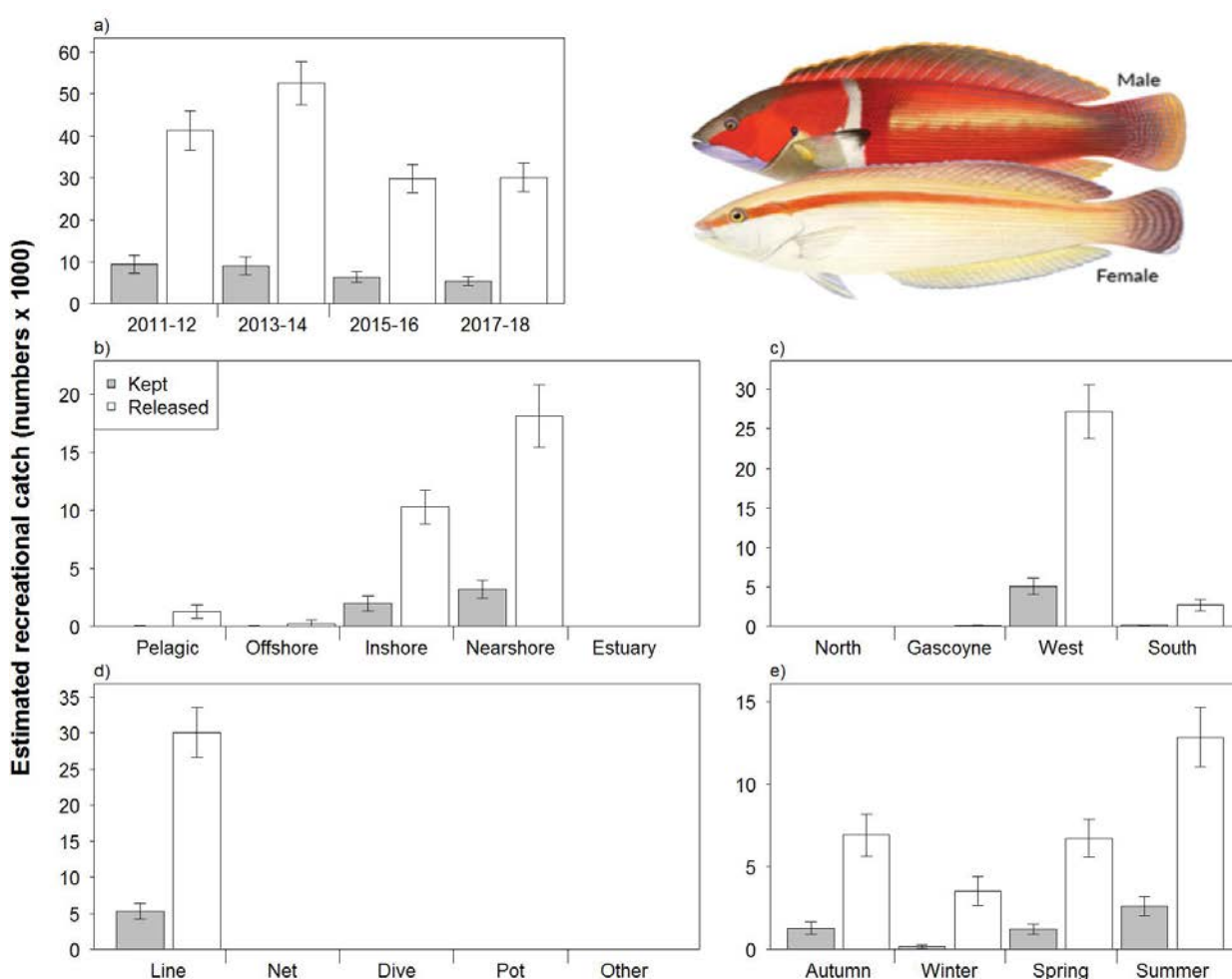


**Figure 47.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Southern Maori Wrasse in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.



### 6.2.21 Western King Wrasse (*Coris auricularis*)

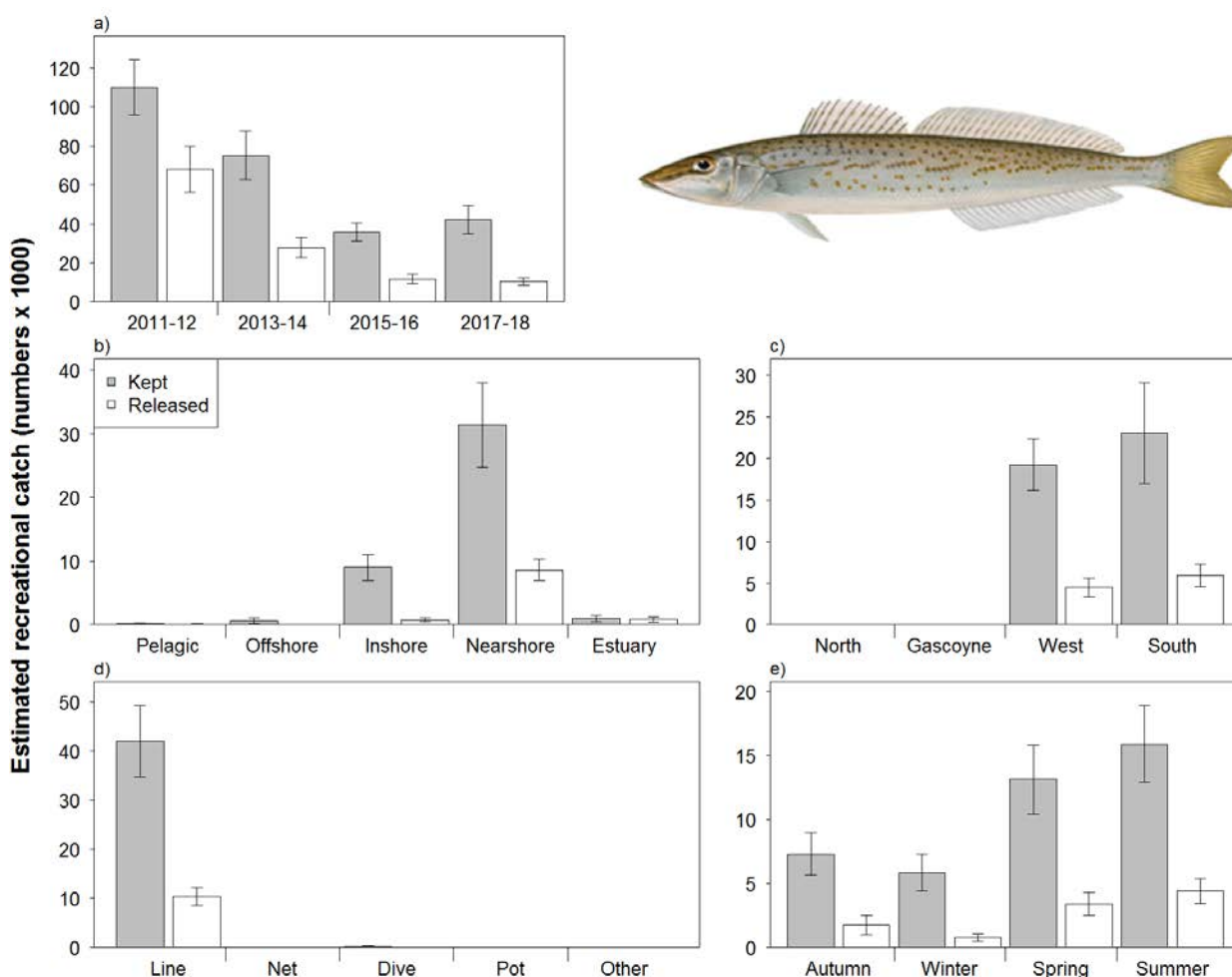
Most boat-based recreational catches of Western King Wrasse occurred in the West Coast, with some catches in the South Coast (Figure 48c). The majority of catches were released (85%; Table 5, Figure 48a) with most releases attributed to “Other” and “Too Many” (Table 6). Catches were taken predominantly from nearshore and inshore demersal (Figure 48b). All catches were taken by line fishing (Figure 48d). Western King Wrasse were harvested throughout the year, with higher catches in spring, summer and autumn compared with winter (Figure 48e). The estimated kept recreational catch of Western King Wrasse in 2017/18 was similar with previous statewide surveys, although the estimated released recreational catch was similar to 2015/6 but lower than 2013/14 and 2011/12 (Figure 48a).



**Figure 48.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Western King Wrasse in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.2.22 King George Whiting (*Sillaginodes punctatus*)

Whiting species, including King George Whiting, are indicator species in the Gascoyne Coast, South Coast and West Coast bioregions. Boat-based recreational catches of King George Whiting occurred in the West Coast and South Coast (Figure 49c). The majority of catches were retained (20% released; Table 4, Figure 49a) with most releases attributed to "Under Size" and "Too Small" (Table 6). Catches were taken predominantly from nearshore and inshore demersal (Figure 49b). Most catches were taken by line fishing (Figure 49d). King George Whiting were harvested throughout the year, with higher catches in spring and summer compared with autumn and winter (Figure 49e). The estimated kept and released recreational catch of King George Whiting in 2017/18 was similar to 2015/16, but lower than 2013/14 and 2011/12 (Figure 49a).

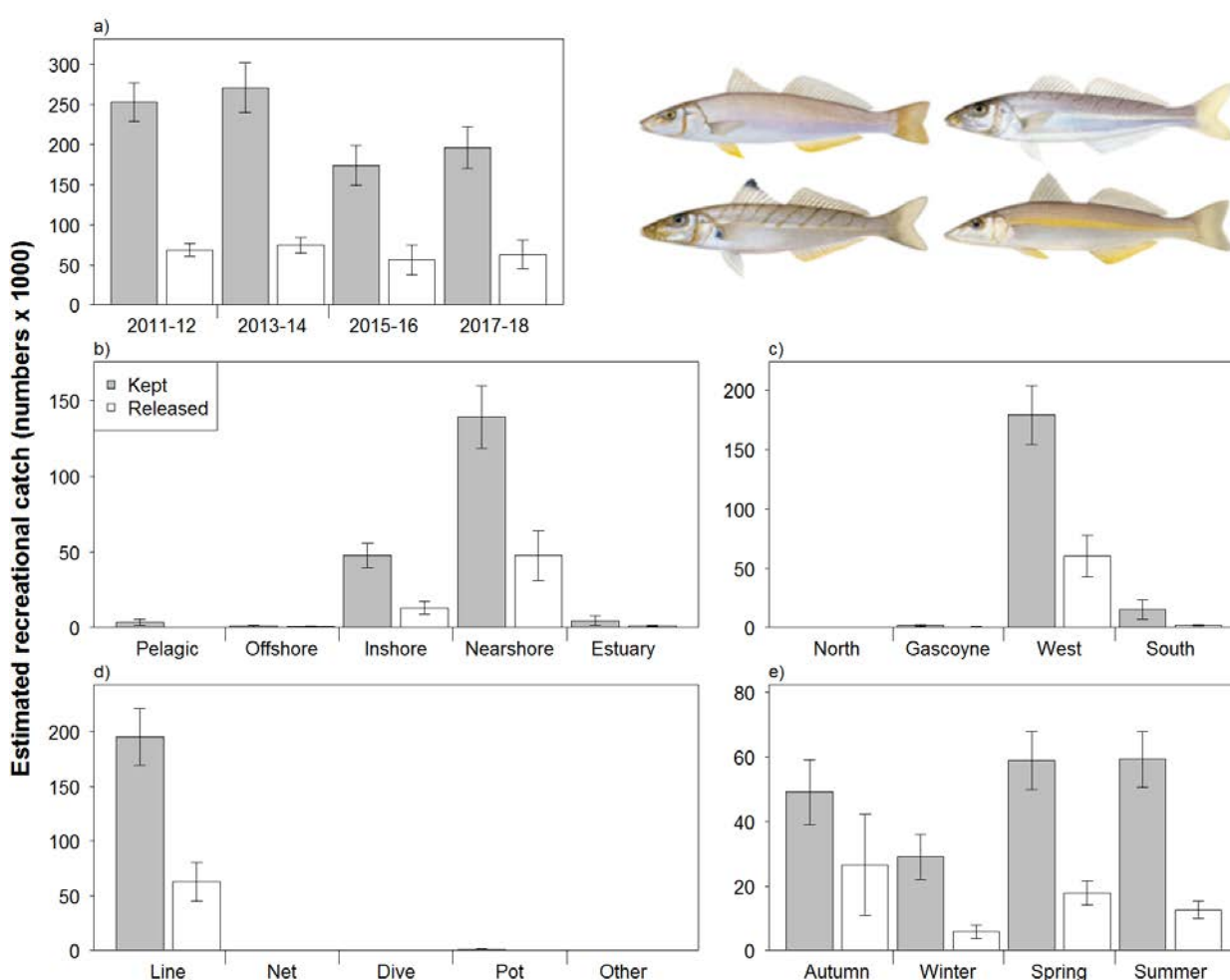


**Figure 49.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of King George Whiting in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.



### 6.2.23 School Whiting (*Sillago bassensis*, *vittata* and *schomburgkii*)

Whiting species, including School and Yellowfin Whiting, are indicator species in the Gascoyne Coast, South Coast and West Coast bioregions. School Whiting includes Southern School Whiting (*Sillago bassensis*), Western School Whiting (*S. vittata*) and Yellowfin Whiting (*S. schomburgkii*). Most boat-based recreational catches of School Whiting occurred in the West Coast, with some catches in the South Coast and Gascoyne Coast (Figure 50c). The majority of catches were retained (24% released; Table 4, Figure 50a) with most releases attributed to “Too Small” and “Under Size” (Table 6). Catches were taken predominantly from nearshore and inshore demersal (Figure 50b). Most catches were taken by line fishing (Figure 50d). School Whiting were harvested throughout the year, with lower catches in winter (Figure 50e). The estimated kept recreational catch of School Whiting in 2017/18 was similar to 2015/16, but lower than 2013/14 and 2011/12, and the estimated released recreational catch in 2017/18 was similar with previous statewide surveys (Figure 50a).

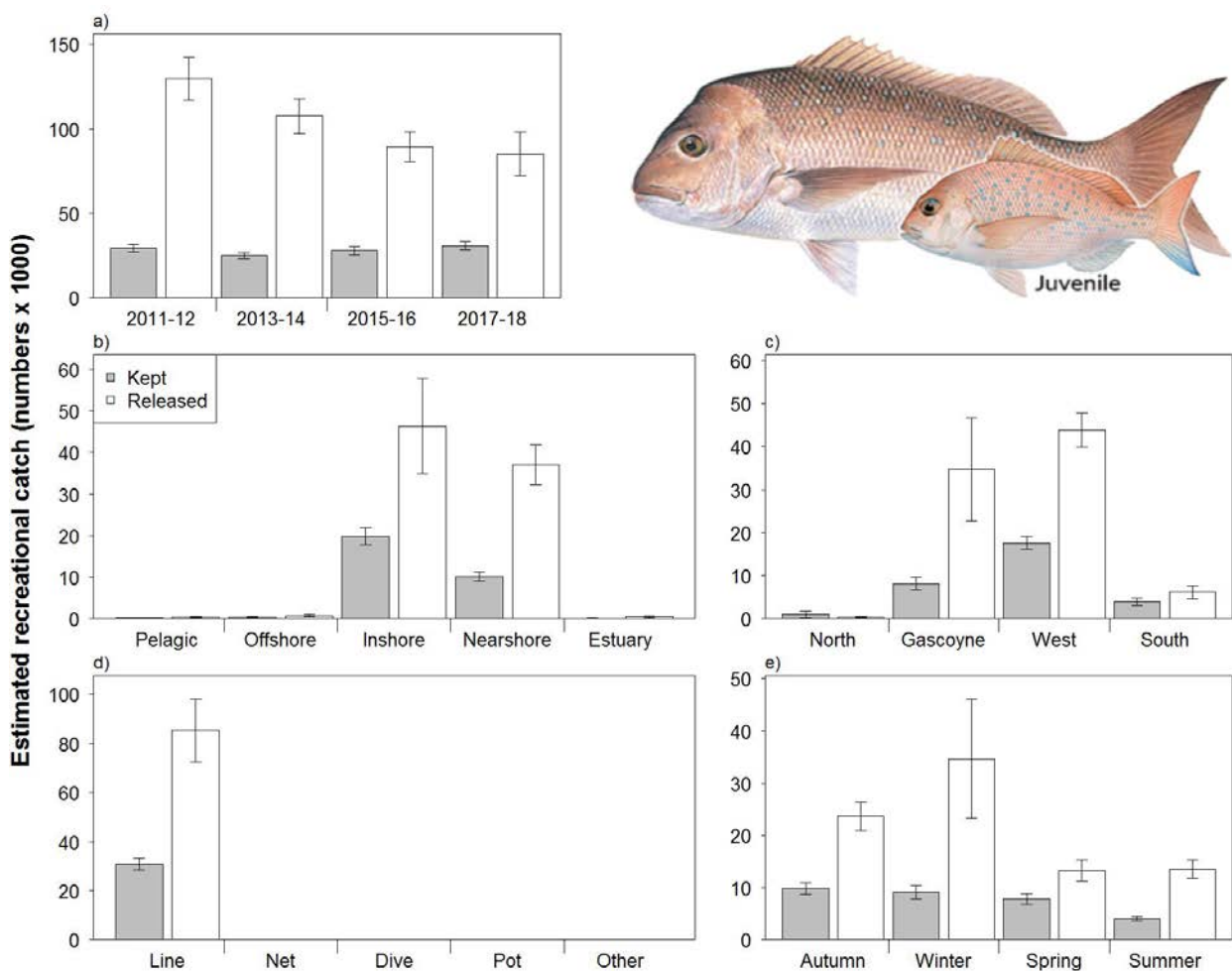


**Figure 50.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of School Whiting in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

## 6.3 Inshore Demersal

### 6.3.1 Pink Snapper (*Chrysophrys auratus*)

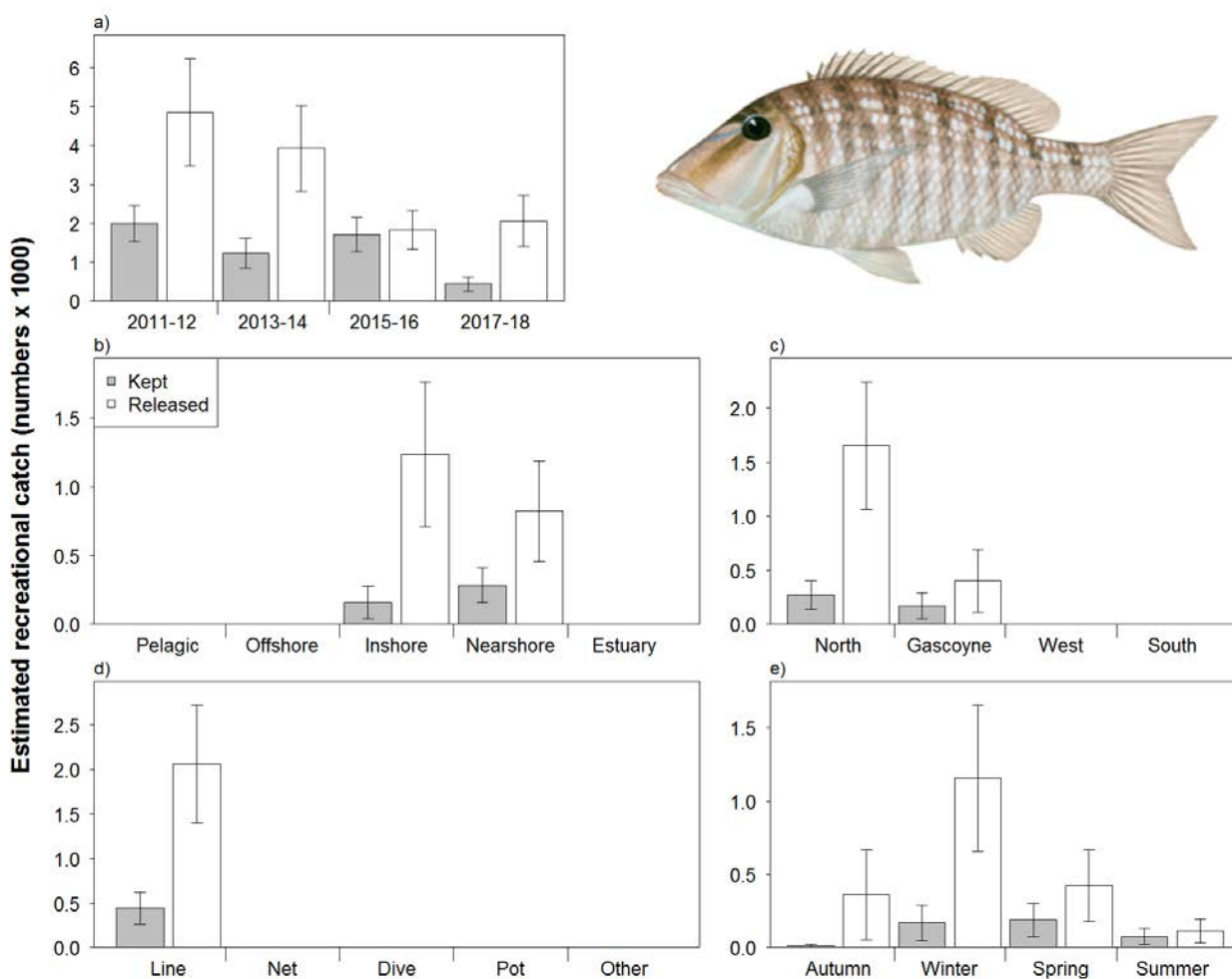
Pink Snapper is an inshore demersal indicator species in the Gascoyne Coast, West Coast and South Coast bioregions. It is also a nearshore indicator species in the Gascoyne Coast bioregion. Most boat-based recreational catches of Pink Snapper occurred in the West Coast and Gascoyne Coast, with some catches in the South Coast and North Coast (Figure 51c). The majority of catches were released (73%; Table 5, Figure 51a) with most releases attributed to “Under Size” (Table 6). Catches were taken predominantly from inshore demersal and nearshore (Figure 51b). All catches were taken by line fishing (Figure 51d). Pink Snapper were harvested throughout the year, with higher catches in autumn and winter compared with spring and summer (Figure 51e). The estimated kept and released recreational catches of Pink Snapper in 2017/18 were similar with previous statewide surveys (Figure 51a).



**Figure 51.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Pink Snapper in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.3.2 Bluespotted Emperor (*Lethrinus punctulatus*)

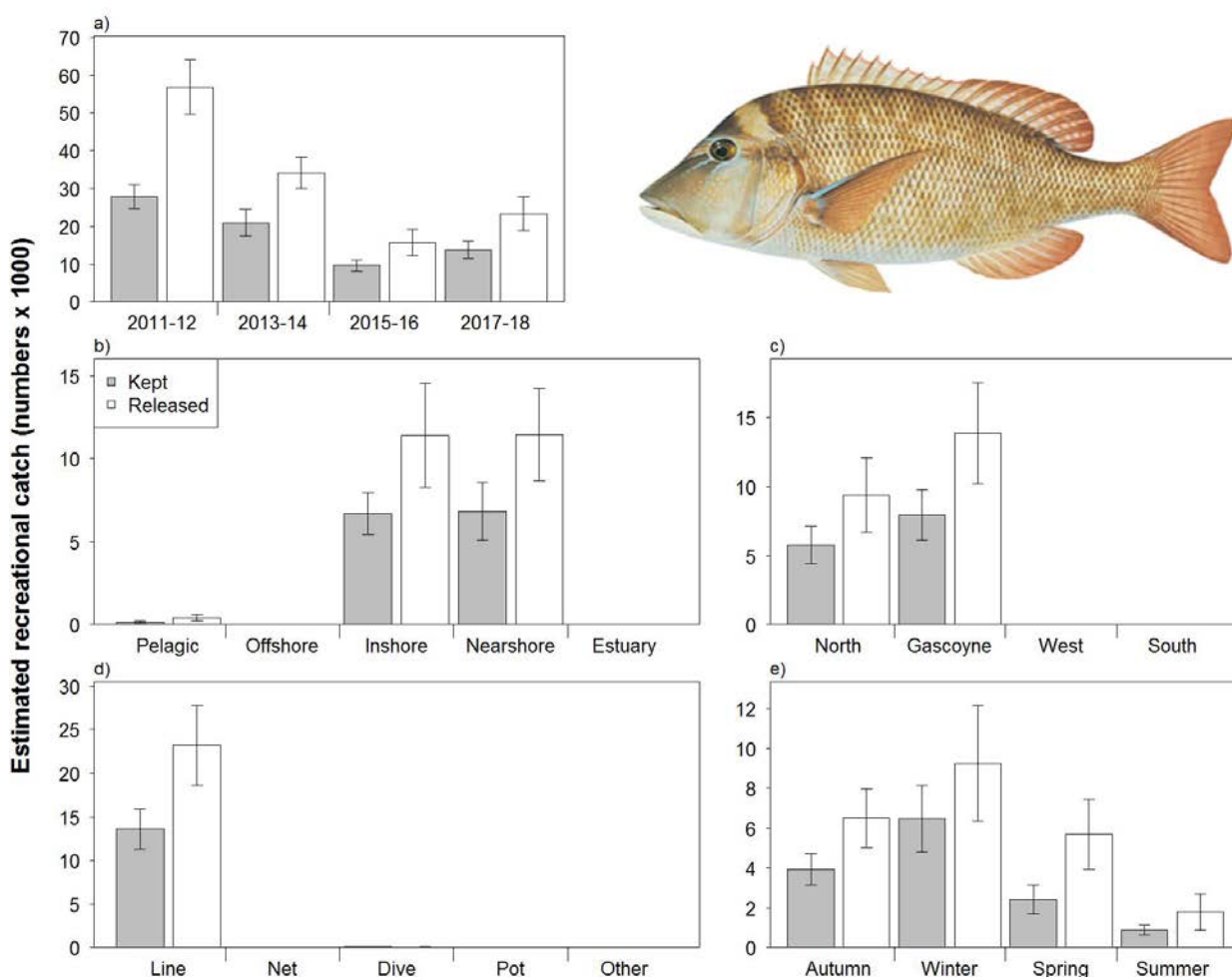
Bluespotted Emperor is an indicator species in the North Coast bioregion. Most boat-based recreational catches of Bluespotted Emperor occurred in the North Coast, followed by the Gascoyne Coast (Figure 52c). The majority of catches were released (82%; Table 4, Figure 52a). Catches were taken from inshore demersal and nearshore (Figure 52b). All catches were taken by line fishing (Figure 52d). Bluespotted Emperor were harvested throughout the year, with higher catches in winter compared with spring, summer and autumn (Figure 52e). The estimated kept recreational catch of Bluespotted Emperor in 2017/18 was lower than previous statewide surveys, however, the catch estimates for this species have high uncertainty (Figure 52a).



**Figure 52.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Bluespotted Emperor in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.3.3 Grass Emperor (*Lethrinus laticaudis*)

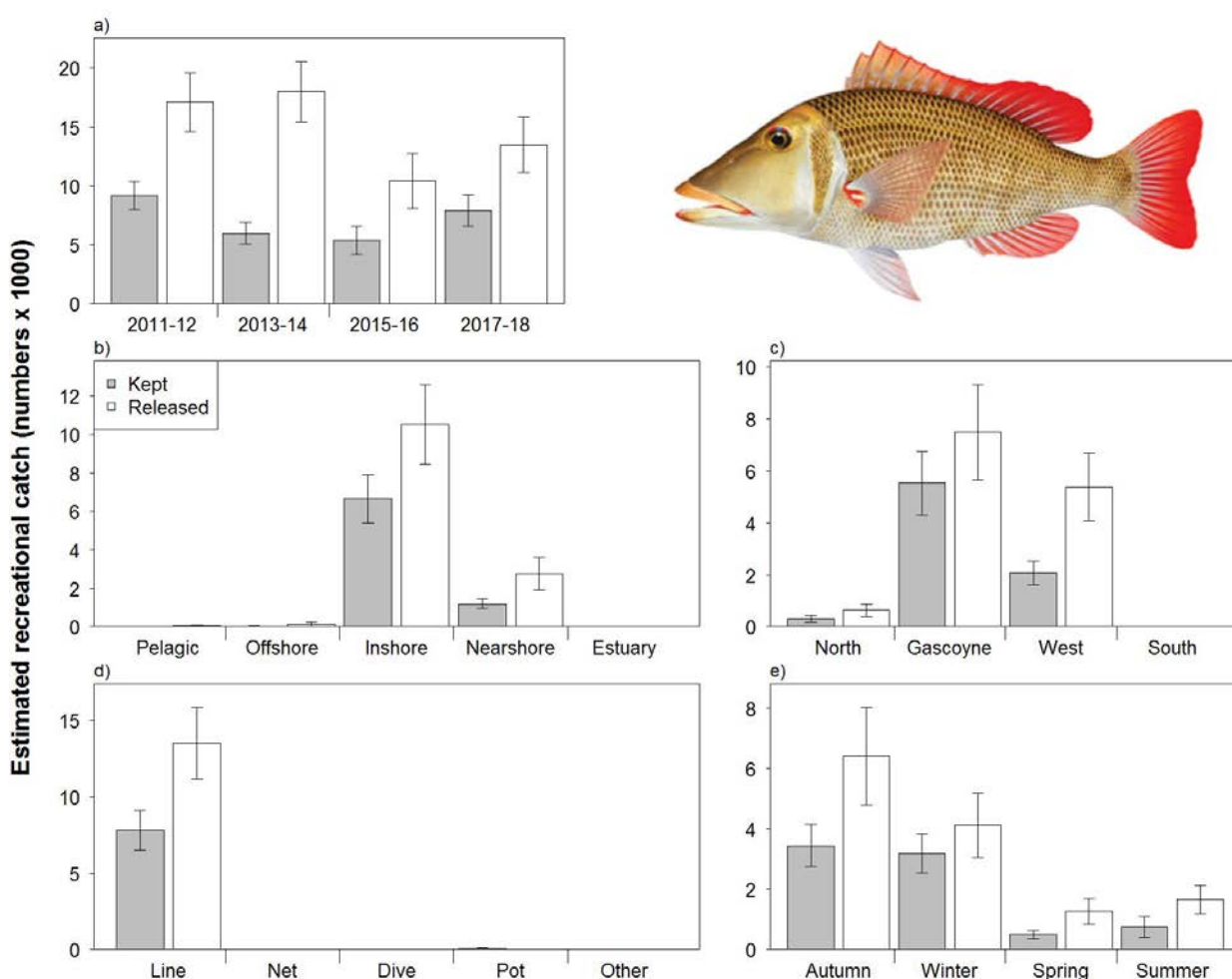
Most boat-based recreational catches of Grass Emperor occurred in the Gascoyne Coast, followed by the North Coast (Figure 53c). The majority of catches were released (63%; Table 5, Figure 53a) with most releases attributed to “Under Size” (Table 6). Catches were taken predominantly from inshore demersal and nearshore (Figure 53b). Most catches were taken by line fishing (Figure 53d). Grass Emperor were harvested throughout the year, with higher catches in autumn and winter compared with spring and summer (Figure 53e). The estimated kept and released recreational catches of Grass Emperor in 2017/18 were similar to 2015/16 (Figure 53a).



**Figure 53.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Grass Emperor in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.3.4 Redthroat Emperor (*Lethrinus miniatus*)

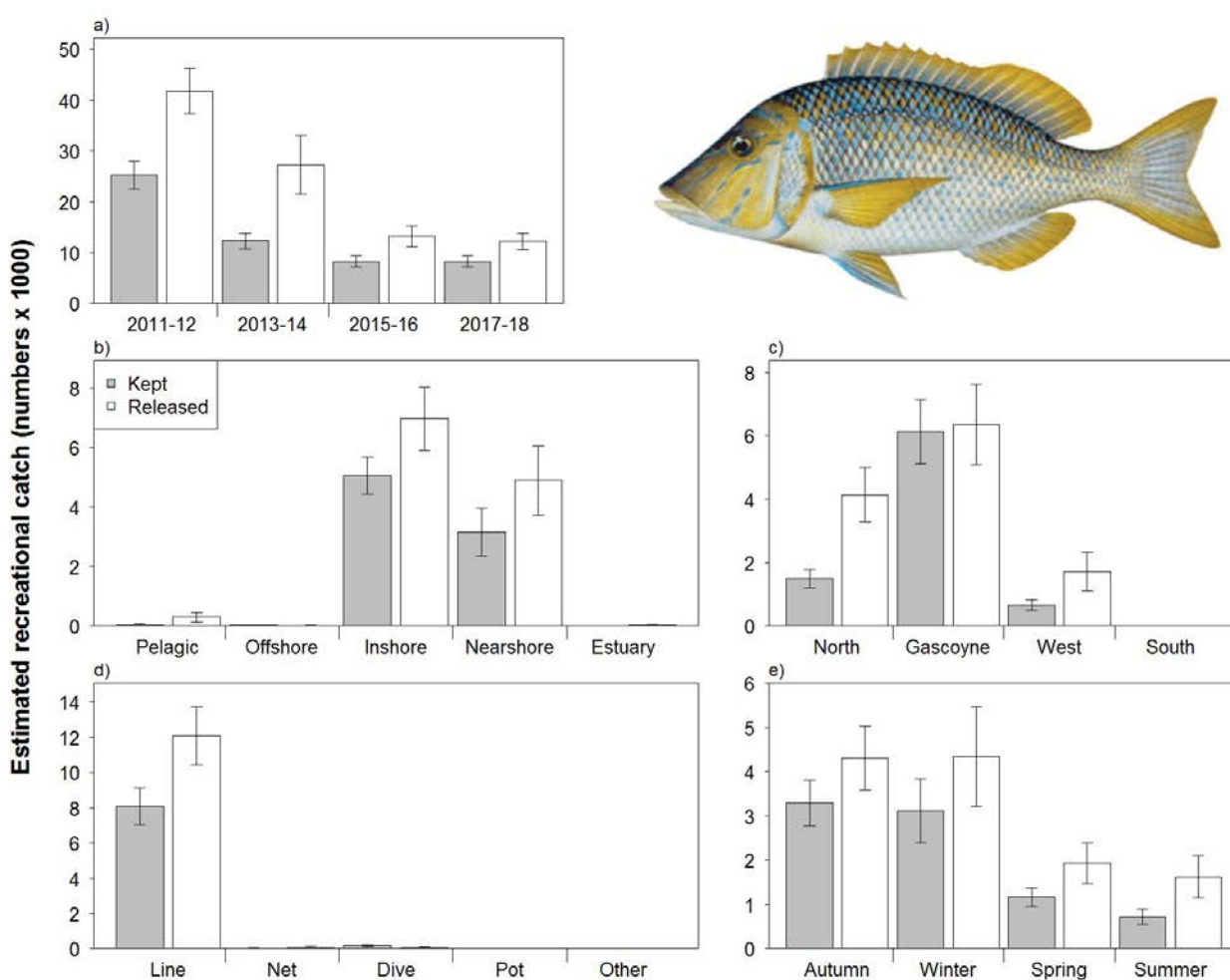
Redthroat Emperor is an indicator in the West Coast bioregion. Most boat-based recreational catches of Redthroat Emperor occurred in the Gascoyne Coast, followed by the West Coast and North Coast (Figure 54c). The majority of catches were released (63%; Table 5, Figure 54a) with most releases attributed to “Under Size” and “Too Small” (Table 6). Catches were taken predominantly from inshore demersal and nearshore (Figure 54b). Catches were mostly taken by line fishing (Figure 54d). Redthroat Emperor were harvested throughout the year, with higher catches in autumn and winter compared with spring and summer (Figure 54e). The estimated kept and released recreational catches of Redthroat Emperor in 2017/18 were similar with previous statewide surveys (Figure 54a).



**Figure 54.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Redthroat Emperor in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.3.5 Spangled Emperor (*Lethrinus nebulosus*)

Spangled Emperor is an indicator species in the Gascoyne Coast bioregion. Most boat-based recreational catches of Spangled Emperor occurred in the Gascoyne Coast, followed by the North Coast and West Coast (Figure 55c). The majority of catches were released (60%; Table 5, Figure 55a) with most releases attributed to “Under Size” (Table 6). Catches were taken predominantly from inshore demersal and nearshore (Figure 55b). Most catches were taken by line fishing (Figure 55d). Spangled Emperor were harvested throughout the year, with higher catches in autumn and winter compared with spring and summer (Figure 55e). The estimated kept recreational catch of Spangled Emperor in 2017/18 was similar to 2015/16 and 2013/14, but lower than 2011/12 (Figure 55a).

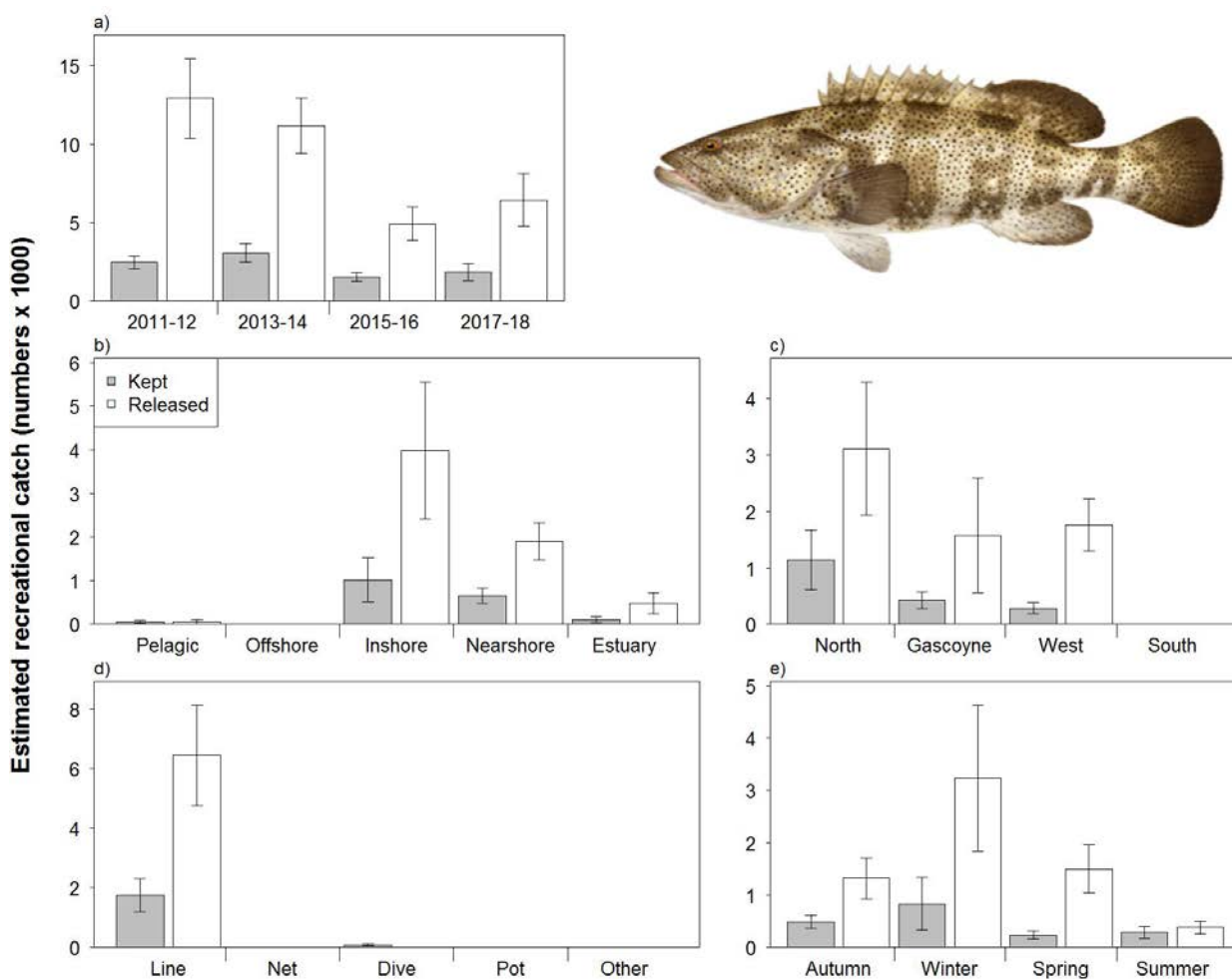


**Figure 55.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Spangled Emperor in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.



### 6.3.6 Blackspotted Rockcod (*Epinephelus malabaricus*)

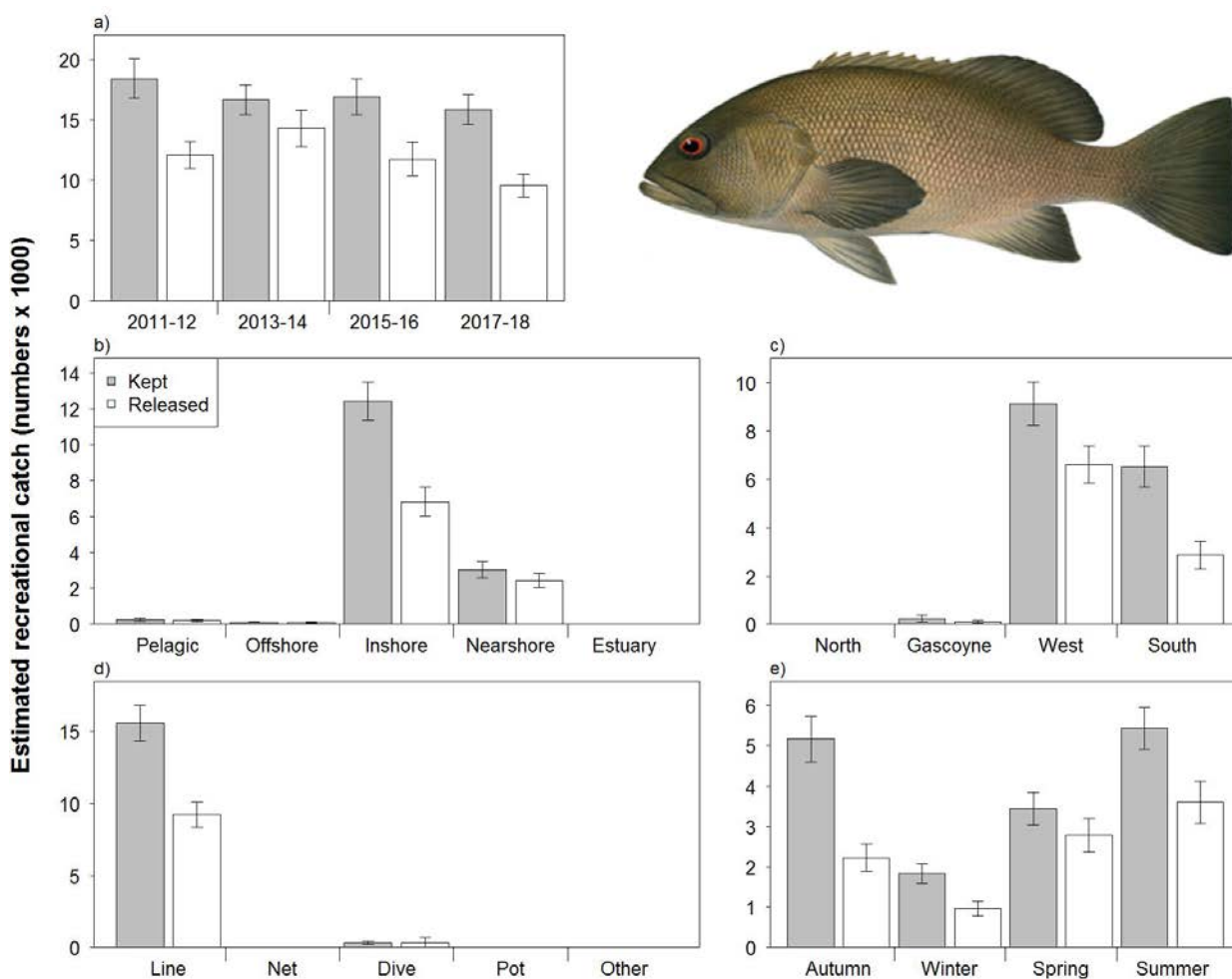
Most boat-based recreational catches of Blackspotted Rockcod occurred in the North Coast, with some catches in the Gascoyne Coast and West Coast (Figure 56c). The majority of catches were released (78%; Table 4, Figure 56a) with most releases attributed to "Under Size" (Table 6). Catches were taken predominantly from inshore demersal and nearshore (Figure 56b). Most catches were taken by line fishing (Figure 56d). Blackspotted Rockcod were harvested throughout the year, with higher catches in winter compared with spring, summer and autumn (Figure 56e). The estimated kept recreational catch of Blackspotted Rockcod in 2017/18 was similar with previous statewide surveys (Figure 56a).



**Figure 56.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Blackspotted Rockcod in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.3.7 Breaksea Cod (*Epinephelides armatus*)

Most boat-based recreational catches of Breaksea Cod occurred in the West Coast, followed by the South Coast and Gascoyne Coast (Figure 57c). The majority of catches were retained (38% released; Table 4, Figure 57a) with most releases attributed to “Under Size” (Table 6). Catches were taken predominantly from inshore demersal and nearshore (Figure 57b). Catches were mostly taken by line fishing (Figure 57d). Breaksea Cod were harvested throughout the year, with higher catches in summer and autumn compared with spring and winter (Figure 57e). The estimated kept and released recreational catches of Breaksea Cod in 2017/18 were similar with previous statewide surveys (Figure 57a).

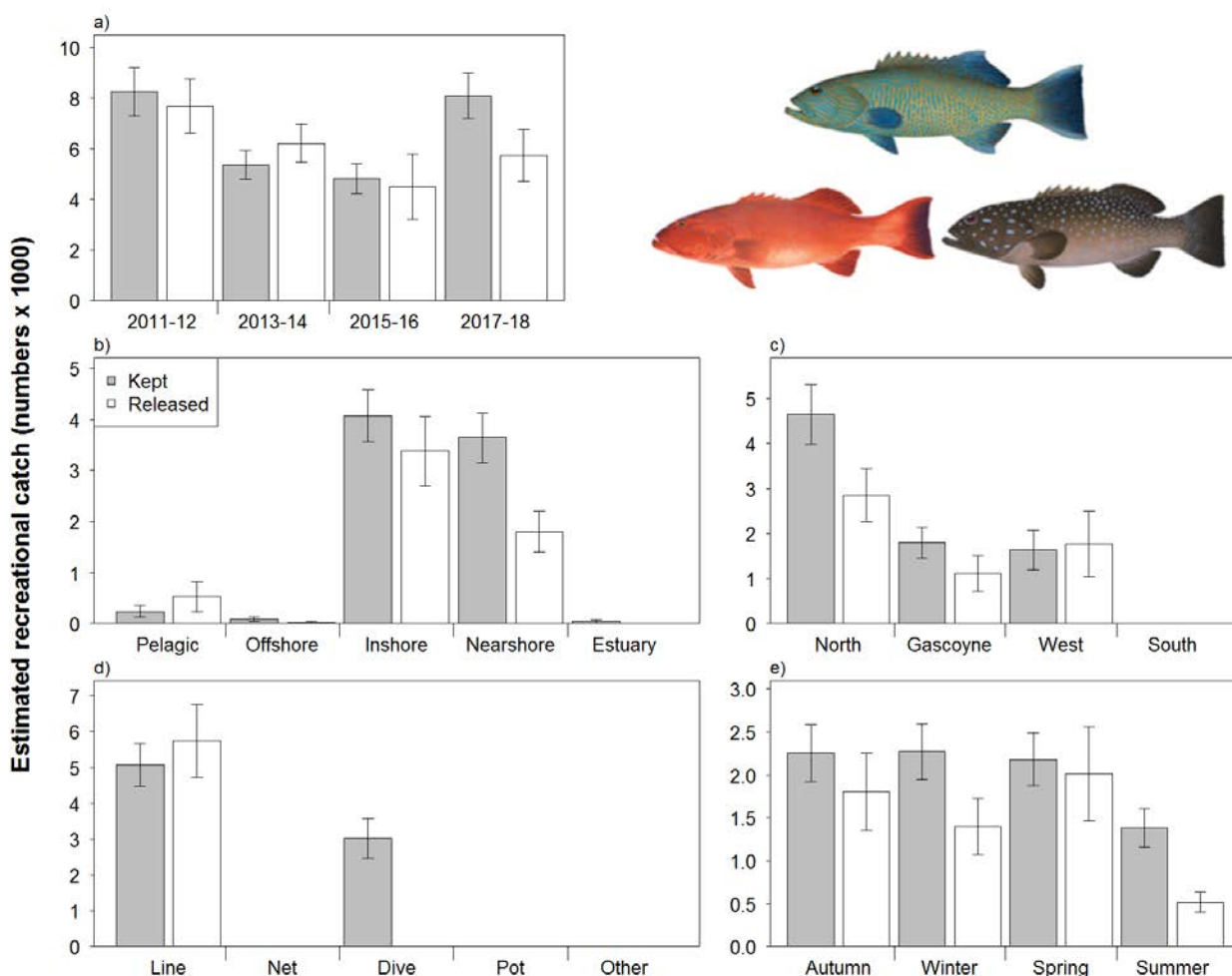


**Figure 57.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Breaksea Cod in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.



### 6.3.8 Coral Trout (*Plectropomus maculatus* and *P. leopardus*)

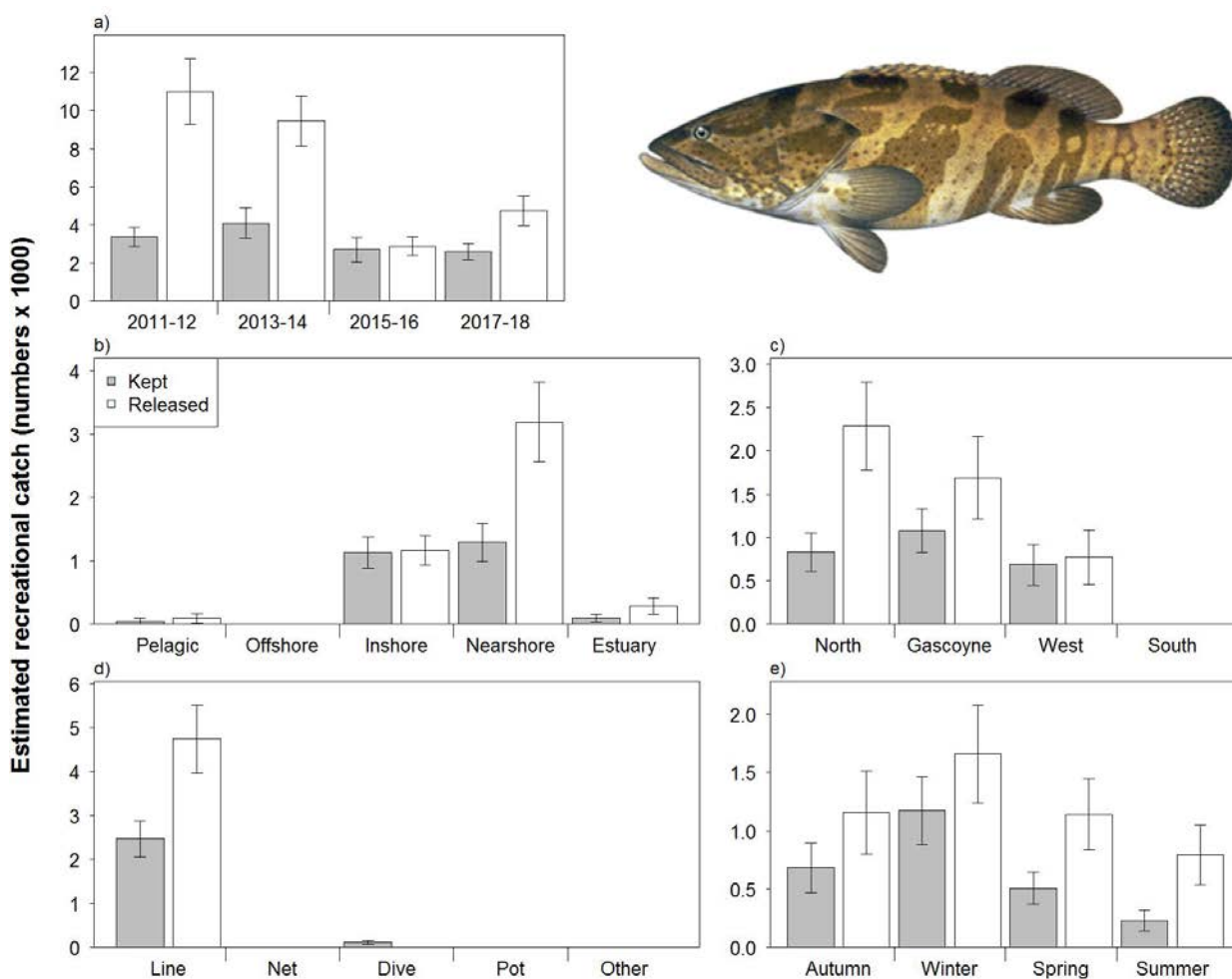
Barcheek Coral Trout is an indicator in the North Coast bioregion. Reporting for this species includes catches for Common Coral Trout (*Plectropomus leopardus*). Most boat-based recreational catches of Barcheek Coral Trout occurred in the North Coast, followed by the Gascoyne Coast and West Coast (Figure 58c). The majority of catches were retained (42% released; Table 4, Figure 58a) with most releases attributed to “Under Size” (Table 6). Catches were taken predominantly from inshore demersal and nearshore (Figure 58b). Catches were mostly taken by line fishing with some fishing from diving (Figure 58d). Coral Trout were harvested throughout the year, with higher catches in autumn, winter and spring compared with summer (Figure 58e). The estimated kept recreational catch of Coral Trout in 2017/18 was higher than 2015/16 and 2013/14, but similar with 2011/12 (Figure 58a).



**Figure 58.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Barcheek Coral Trout in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.3.9 Goldspotted Rockcod (*Epinephelus coioides*)

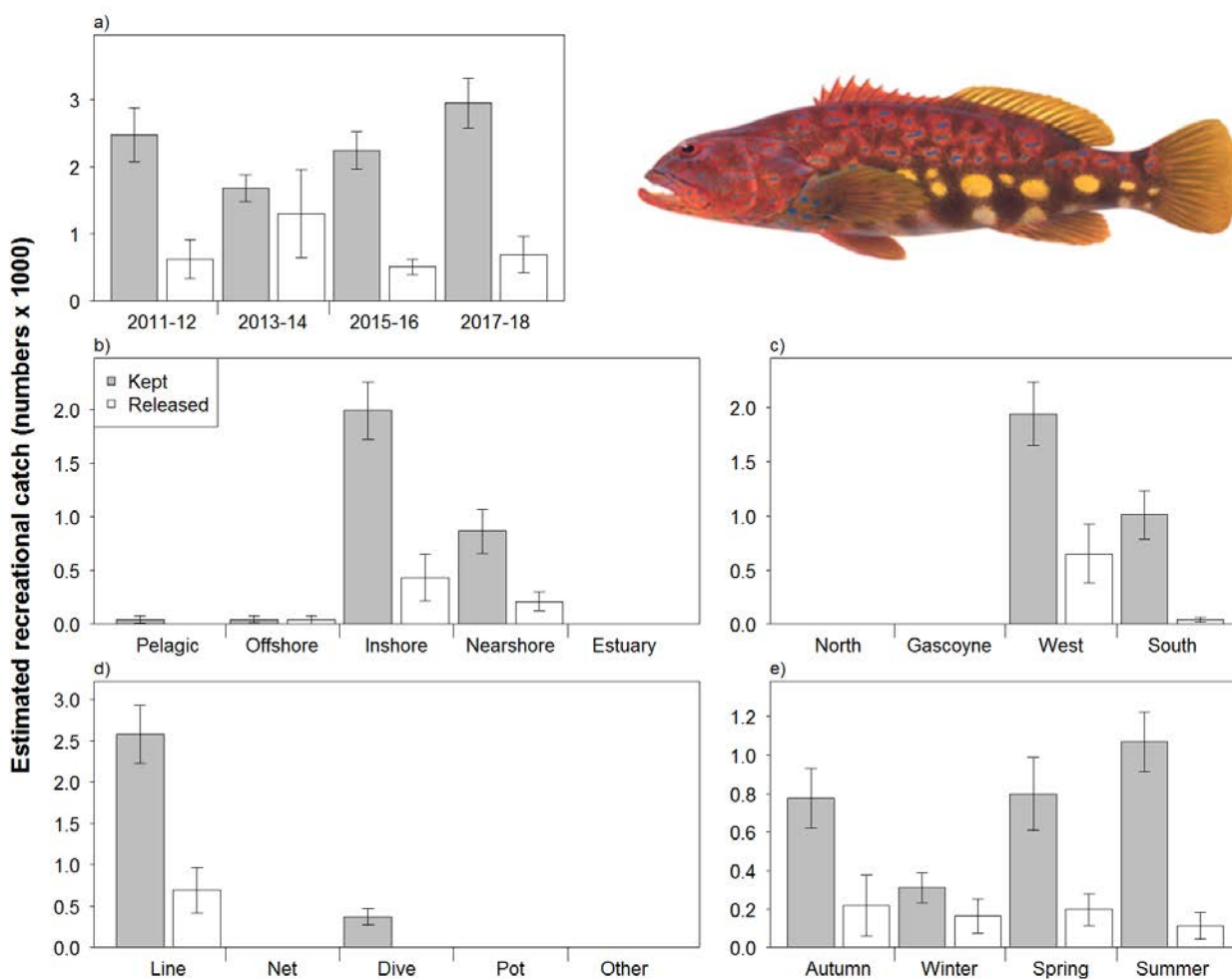
Most boat-based recreational catches of Goldspotted Rockcod occurred in the North Coast, followed by the Gascoyne Coast and West Coast (Figure 59c). The majority of catches were released (65%; Table 4, Figure 59a) with most releases attributed to “Under Size” and “Other” (Table 6). Catches were taken predominantly from nearshore and inshore demersal (Figure 59b). Most catches were taken by line fishing (Figure 59d). Goldspotted Rockcod were harvested throughout the year, with higher catches in autumn and winter compared with spring and summer (Figure 59e). The estimated kept recreational catch of Goldspotted Rockcod in 2017/18 was similar with previous statewide surveys (Figure 59a).



**Figure 59.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Goldspotted Rockcod in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.3.10 Harlequin Fish (*Othos dentex*)

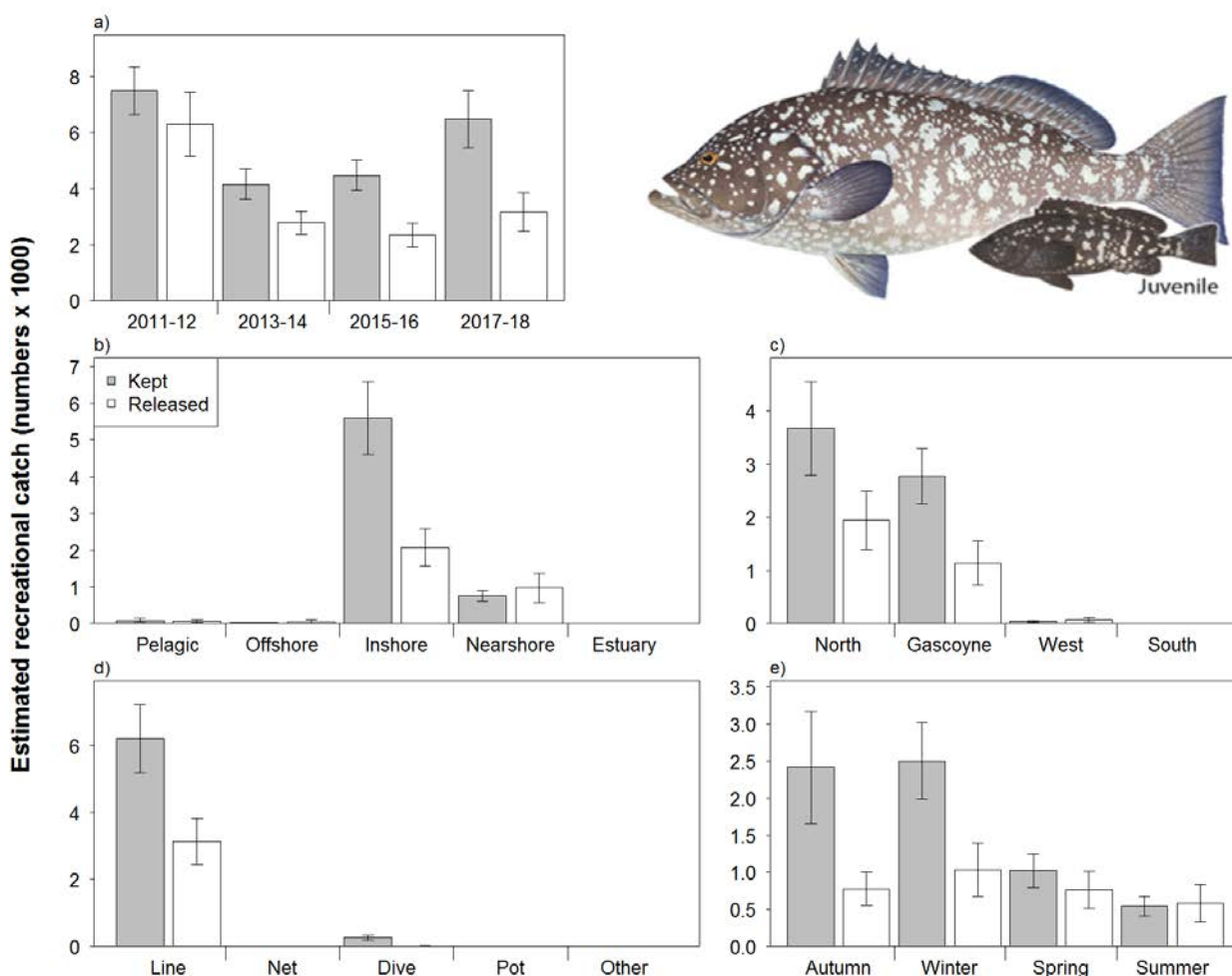
Most boat-based recreational catches of Harlequin Fish occurred in the West Coast, followed by the South Coast (Figure 60c). The majority of catches were retained (19% released; Table 4, Figure 60a) with most releases attributed to “Under Size” and “Over Limit” (Table 6). Catches were taken predominantly from inshore demersal and nearshore (Figure 60b). Catches were mostly taken by line fishing with some fishing from diving (Figure 60d). Harlequin Fish were harvested throughout the year, with higher catches in spring, summer and autumn compared with winter (Figure 60e). The estimated kept and released recreational catches Harlequin Fish in 2017/18 were similar with previous statewide surveys (Figure 60a).



**Figure 60.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Harlequin Fish in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.3.11 Rankin Cod (*Epinephelus multinotatus*)

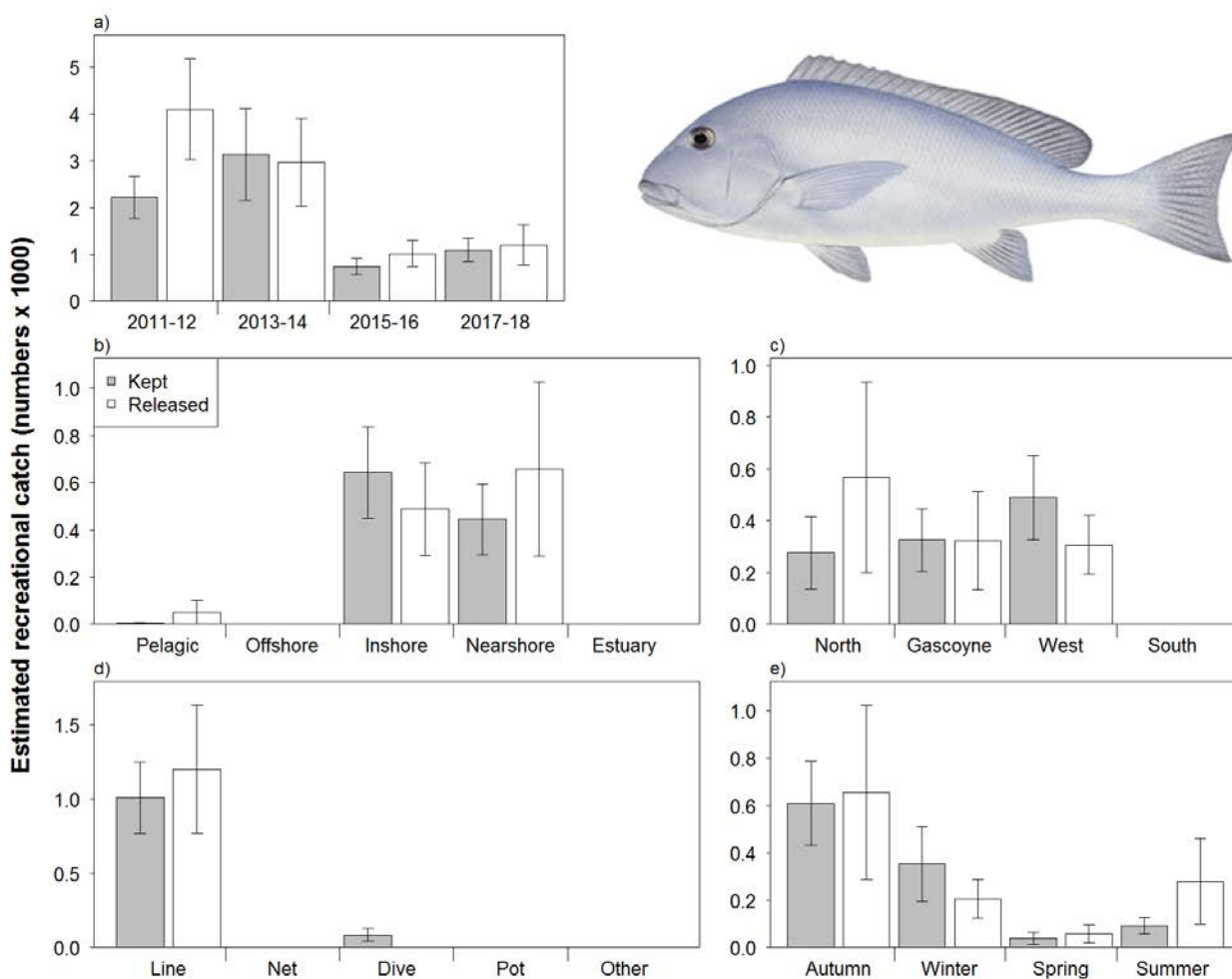
Rankin Cod is an indicator species in the North Coast bioregion. Most boat-based recreational catches of Rankin Cod occurred in the Gascoyne Coast, followed by the North Coast and West Coast (Figure 61c). The majority of catches were retained (33% released; Table 4, Figure 61a) with most releases attributed to “Under Size” and “Too Small” (Table 6). Catches were taken predominantly from inshore demersal and nearshore (Figure 61b). Most catches were taken by line fishing (Figure 61d). Rankin Cod were harvested throughout the year, with higher catches in autumn and winter compared with spring and summer (Figure 61e). The estimated kept recreational catch of Rankin Cod in 2017/18 was similar with previous statewide surveys, while the estimated released recreational catch in 2017/18 was similar to 2015/16 and 2013/14, but lower than 2011/12 (Figure 61a).



**Figure 61.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Rankin Cod in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.3.12 Painted Sweetlips (*Diagramma labiosum*)

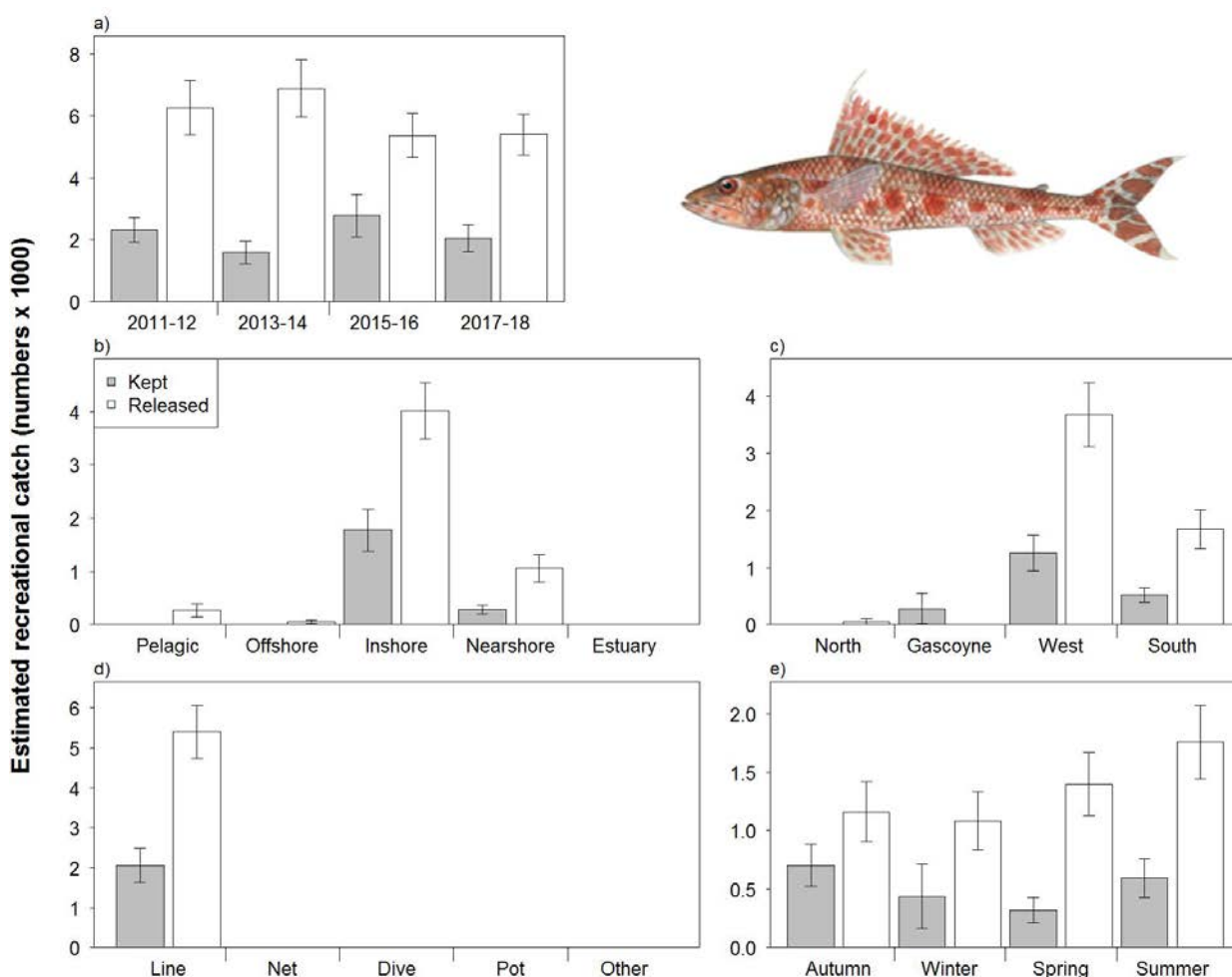
Boat-based recreational catches of Painted Sweetlips occurred in the North Coast, Gascoyne Coast and West Coast (Figure 62c). Similar proportions of the boat-based recreational catch were kept and released (52% released; Table 4, Figure 62a) with most releases attributed to "Other" and "Under Size" (Table 6). Catches were taken predominantly from inshore demersal and nearshore (Figure 62b). Most catches were taken by line fishing (Figure 62d). Painted Sweetlips were mostly harvested in autumn and winter compared with spring and summer (Figure 62e). The estimated kept and released recreational catches of Painted Sweetlips in 2017/18 was similar to 2015/16, but lower than 2013/14 and 2011/12 (Figure 62a).



**Figure 62.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Painted Sweetlips in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.3.13 Sergeant Baker (*Aulopus purpurissatus*)

Most boat-based recreational catches of Sergeant Baker occurred in the West Coast, with some catches in the South Coast and Gascoyne Coast (Figure 63c). The majority of catches were released (72%; Table 4, Figure 63a) with most releases attributed to “Other” and “Too Many” (Table 6). Catches were taken predominantly from inshore demersal and nearshore (Figure 63b).. All catches were taken by line fishing (Figure 63d). Sergeant Baker were harvested throughout the year, with similar catches in each season (Figure 63e). The estimated kept and released recreational catches of Sergeant Baker in 2017/18 were similar with previous statewide surveys (Figure 63a).

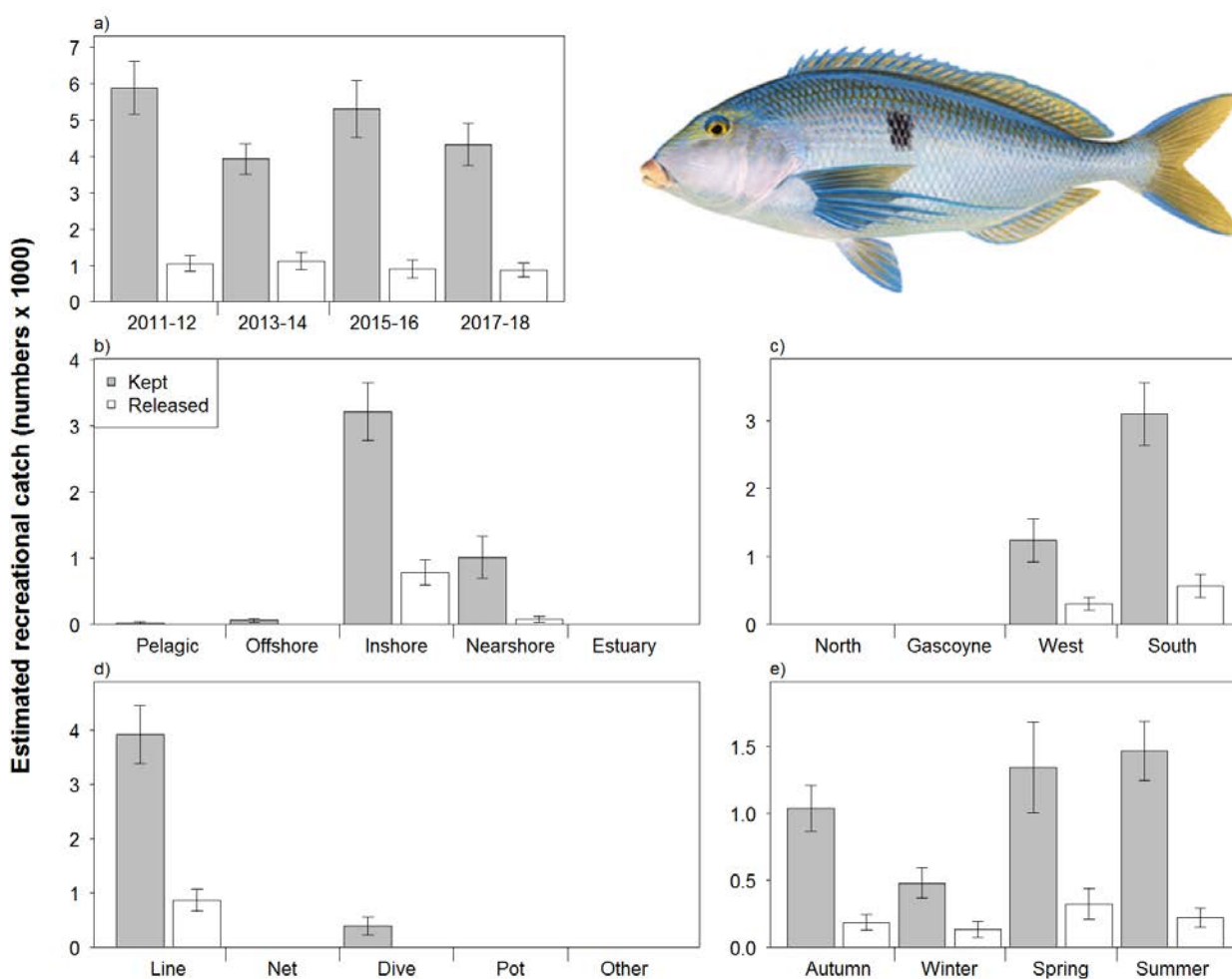


**Figure 63.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Sergeant Baker in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.



### 6.3.14 Blue Morwong (*Nemadactylus valenciennesi*)

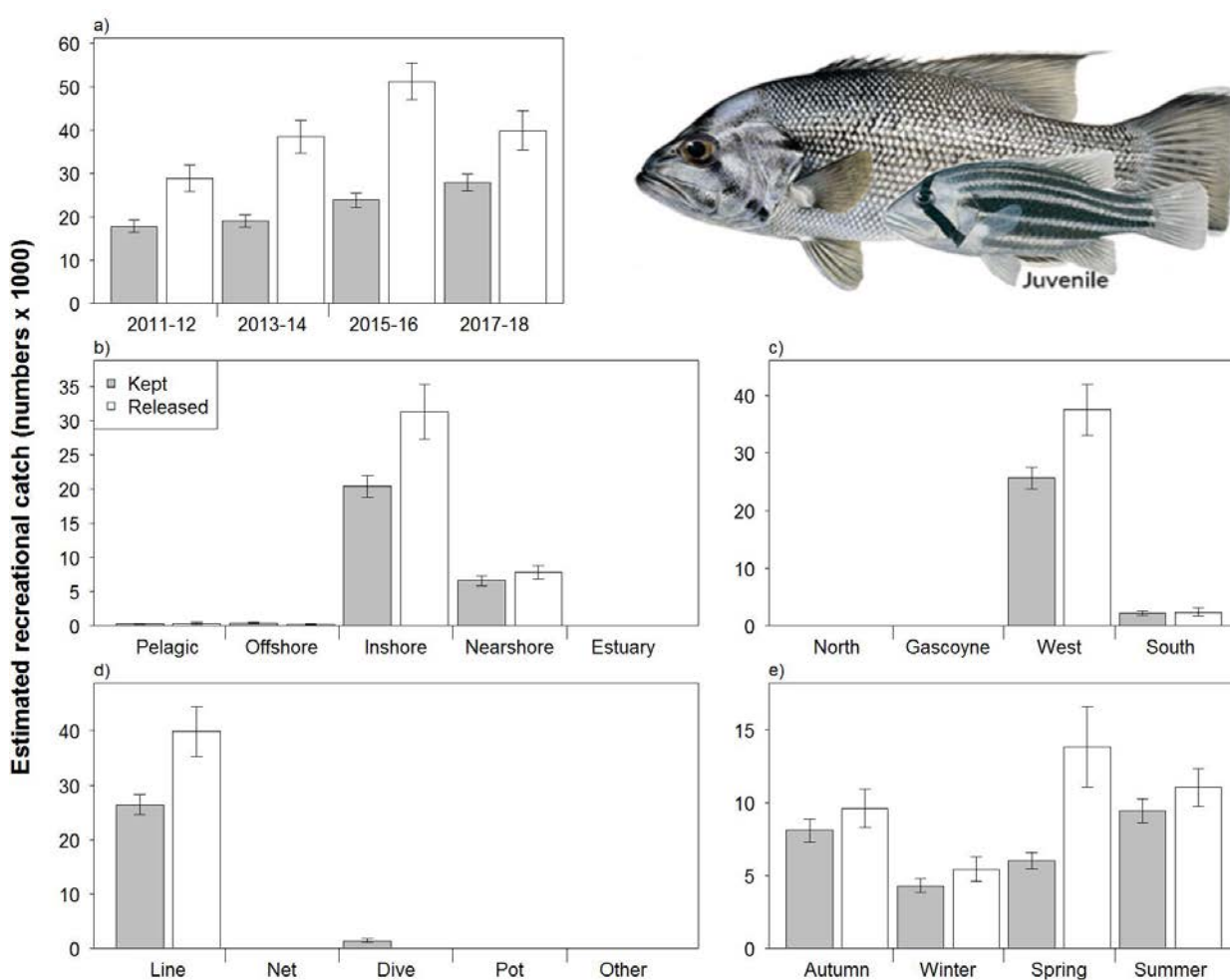
Blue Morwong is an indicator species in the South Coast bioregion. Most boat-based recreational catches of Blue Morwong occurred in the South Coast, followed by the West Coast (Figure 64c). The majority of catches were retained (17% released; Table 4, Figure 64a) with most releases attributed to “Under Size” and “Too Many” (Table 6). Catches were taken predominantly from inshore demersal and nearshore (Figure 64b). Most catches were taken by line fishing with some fishing from diving (Figure 64d). Blue Morwong were harvested throughout the year, with higher catches spring, summer and autumn compared with winter (Figure 64e). The estimated kept and released recreational catches of Blue Morwong were similar in 2017/18 compared with previous statewide surveys (Figure 64a).



**Figure 64.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Blue Morwong in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.3.15 West Australian Dhufish (*Glaucosoma hebraicum*)

West Australian Dhufish is an indicator species in the West Coast bioregion. Most boat-based recreational catches of West Australian Dhufish occurred in the West Coast, with some catches in the South Coast (Figure 65c). The majority of catches were released (59%; Table 5, Figure 65a) with most releases attributed to “Under Size” (Table 6). Catches were taken predominantly from inshore demersal and nearshore (Figure 65b). Catches were mostly taken by line fishing (Figure 65d). West Australian Dhufish were harvested throughout the year, with higher catches in summer and autumn compared with winter and spring (Figure 65e). The estimated kept recreational catch of West Australian Dhufish in 2017/18 was higher than 2015/16, while the estimated released recreational catch in 2017/18 was lower than 2015/16 (Figure 65a).

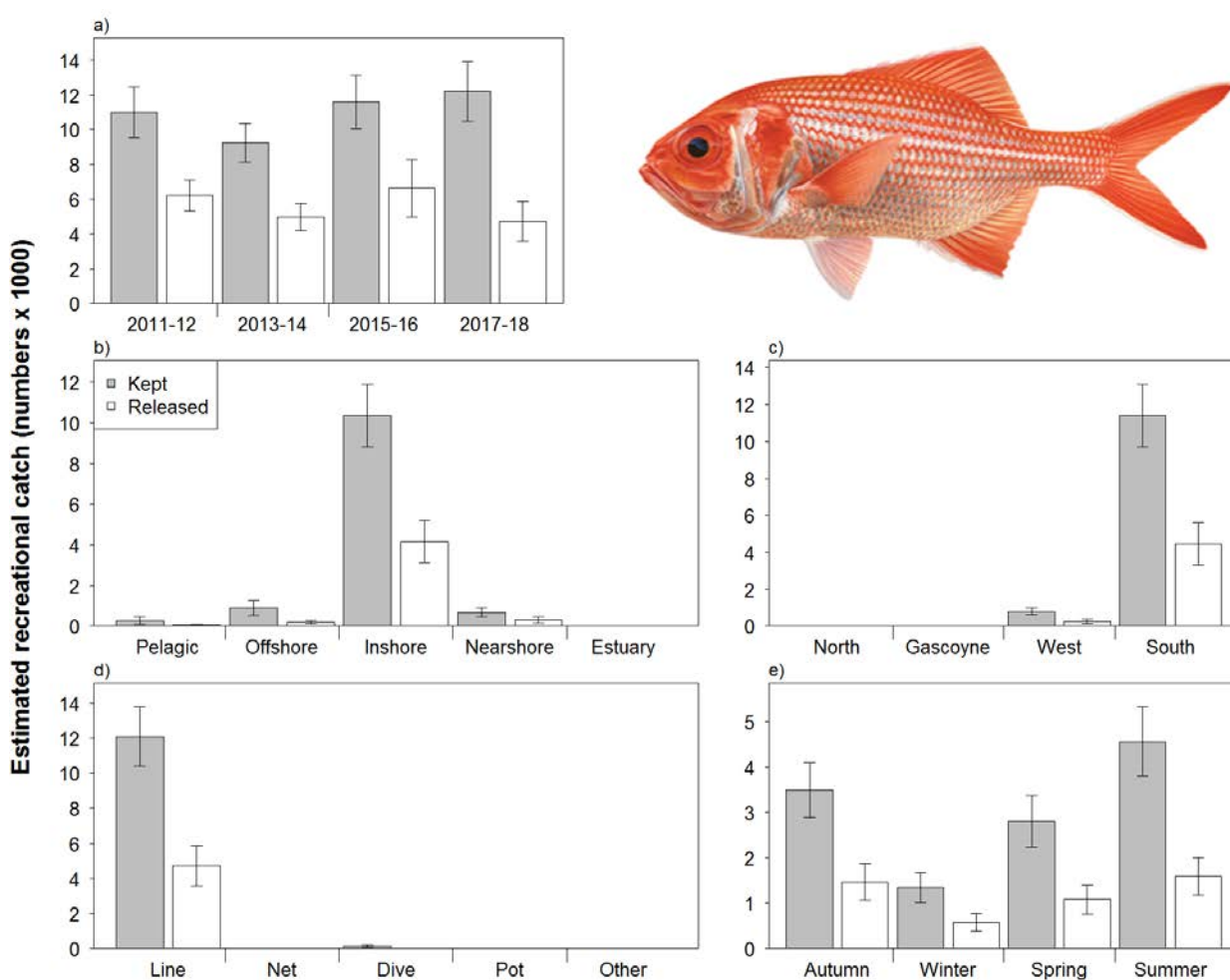


**Figure 65.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of West Australian Dhufish in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.



### 6.3.16 Bight Redfish (*Centroberyx gerrardi*)

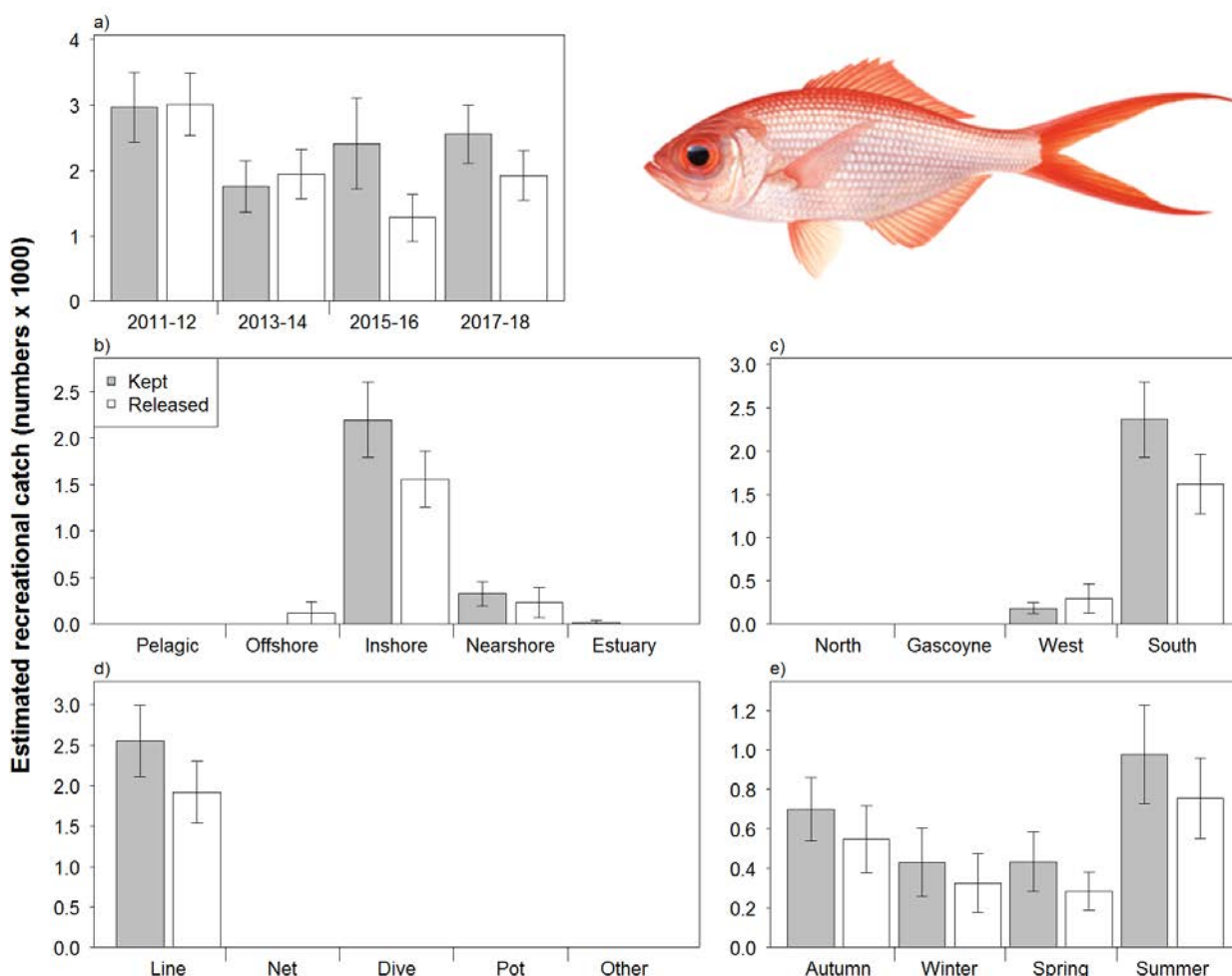
Bight Redfish is an indicator species in the West and South Coast bioregions. Most boat-based recreational catches of Bight Redfish occurred in the South Coast, with some catches in the West Coast (Figure 66c). The majority of catches were retained (28% released; Table 4, Figure 66a) with most releases attributed to “Too Small” and “Under Size” (Table 6). Catches were taken predominantly from inshore demersal (Figure 66b). Most catches were taken by line fishing (Figure 66d). Bight Redfish were harvested throughout the year, with higher catches in spring, summer and autumn compared with winter (Figure 66e). The estimated kept and released recreational catches of Bight Redfish in 2017/18 were similar with previous statewide surveys (Figure 66a).



**Figure 66.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Bight Redfish in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.3.17 Swallowtail (*Centroberyx lineatus*)

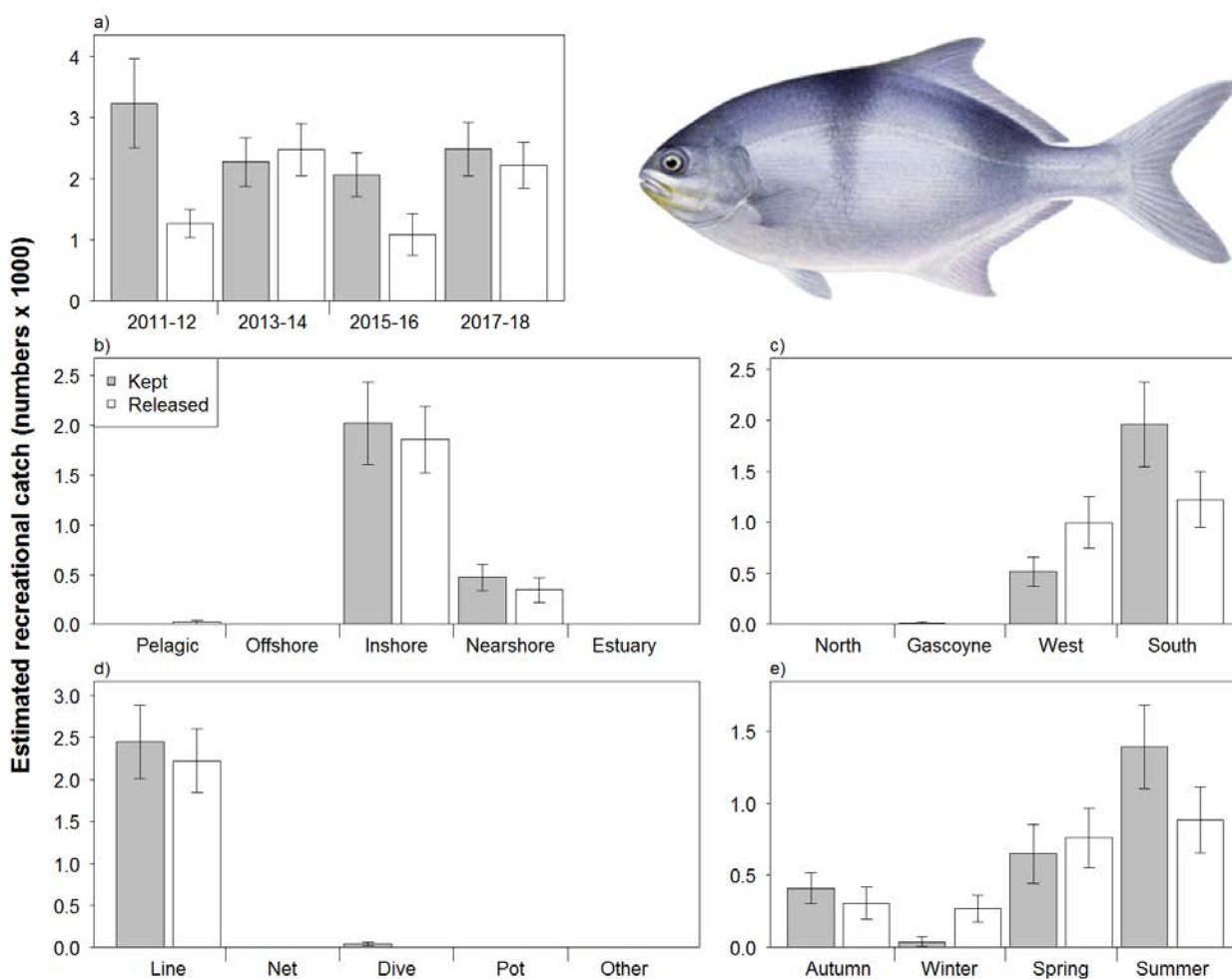
Most boat-based recreational catches of Swallowtail occurred in the South Coast, with some catches in the West Coast (Figure 67c). The majority of catches were retained (43% released; Table 4, Figure 67a) with most releases attributed to "Too Many" and "Under Size" (Table 6). Catches were taken predominantly from inshore demersal (Figure 67b). All catches were taken by line fishing (Figure 67d). Swallowtail were harvested throughout the year, with highest catches in summer, followed by autumn, winter and spring (Figure 67e). The estimated kept and released recreational catches of Swallowtail in 2017/18 were similar with previous statewide surveys (Figure 67a).



**Figure 67.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Swallowtail in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.3.18 Sea Sweep (*Scorpiis aequipinnis*)

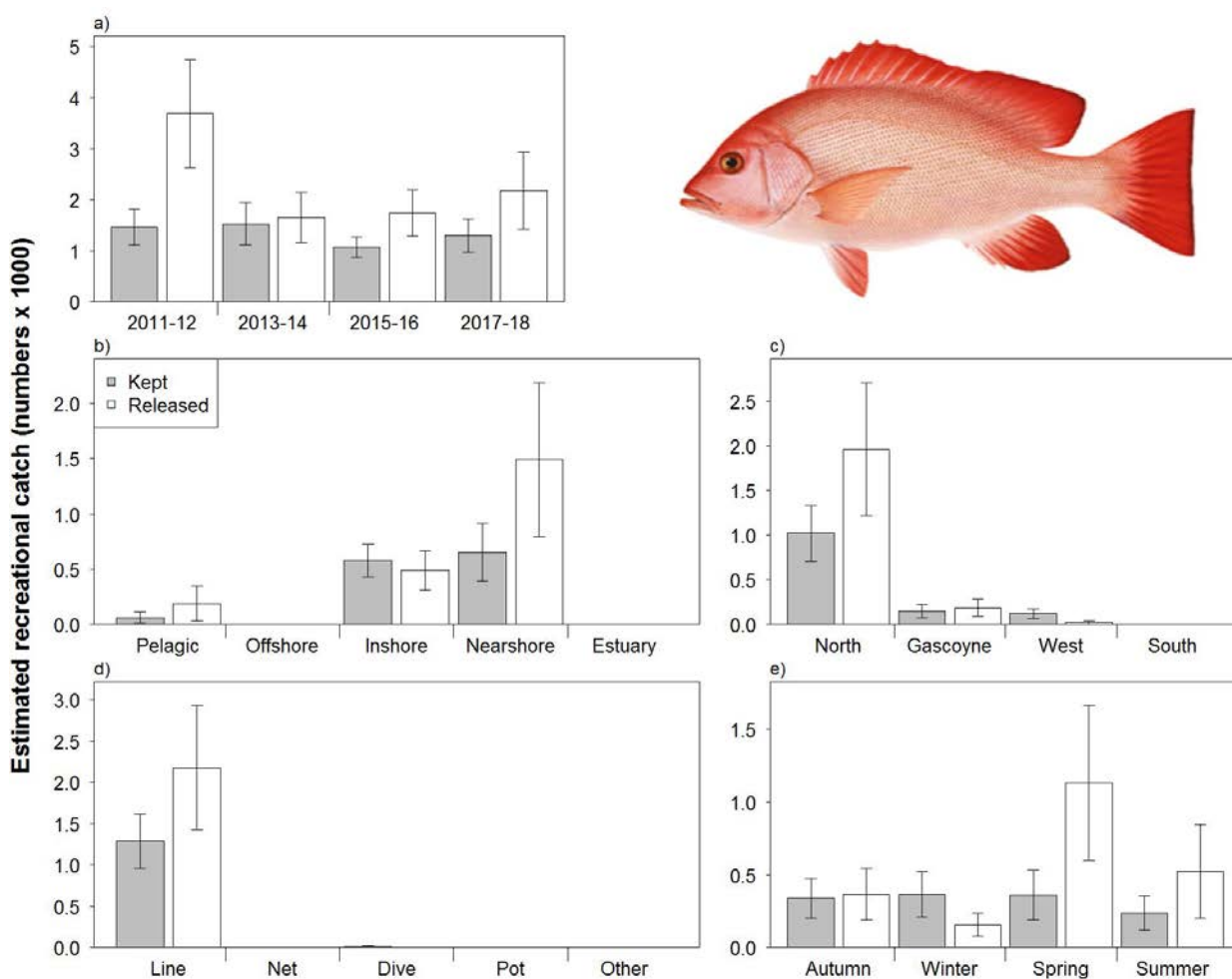
Most boat-based recreational catches of Sea Sweep occurred in the South Coast, with some catches in the West Coast (Figure 68c). Similar proportions of the boat-based recreational catch were kept and released (47% released; Table 4, Figure 68a) with most releases attributed to "Too Many" (Table 6). Catches were taken predominantly from inshore demersal (Figure 68b). Most catches were taken by line fishing (Figure 68d). Sea Sweep were harvested throughout the year, with highest catches in summer, followed by spring, autumn and winter (Figure 68e). The estimated kept recreational catch of Sea Sweep in 2017/18 was similar with previous statewide surveys (Figure 68a).



**Figure 68.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Sea Sweep in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.3.19 Crimson Snapper (*Lutjanus erythropterus*)

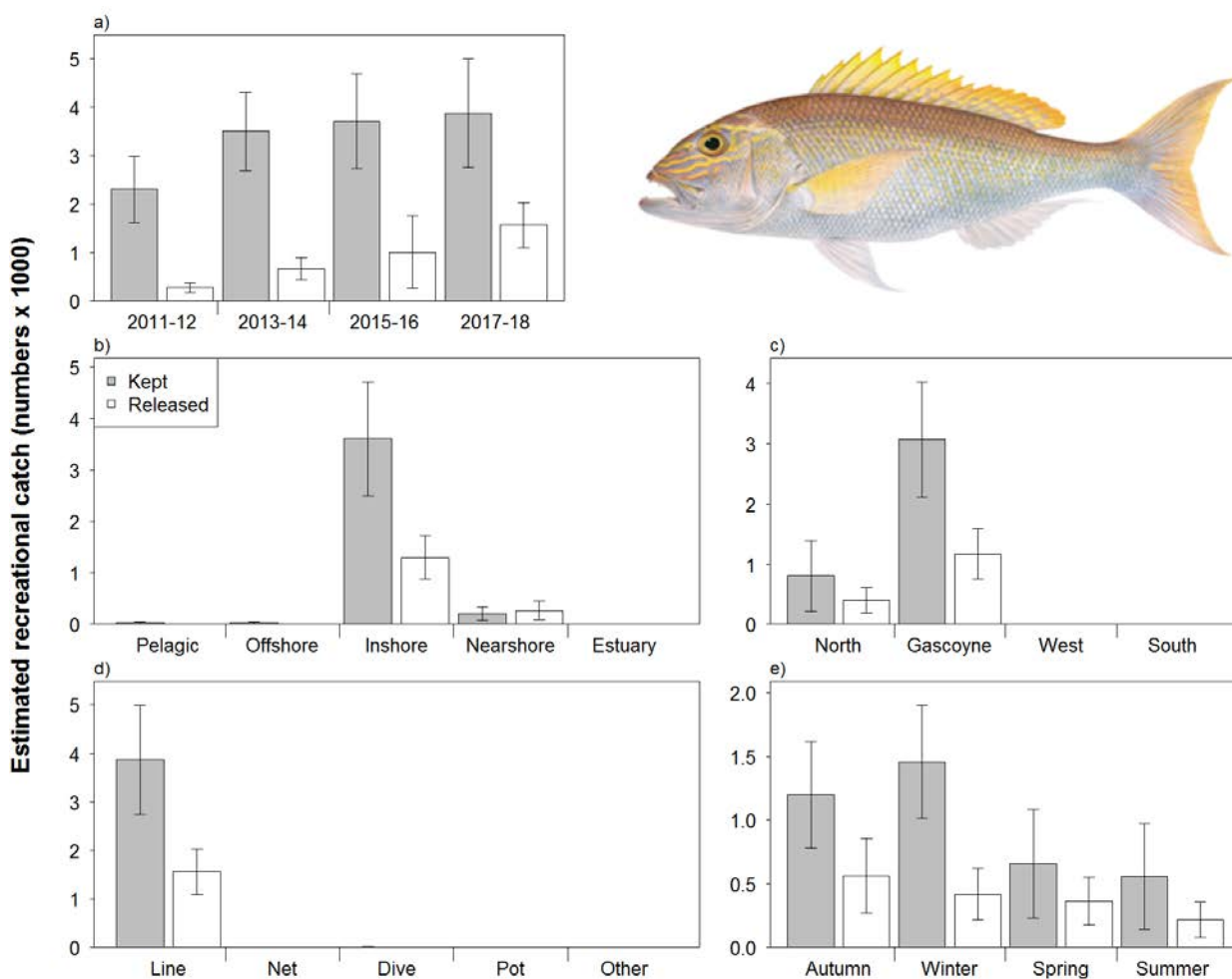
Most boat-based recreational catches of Crimson Snapper occurred in the North Coast, with some catches in the Gascoyne Coast and West Coast (Figure 69c). The majority of catches were released (63%; Table 4, Figure 69a) with most releases attributed to "Under Size" and "Over Limit" (Table 6). Catches were taken predominantly from nearshore and inshore demersal (Figure 69b). Most catches were taken by line fishing (Figure 69d). Crimson Snapper were harvested throughout the year (Figure 69e). The estimated kept recreational catch of Crimson Snapper in 2017/18 was similar with previous statewide surveys (Figure 69a).



**Figure 69.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Crimson Snapper in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.3.20 Goldband Snapper (*Pristipomoides multidens*)

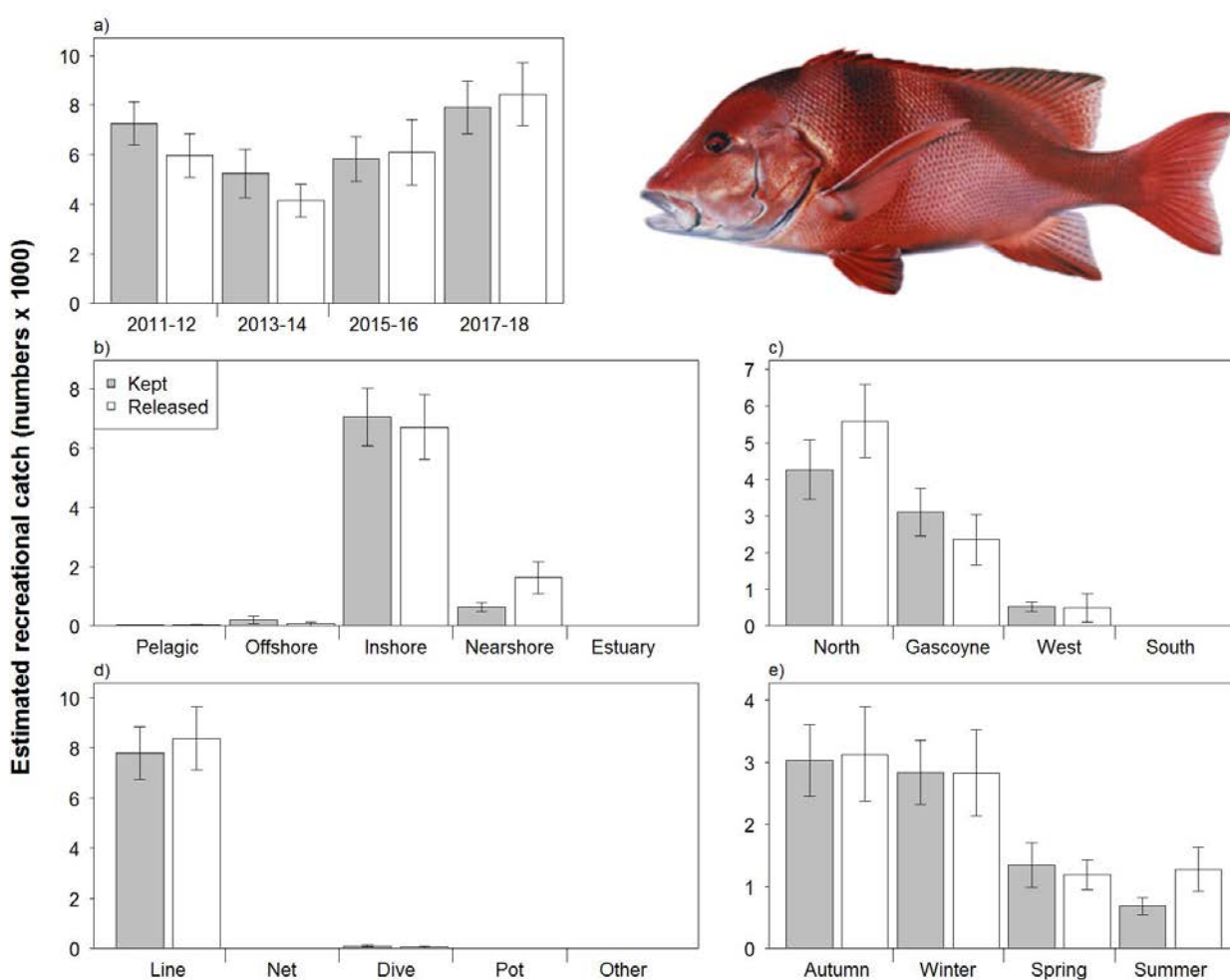
Goldband Snapper is an indicator species in the North Coast and Gascoyne Coast bioregions. Most boat-based recreational catches of Goldband Snapper occurred in the Gascoyne Coast, with some catches in the North Coast (Figure 70c). The majority of catches were retained (29% released; Table 5, Figure 70a) with most releases attributed to “Under Size” and “Other” (Table 6). Catches were taken predominantly from inshore demersal (Figure 70b). All catches were taken by line fishing (Figure 70d). Goldband Snapper were harvested mostly in autumn and winter compared with spring and summer (Figure 70e). The estimated kept recreational catch of Goldband Snapper in 2017/18 was similar with previous statewide surveys (Figure 70a).



**Figure 70.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Goldband Snapper in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.3.21 Red Emperor (*Lutjanus sebae*)

Red Emperor is an indicator species in the Gascoyne Coast and North Coast bioregions. Most boat-based recreational catches of Red Emperor occurred in the North Coast, followed by the Gascoyne Coast and West Coast (Figure 71c). Similar proportions of the boat-based recreational catch were kept and released (52% released; Table 4, Figure 71a) with most releases attributed to “Under Size” (Table 6). Catches were taken predominantly from inshore demersal (Figure 71b). Most catches were taken by line fishing (Figure 71d). Red Emperor were harvested throughout the year, with higher catches in autumn and winter compared with spring and summer (Figure 71e). The estimated kept and released recreational catches of Red Emperor in 2017/18 were similar with previous statewide surveys (Figure 71a).

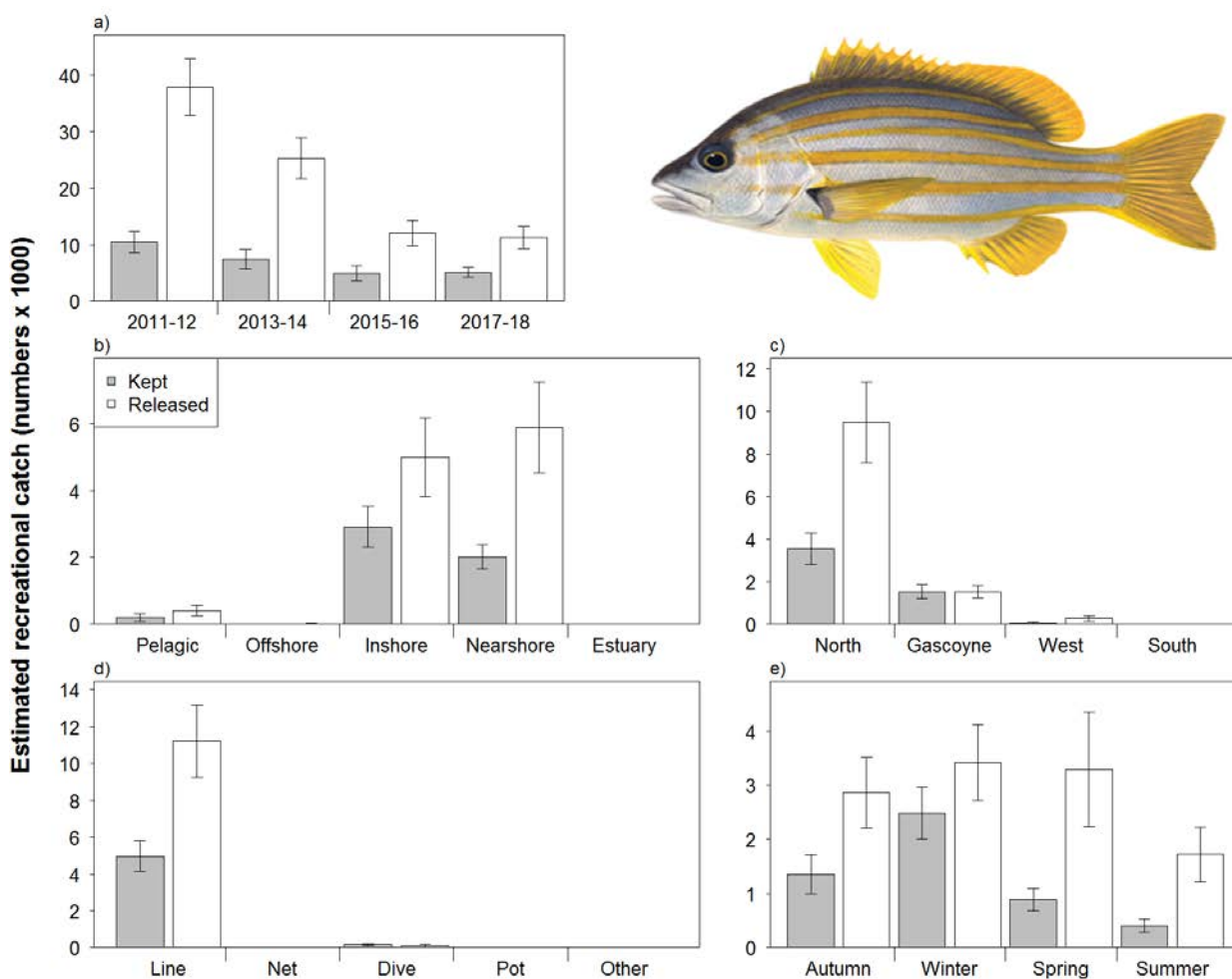


**Figure 71.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Red Emperor in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.



### 6.3.22 Stripey Snapper (*Lutjanus carponotatus*)

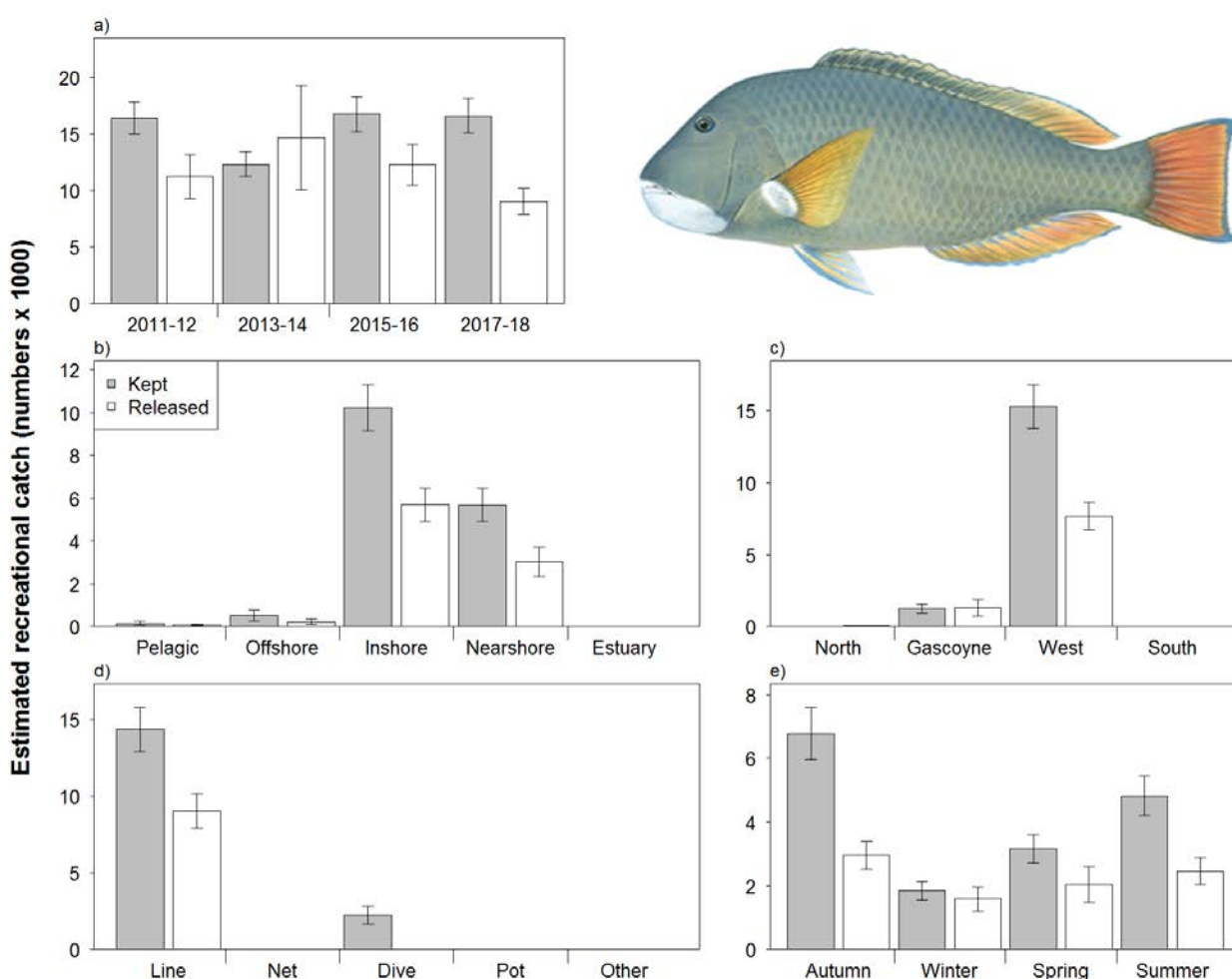
Most boat-based recreational catches of Stripey Snapper occurred in the North Coast, followed by the Gascoyne Coast (Figure 72c). The majority of catches were released (69%; Table 5, Figure 72a) with most releases attributed to “Under Size” (Table 6). Catches were taken predominantly from inshore demersal and nearshore (Figure 72b). Most catches were taken by line fishing (Figure 72d). Stripey Snapper were harvested throughout the year, with higher catches in winter, followed by autumn, spring and summer (Figure 72e). The estimated kept recreational catch of Stripey Snapper in 2017/18 was similar with previous statewide surveys (Figure 72a). The estimated released catch in 2017/18 was similar to 2015/16, but lower than 2013/14 and 2011/12.



**Figure 72.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Stripey Snapper in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.3.23 Baldchin Groper (*Choerodon rubescens*)

Baldchin Groper is an indicator species in the West Coast bioregion. Most boat-based recreational catches of Baldchin Groper occurred in the West Coast, with some catches in the Gascoyne Coast (Figure 73c). The majority of catches were retained (35% released; Table 4, Figure 73a) with most releases attributed to “Under Size” (Table 6). Catches were taken predominantly from inshore demersal and nearshore (Figure 73b). Most catches were taken by line fishing (Figure 73d). Baldchin Groper were harvested throughout the year, with higher catches in summer and autumn compared with winter and spring (Figure 73e). The estimated kept recreational catch of Baldchin Groper in 2017/18 was similar with previous statewide surveys, while the estimated released recreational catch in 2017/18 was lower than 2015/16 (Figure 73a).

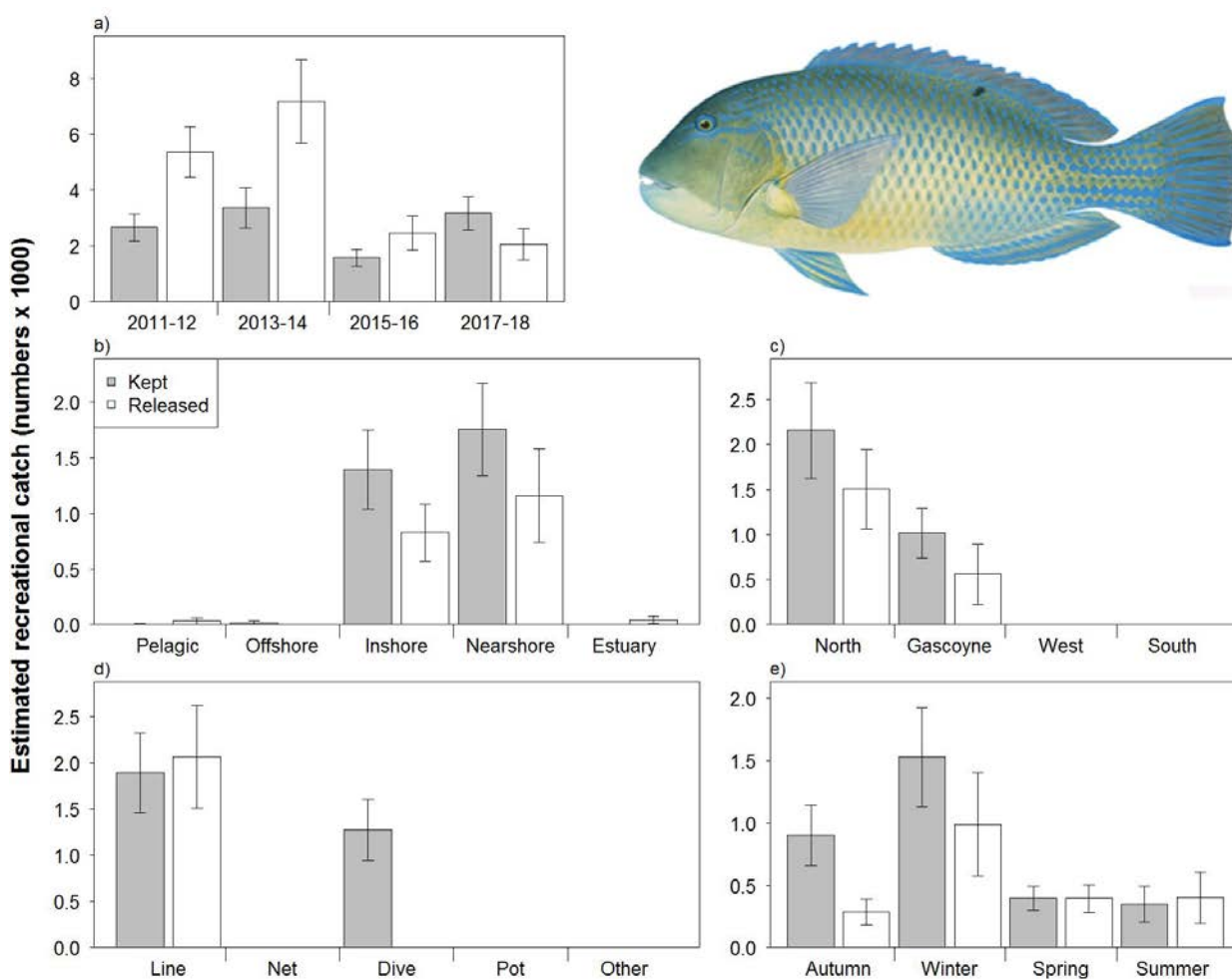


**Figure 73.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Baldchin Groper in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.



### 6.3.24 Blackspot Tuskfish (*Choerodon schoenleinii*)

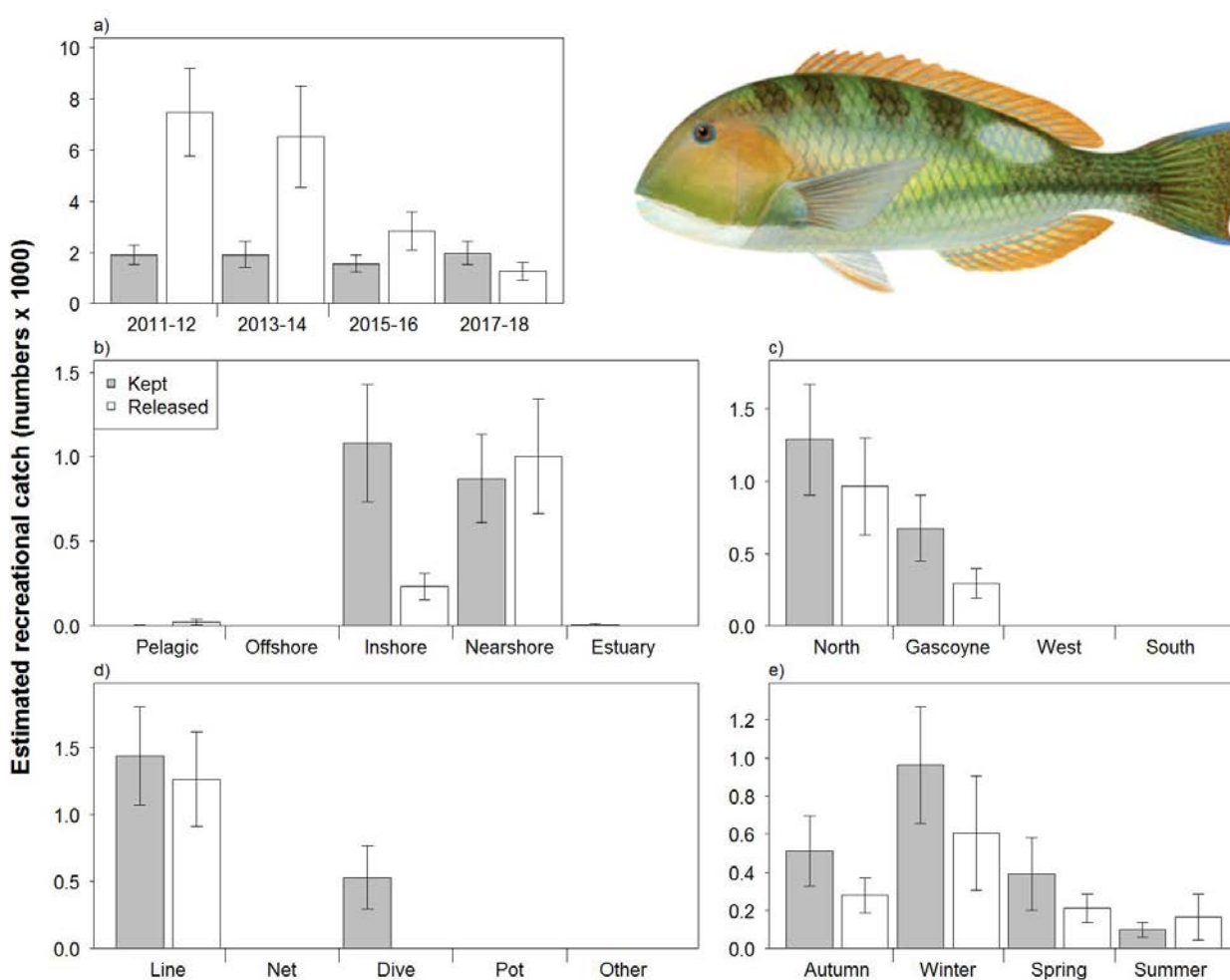
Most boat-based recreational catches of Blackspot Tuskfish occurred in the North Coast, with some catches in the Gascoyne Coast (Figure 74c). The majority of catches were retained (39% released; Table 4, Figure 74a) with most releases attributed to “Under Size” (Table 6). Catches were taken predominantly from inshore demersal and nearshore (Figure 74b). Most catches were taken by line fishing (Figure 74d). Blackspot Tuskfish were harvested throughout the year, with higher catches in winter and autumn compared with spring and summer (Figure 74e). The estimated kept recreational catch of Blackspot Tuskfish in 2017/18 was higher than 2015/16, but similar with 2013/14 and 2011/12 (Figure 74a). The estimated released recreational catch in 2017/18 was similar to 2015/16, but lower than 2013/14 and 2011/12.



**Figure 74.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Blackspot Tuskfish in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.3.25 Blue Tuskfish (*Choerodon cyanodus*)

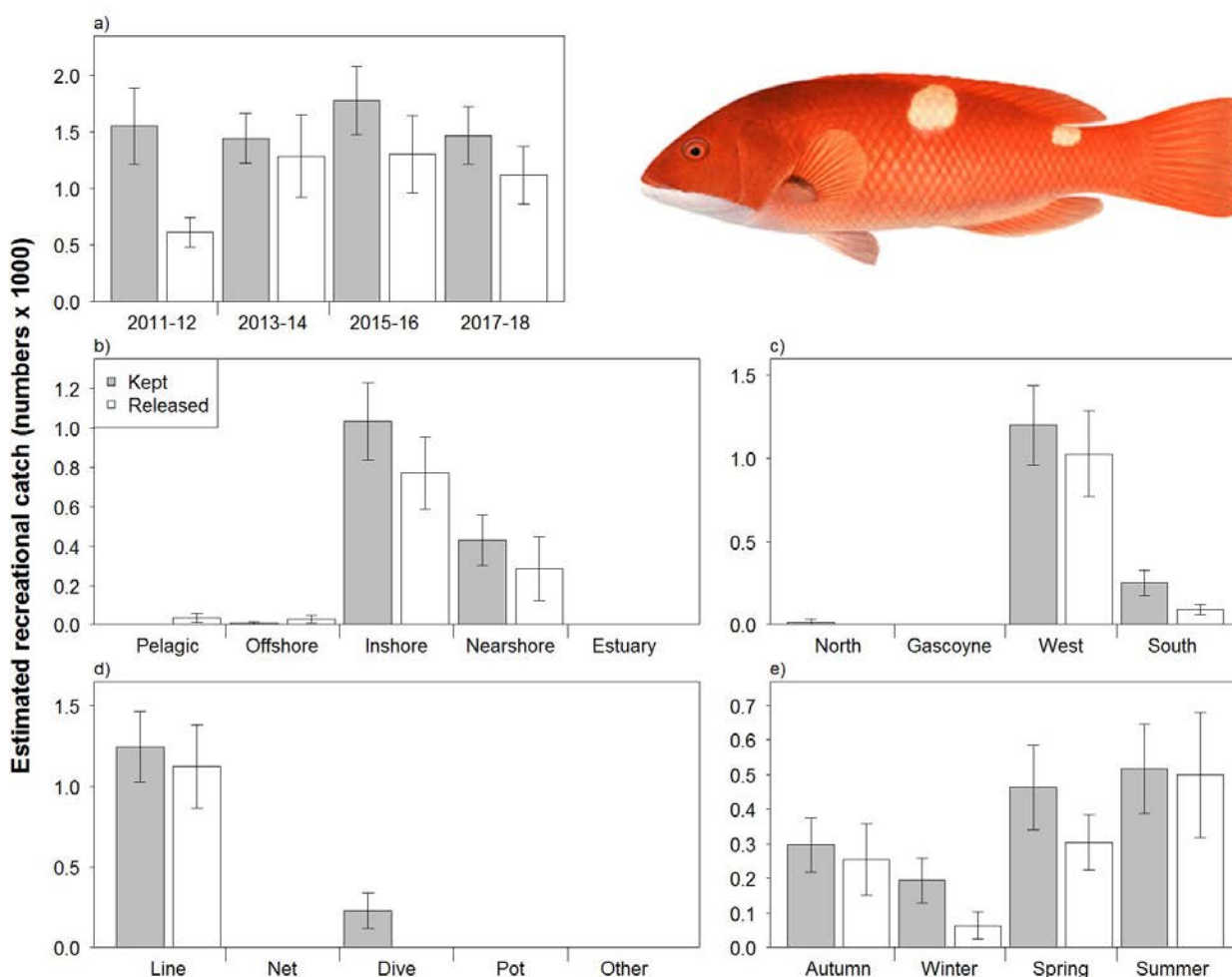
Most boat-based recreational catches of Blue Tuskfish occurred in the North Coast, with some catches in the Gascoyne Coast (Figure 75c). The majority of catches were retained (39% released; Table 4, Figure 75a) with most releases attributed to “Under Size” (Table 6). Catches were taken predominantly from inshore demersal and nearshore (Figure 75b). Most catches were taken by line fishing (Figure 75d). Blue Tuskfish were harvested throughout the year, with higher catches in winter, followed by autumn, spring and summer (Figure 75e). The estimated kept recreational catch of Blue Tuskfish in 2017/18 was similar with previous statewide surveys (Figure 75a). The estimated released recreational catch in 2017/18 was similar to 2015/16, but lower than 2013/14 and 2011/12.



**Figure 75.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Blue Tuskfish in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.3.26 Foxfish (*Bodianus frenchii*)

Most boat-based recreational catches of Foxfish occurred in the West Coast, with some catches in the South Coast (Figure 76c). The majority of catches were retained (43% released; Table 4, Figure 76a) with most releases attributed to “Under Size” and “Too Many” (Table 6). Catches were taken predominantly from inshore demersal and nearshore (Figure 76b). Most catches were taken by line fishing (Figure 76d). Foxfish were harvested throughout the year, with higher catches in spring and summer compared with autumn and winter (Figure 76e). The estimated kept recreational catch of Foxfish in 2017/18 was similar with previous statewide surveys (Figure 76a).

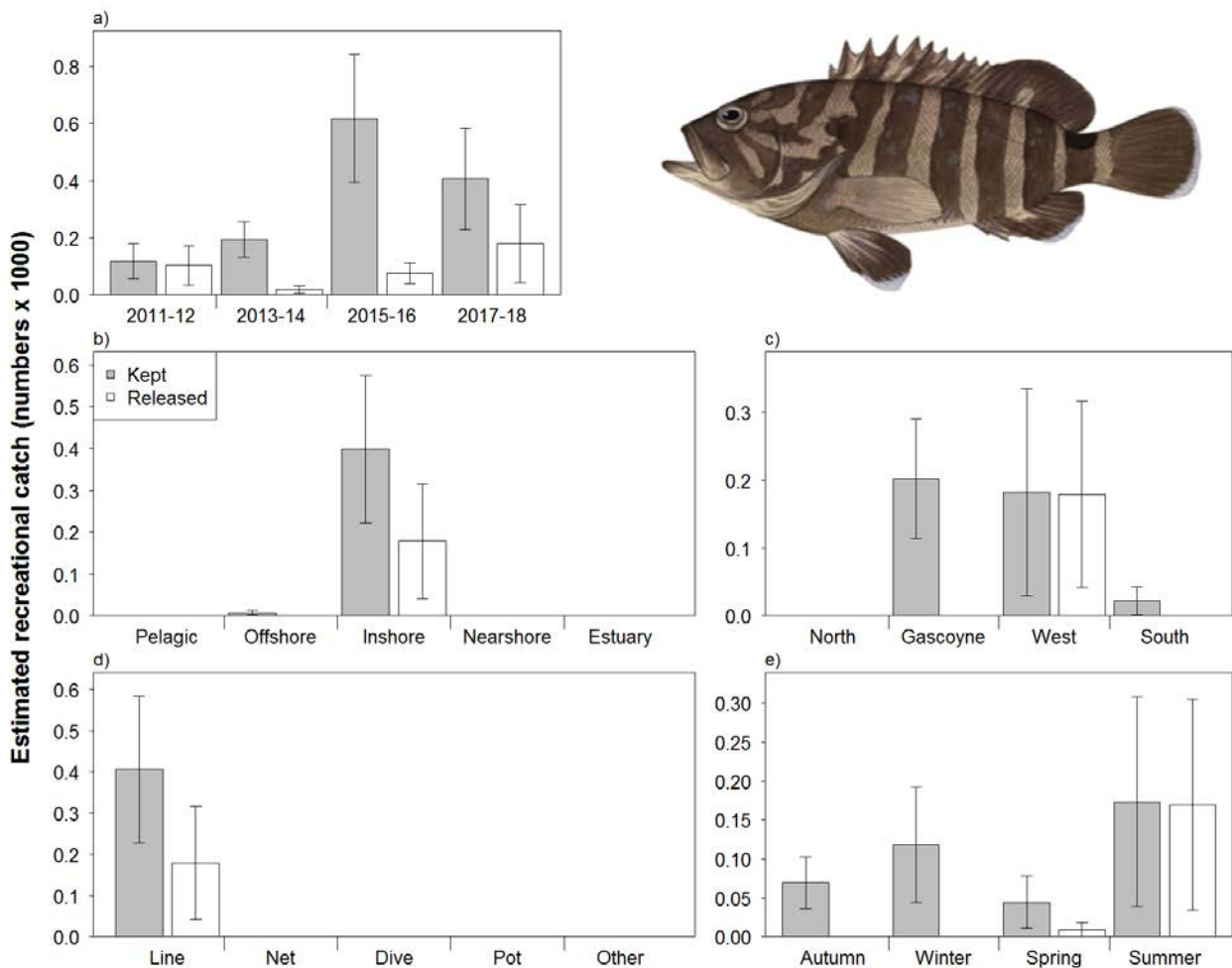


**Figure 76.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Foxfish in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

## 6.4 Offshore Demersal

### 6.4.1 Eightbar Grouper (*Hyporthodus octofasciatus*)

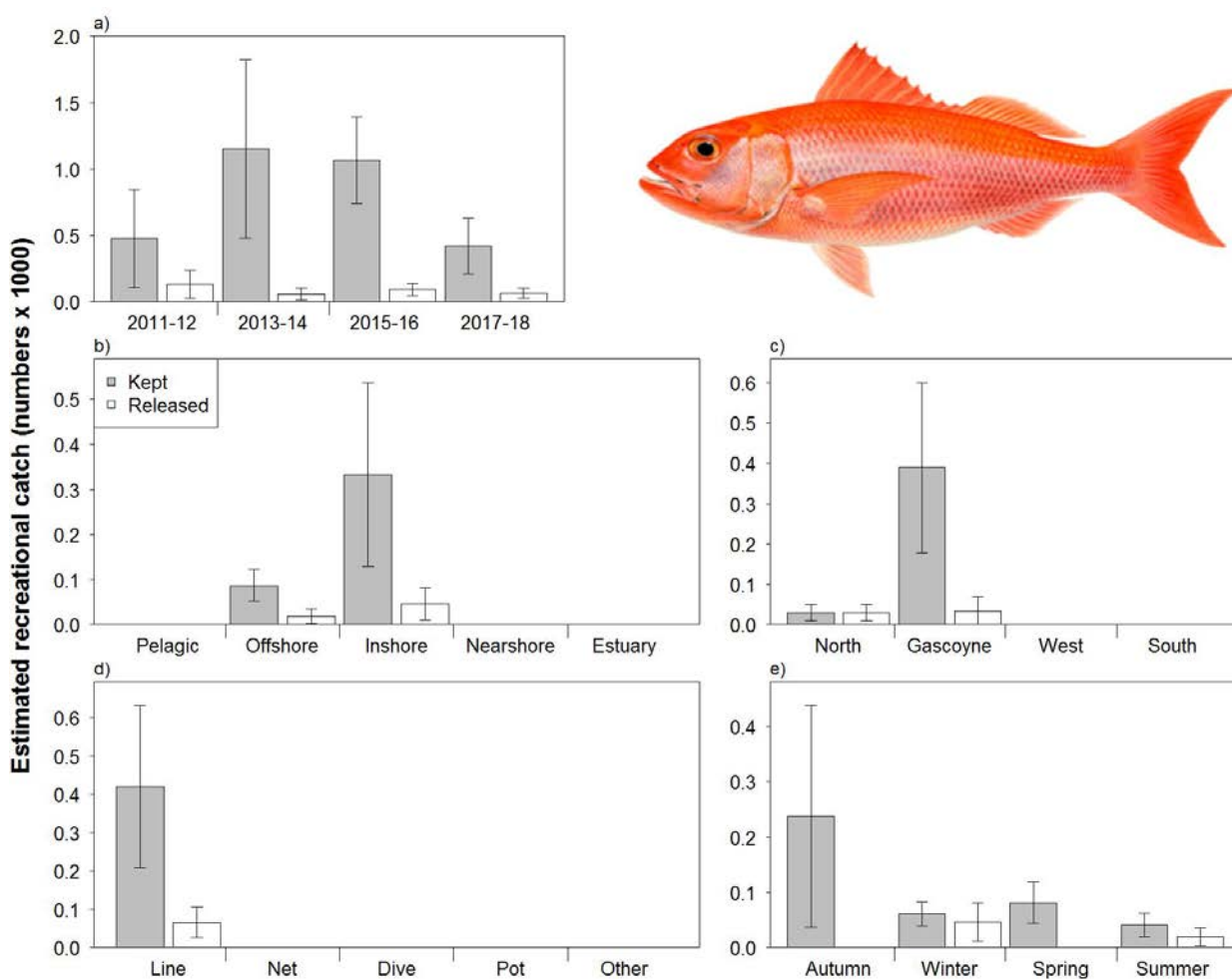
Eightbar Grouper is an indicator species in the North Coast, Gascoyne Coast, West Coast bioregions. Most boat-based recreational catches of Eightbar Grouper occurred in the West Coast and Gascoyne Coast, with some catches in the South Coast (Figure 77c). The majority of catches were retained (31% released; Table 4, Figure 77a). Catches were taken predominantly from inshore demersal (Figure 77b). All catches were taken by line fishing (Figure 77d). Eightbar Grouper were harvested throughout the year, with higher catches in summer, followed by winter, autumn and spring (Figure 77e). The estimated kept recreational catch of Eightbar Grouper in 2017/18 was similar to 2015/16, but higher than 2013/14 and 2011/12; however, the catch estimates for this species have high uncertainty (Figure 77a).



**Figure 77.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Eightbar Grouper in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

## 6.4.2 Ruby Snapper (*Etelis carbunculus*)

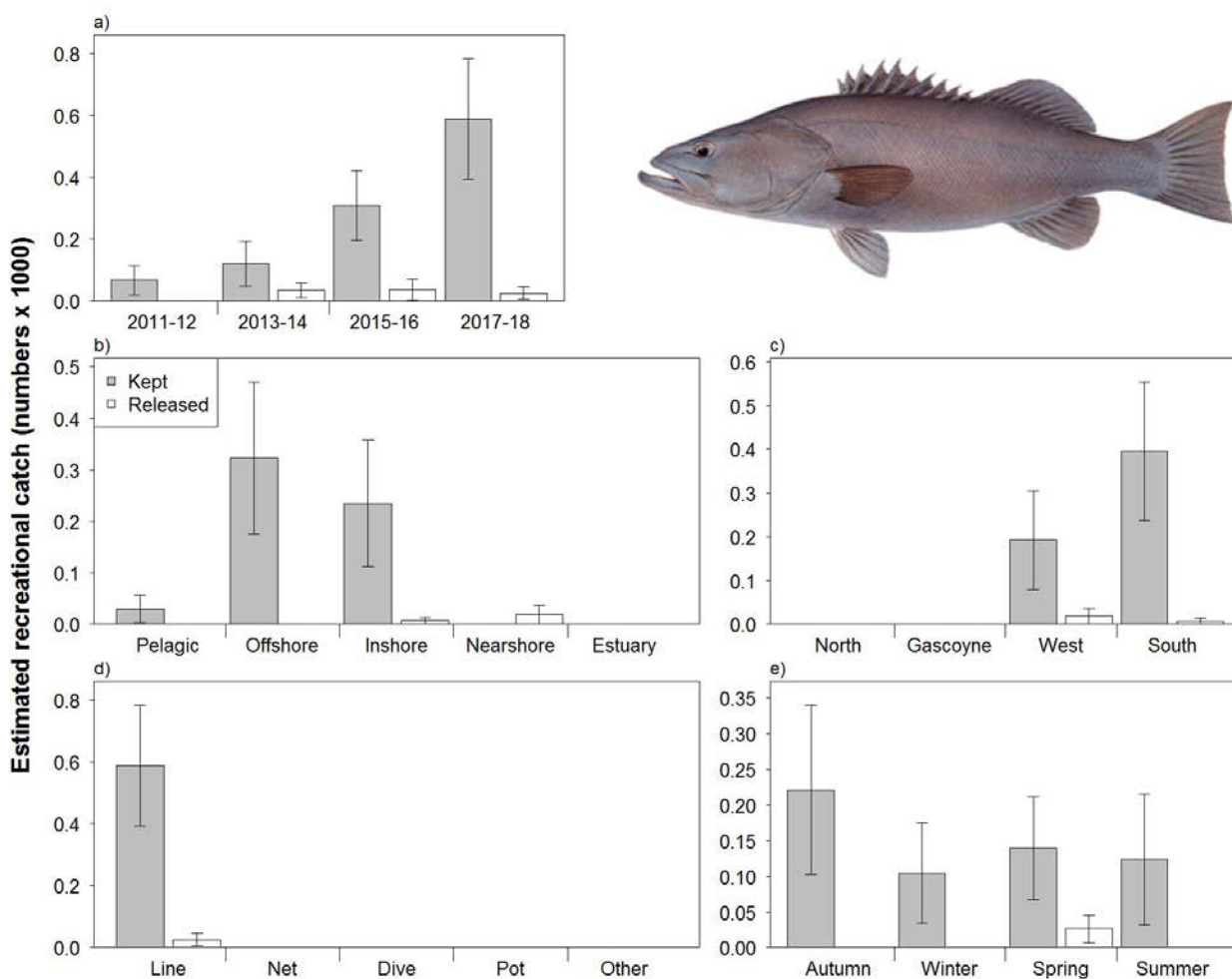
Ruby Snapper is an indicator species in the North Coast and Gascoyne Coast bioregions. Most boat-based recreational catches of Ruby Snapper occurred in the Gascoyne Coast, with some catches in the North Coast (Figure 78c). The majority of catches were retained (14% released; Table 4, Figure 78a). Catches were taken predominantly from inshore demersal and offshore demersal (Figure 78b). All catches were taken by line fishing (Figure 78d). Ruby Snapper were harvested throughout the year, with higher catches in autumn compared with winter, spring and summer (Figure 78e). The estimated kept recreational catch of Ruby Snapper in 2017/18 was lower than 2015/16 and 2013/14, but similar with 2011/12, however, the catch estimates for this species have high uncertainty (Figure 78a).



**Figure 78.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Ruby Snapper in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.4.3 Hapuku (*Polyprion oxygeneios*)

Hapuku is an indicator species in the West Coast and South Coast bioregions. Most boat-based recreational catches of Hapuku occurred in the West Coast, followed by the South Coast (Figure 79c). The majority of catches were retained (4% released; Table 4, Figure 79a). Catches were taken predominantly from offshore demersal and inshore demersal (Figure 79b). All catches were taken by line fishing (Figure 79d). Hapuku were harvested throughout the year, with higher catches in autumn compared with spring, summer and winter (Figure 79e). The estimated kept recreational catch of Hapuku in 2017/18 was similar to 2015/16, and higher than 2013/14 and 2011/12; however, the catch estimates for this species have high uncertainty (Figure 79a).



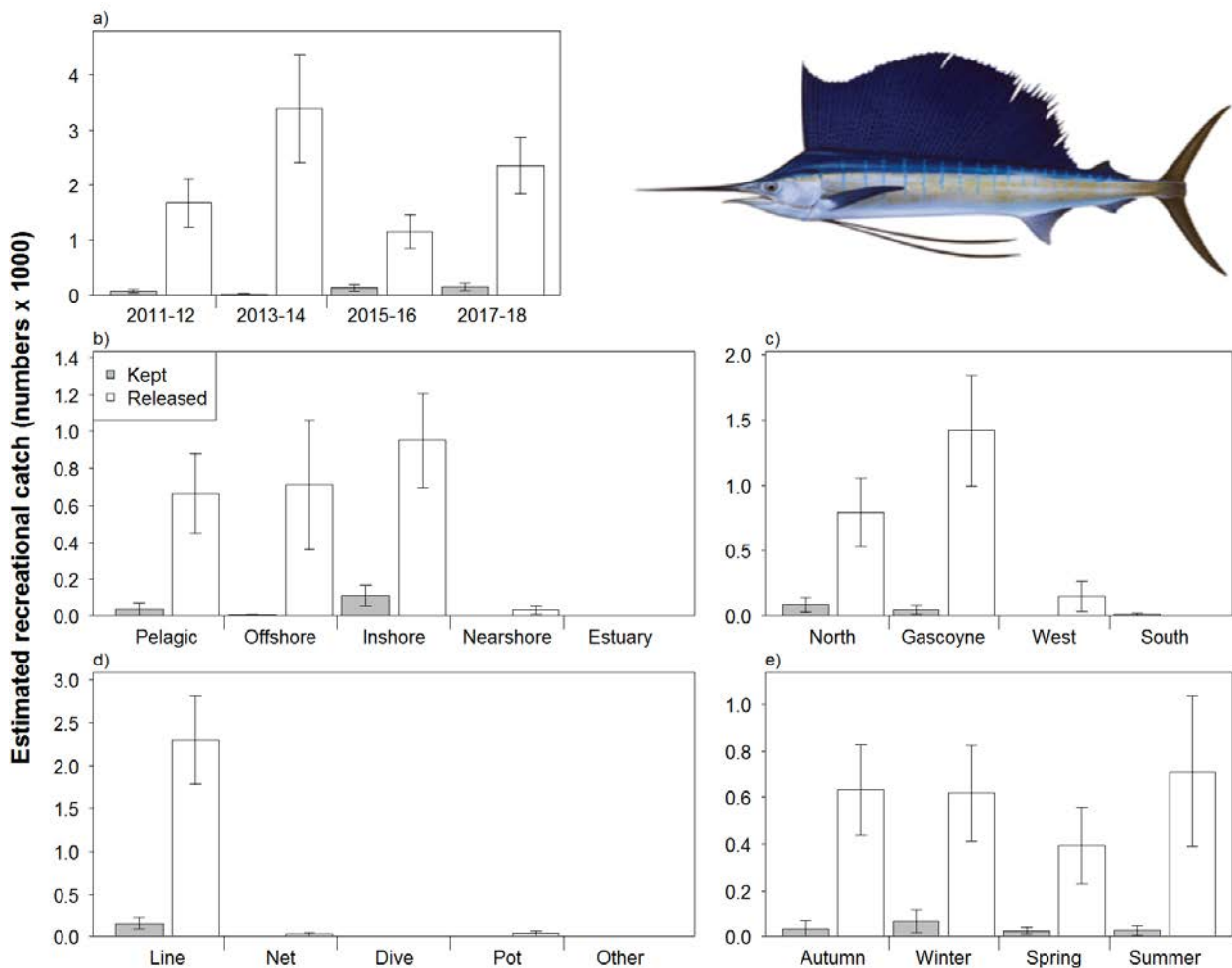
**Figure 79.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Hapuku in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.



## 6.5 Pelagic

### 6.5.1 Billfish (Family Istiophoridae)

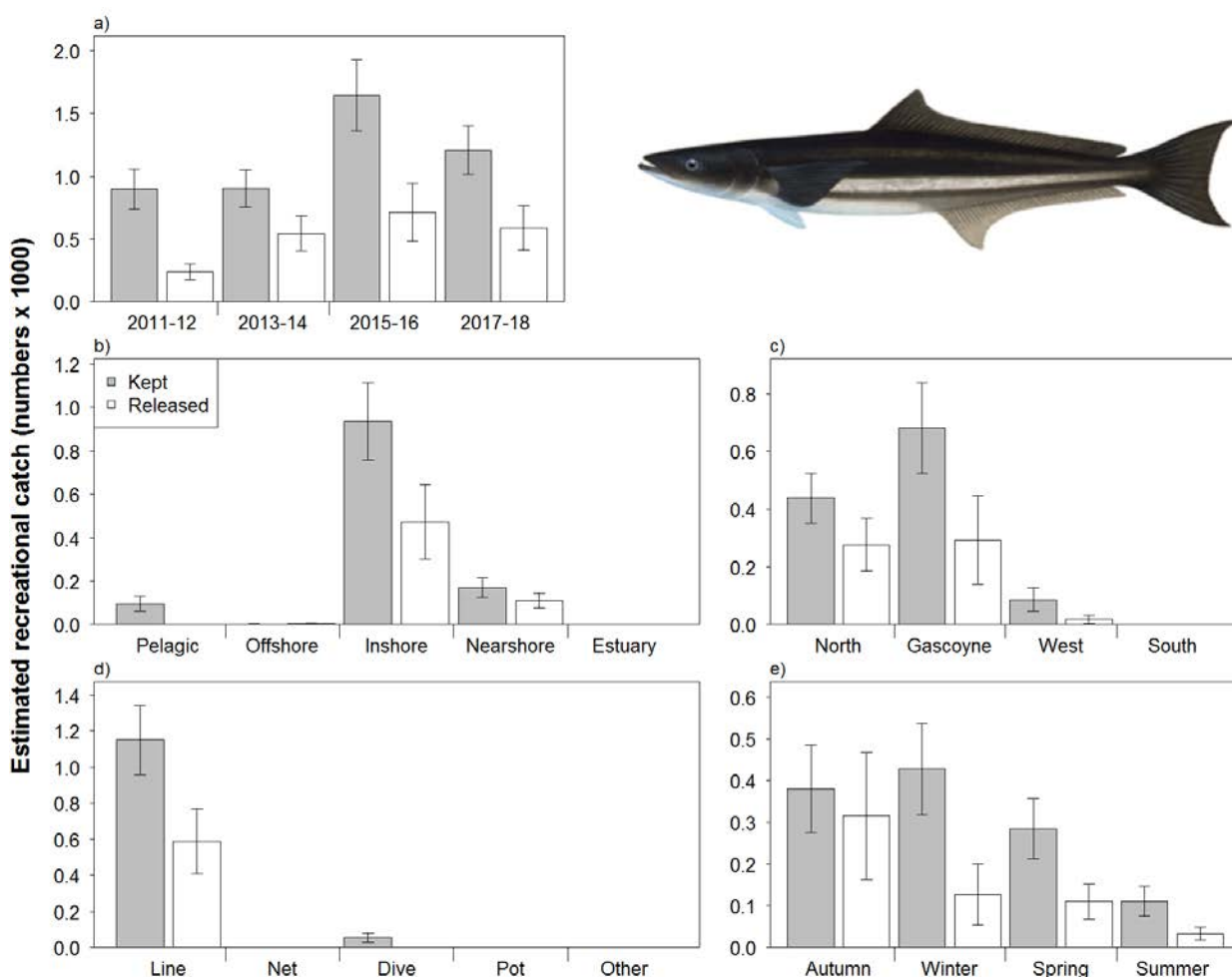
Billfish include Black Marlin (*Makaira indica*), Blue Marlin (*M. nigricans*), Striped Marlin (*Tetrapturus audax*) and Sailfish (*Istiophorus platypterus*). Most boat-based recreational catches of Billfish occurred in the Gascoyne Coast, followed by the North Coast (Figure 80c). The majority of catches were released (86% or higher; Table 4, Figure 80a). Catches were taken predominantly from offshore demersal, inshore demersal and pelagic (Figure 80b). All catches were taken by line fishing (Figure 80d). Billfish were caught throughout the year, with similar catches each season (Figure 80e). The estimated kept and released recreational catches of Billfish in 2017/18 were similar with previous statewide surveys; however, the uncertainty for this species group is high (Figure 80a).



**Figure 80.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Billfish in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.5.2 Cobia (*Rachycentron canadum*)

Most boat-based recreational catches of Cobia occurred in the Gascoyne Coast, with some catches in the North Coast and West Coast (Figure 81c). The majority of catches were retained (33% released; Table 4, Figure 81a) with most releases attributed to "Under Size" and "Other" (Table 6). Catches were taken predominantly from inshore demersal (Figure 81b). Most catches were taken by line fishing (Figure 81d). Cobia were harvested throughout the year, with higher catches in autumn and winter compared with spring and summer (Figure 81e). The estimated kept and released recreational catches of Cobia were similar with previous statewide surveys (Figure 81a).

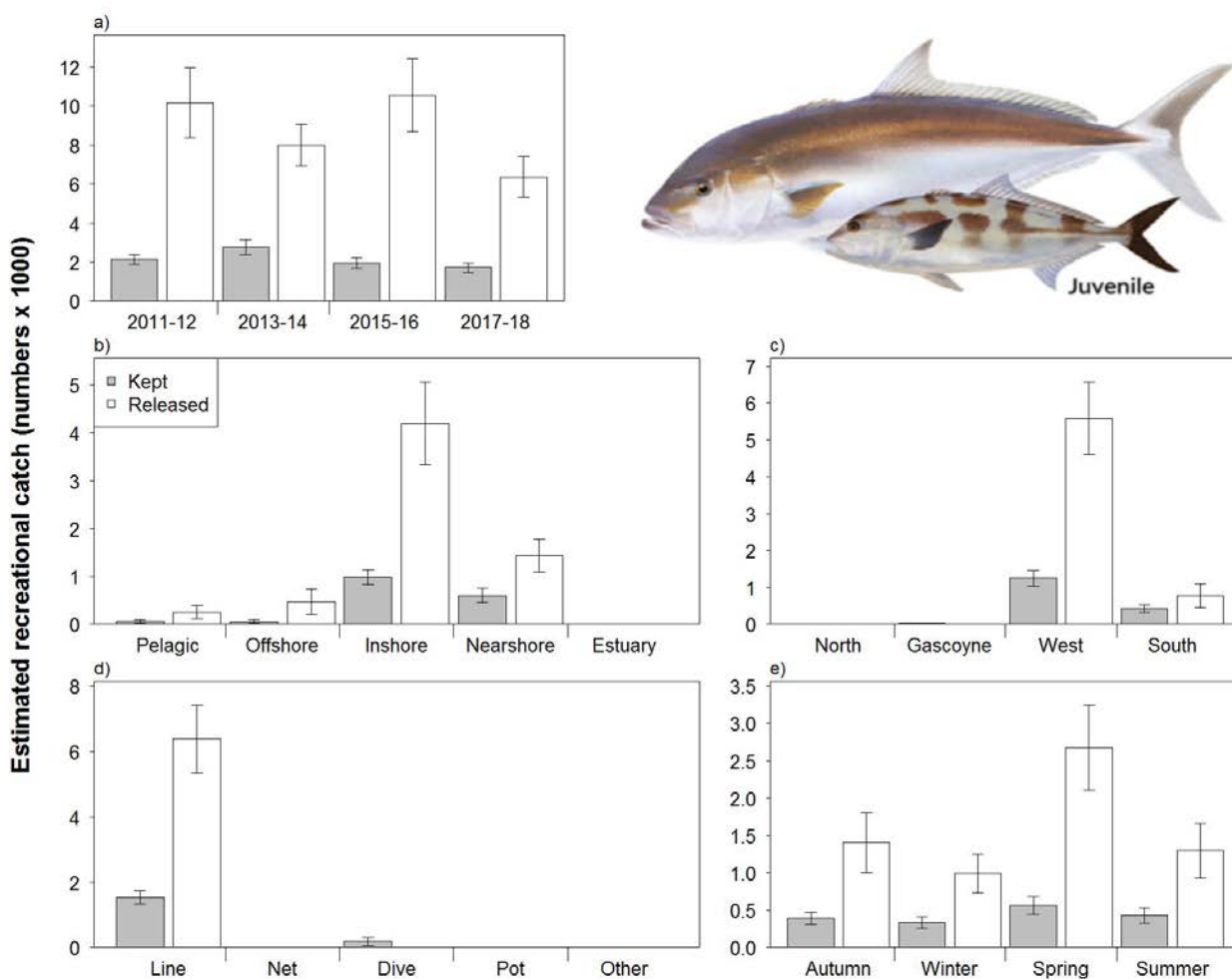


**Figure 81.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Cobia in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.



### 6.5.3 Samsonfish (*Seriola hippos*)

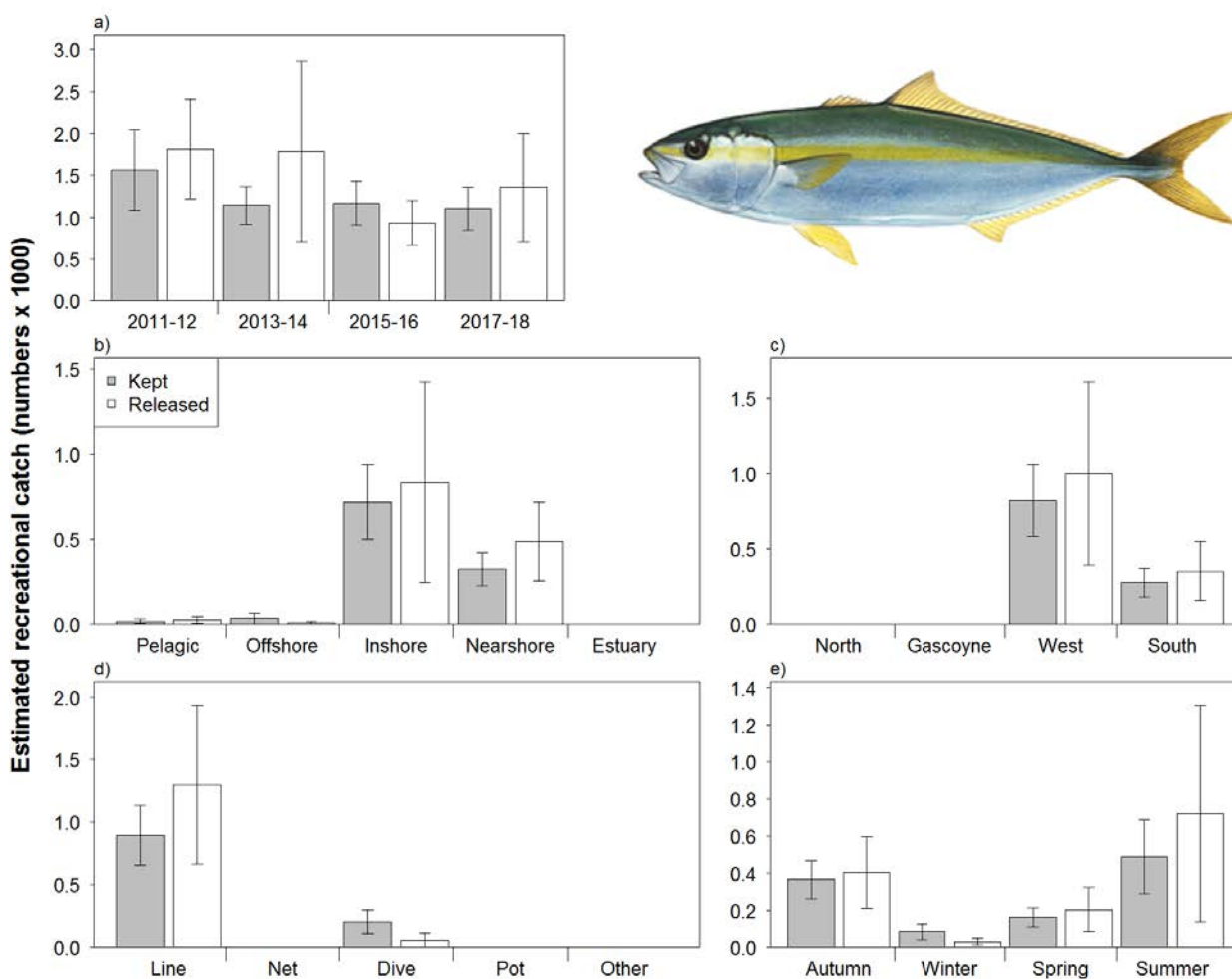
Samsonfish is an indicator species in the West Coast bioregion. Most boat-based recreational catches of Samsonfish occurred in the West Coast, followed by the South Coast (Figure 82c). The majority of catches were released (79%; Table 4, Figure 82a) and attributed to “Too Many” and “Other” (Table 6). Catches were taken from inshore demersal (Figure 82b). Catches were mostly taken by line fishing (Figure 82d). Samsonfish were harvested throughout the year, with higher catches in spring compared with summer, winter and autumn (Figure 82e). The estimated kept and released recreational catches of Samsonfish in 2017/18 were similar with previous statewide surveys (Figure 82a).



**Figure 82.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Samsonfish in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.5.4 Yellowtail Kingfish (*Seriola lalandi*)

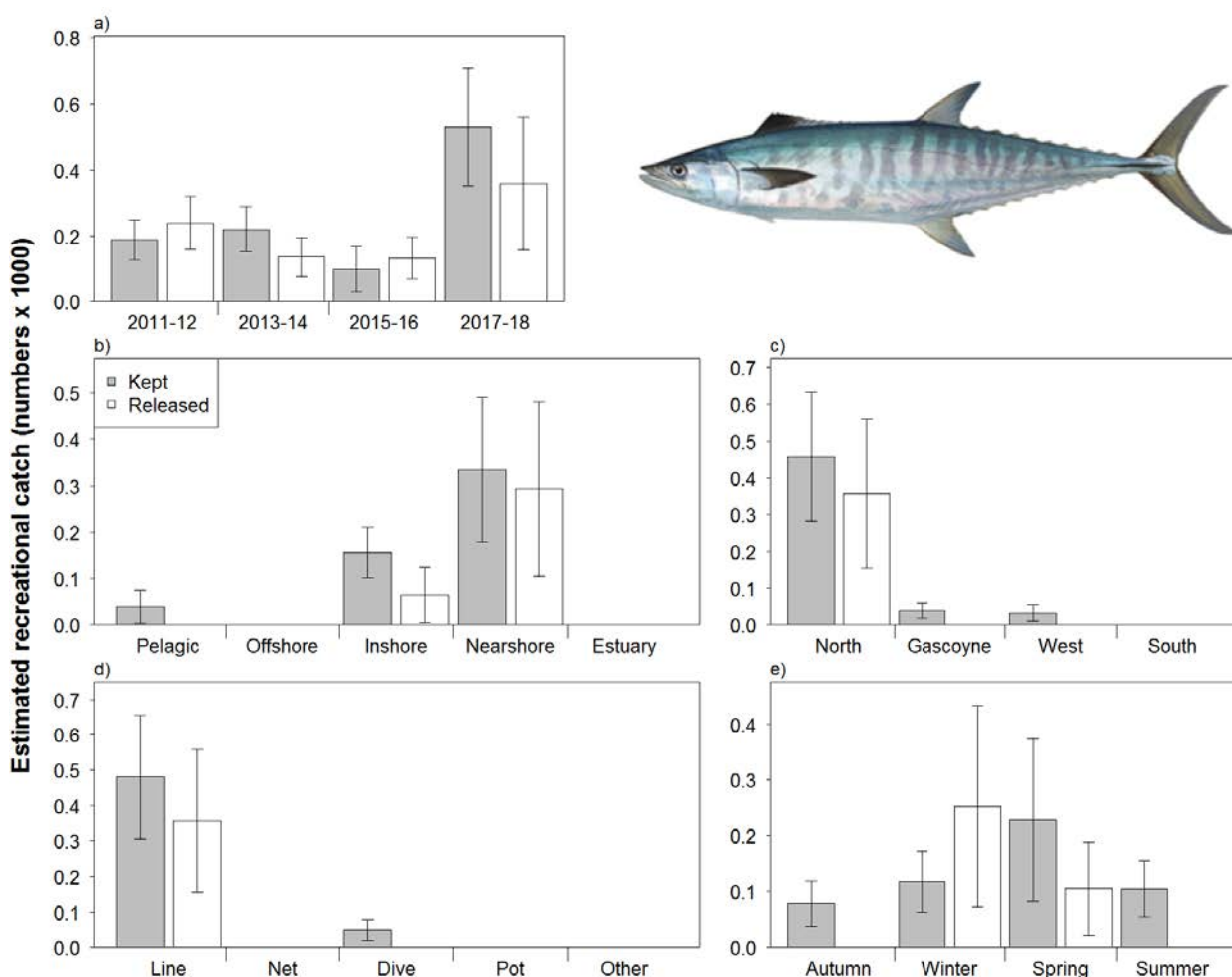
Most boat-based recreational catches of Yellowtail Kingfish occurred in the Gascoyne Coast and West Coast, with some catches in the North Coast (Figure 83c). Similar proportions of the boat-based recreational catch were kept and released (55% released; Table 4, Figure 83a) with most releases attributed to "Catch and Release" (Table 6). Catches were taken predominantly from inshore demersal and pelagic (Figure 83b). Most catches were taken by line fishing (Figure 83d). Yellowtail Kingfish were harvested throughout the year, with lower catches in winter (Figure 83e). The estimated kept recreational catch of Yellowtail Kingfish in 2017/18 was similar to 2015/16 and 2013/14, but lower than 2011/12 (Figure 83a).



**Figure 83.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Yellowtail Kingfish in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.5.5 Grey Mackerel (*Scomberomorus semifasciatus*)

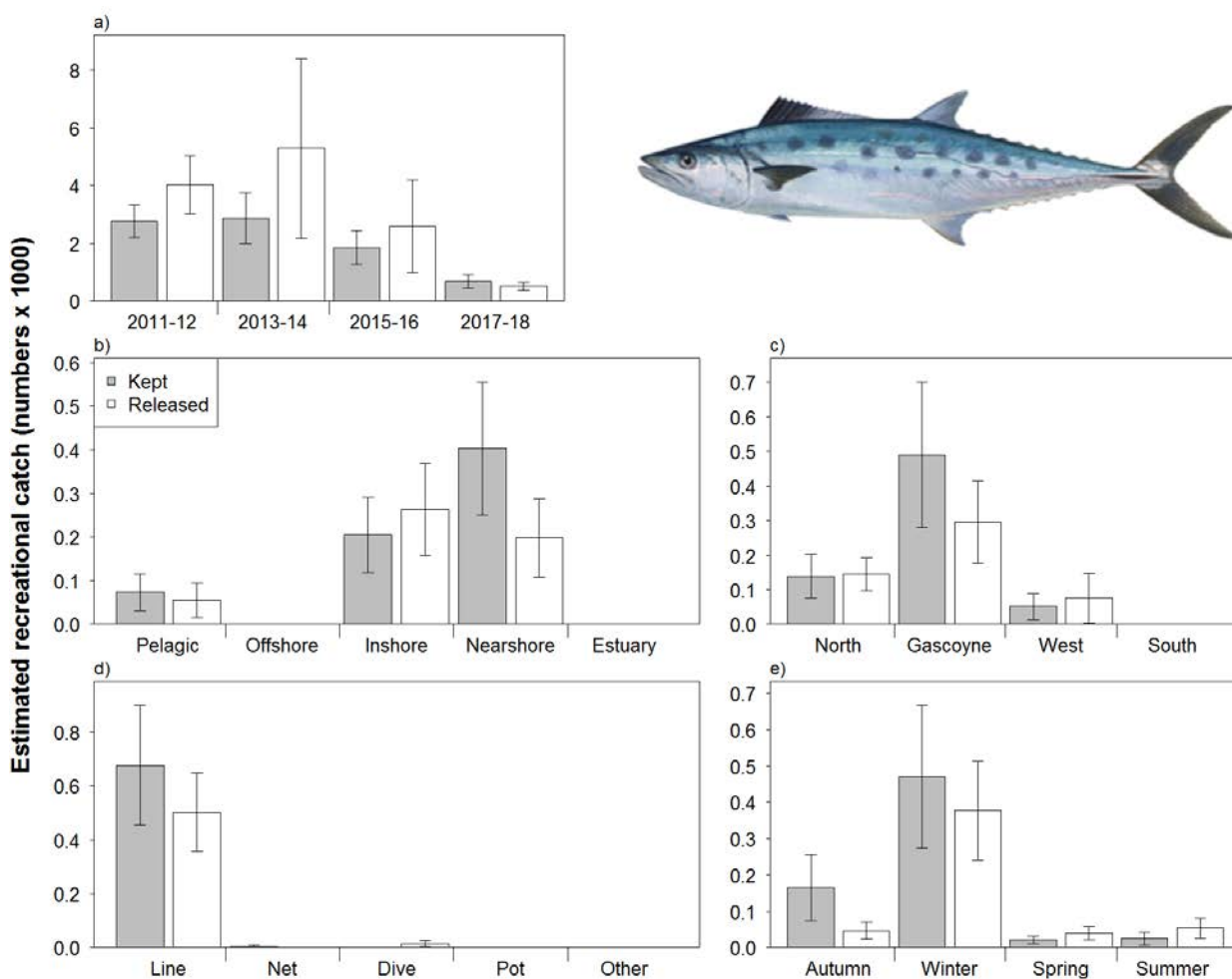
Grey Mackerel is an indicator species in the North Coast and Gascoyne Coast bioregions. Most boat-based recreational catches of Grey Mackerel occurred in the North Coast, with some catches in the Gascoyne Coast and West Coast (Figure 84c). The majority of catches were retained (40% released; Table 4, Figure 84a). Most catches were taken by line fishing (Figure 84d). Grey Mackerel were harvested throughout the year, with higher catches in winter and spring (Figure 84e). The estimated kept recreational catch of Grey Mackerel in 2017/18 was higher than previous statewide surveys, however, the catch estimates for this species have high uncertainty (Figure 84a).



**Figure 84.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Grey Mackerel in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.5.6 School Mackerel (*Scomberomorus queenslandicus*)

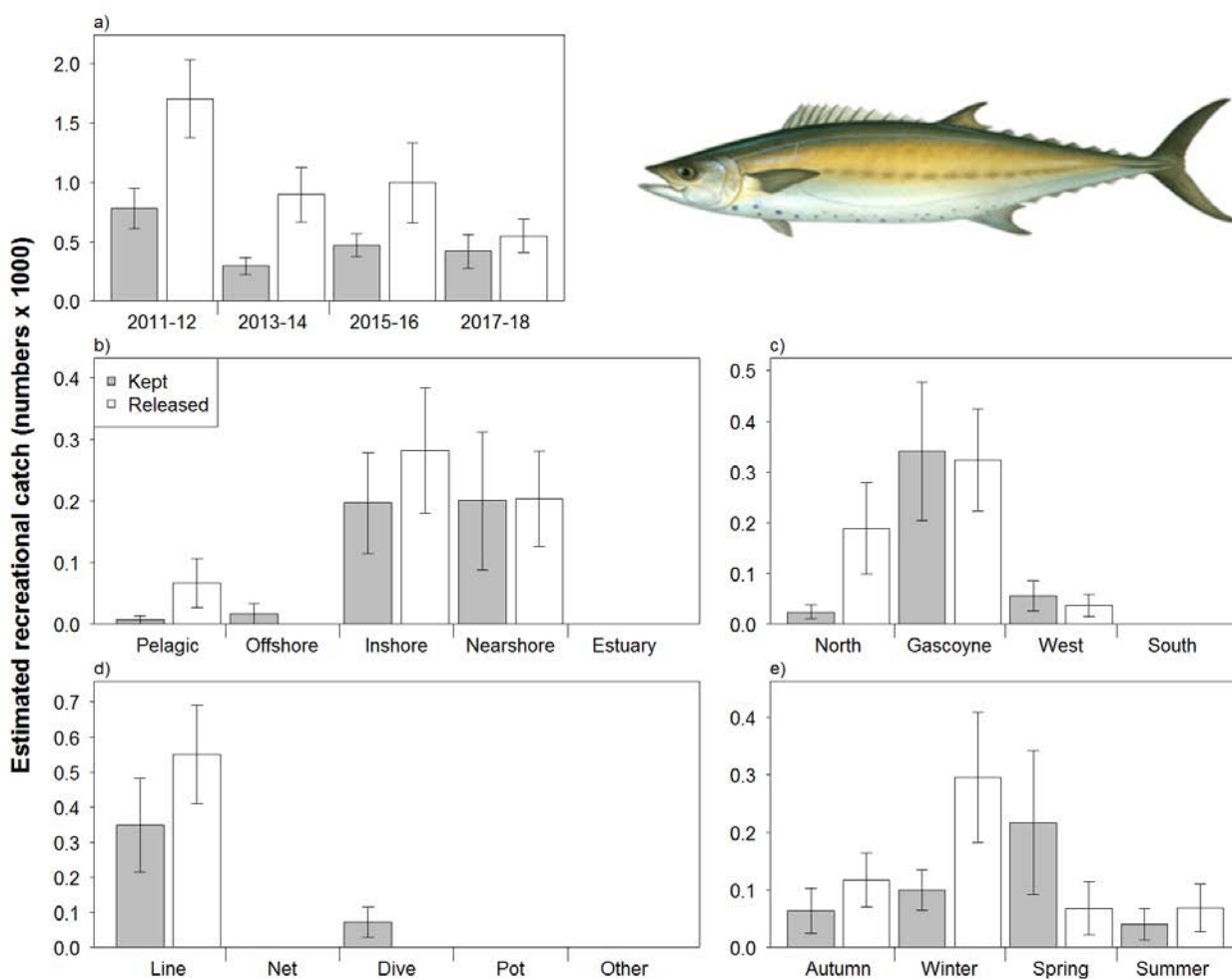
Most boat-based recreational catches of School Mackerel occurred in the Gascoyne Coast, with some catches in the North Coast and West Coast (Figure 85c). The majority of catches were retained (43% released; Table 4, Figure 85a) with most releases attributed to “Under Size” and “Too Many” (Table 6). Catches were taken predominantly from nearshore, inshore demersal and pelagic (Figure 85b). Most catches were taken by line fishing (Figure 85d). School Mackerel were harvested throughout the year, with higher catches in winter compared with autumn, spring and summer (Figure 85e). The estimated kept and released recreational catches of School Mackerel in 2017/18 were lower than previous statewide surveys (Figure 85a).



**Figure 85.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of School Mackerel in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.5.7 Shark Mackerel (*Grammatorcynus bicarinatus*)

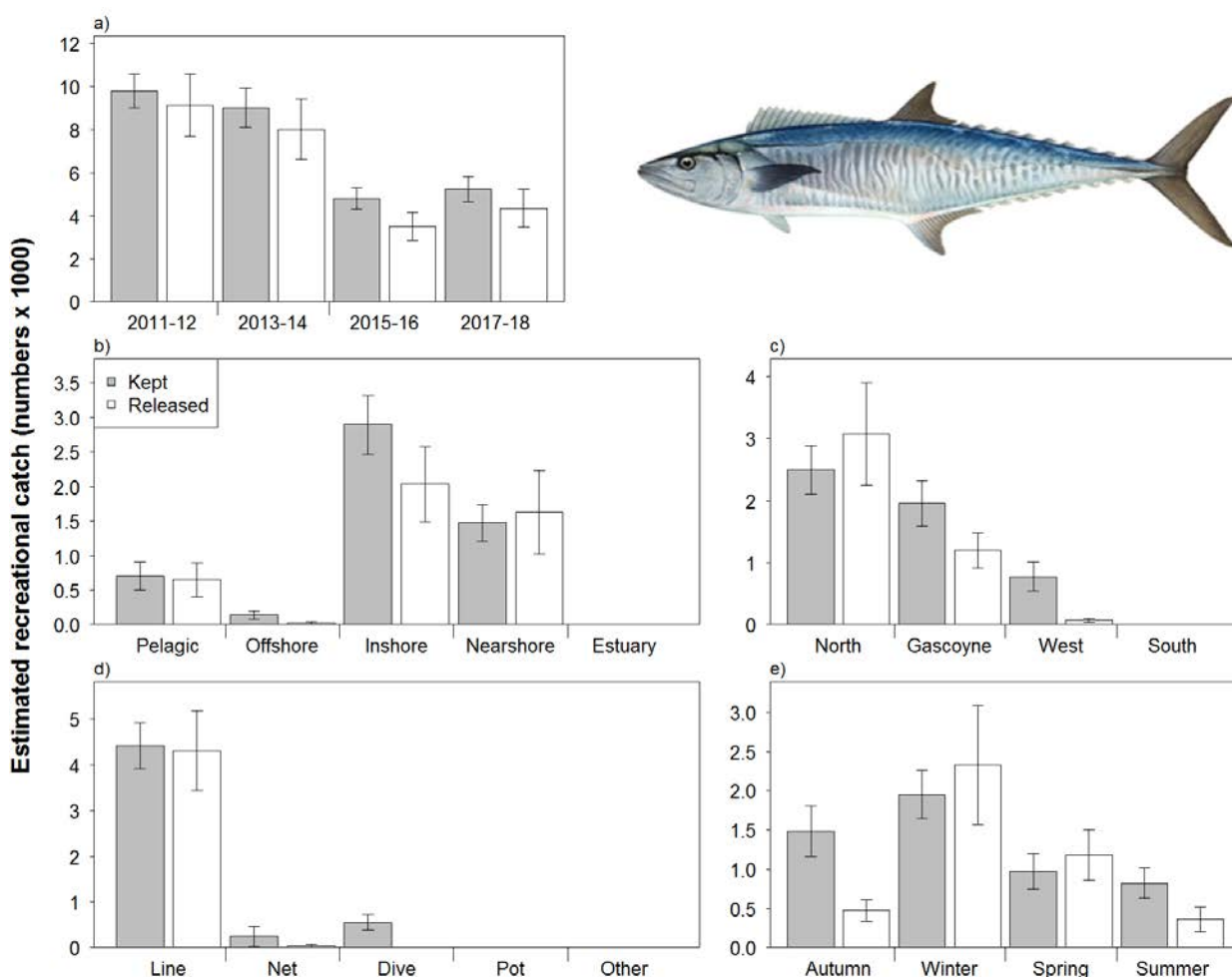
Most boat-based recreational catches of Shark Mackerel occurred in the Gascoyne Coast, with some catches in the North Coast and West Coast (Figure 86c). The majority of catches were released (57%; Table 4, Figure 86a) with most releases attributed to "Too Small," "Under Size" and "Catch and Release" (Table 6). Catches were taken predominantly from inshore demersal and nearshore (Figure 86b). Most catches were taken by line fishing (Figure 86d). Shark Mackerel were harvested throughout the year, with higher catches in winter and spring compared with summer and autumn (Figure 86e). The estimated kept and released recreational catches of Shark Mackerel in 2017/18 were similar with 2015/16 and 2013/14 but lower than 2011/12 (Figure 86a).



**Figure 86.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Shark Mackerel in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.5.8 Spanish Mackerel (*Scomberomorus commerson*)

Spanish Mackerel is an indicator species in the North Coast and Gascoyne Coast bioregions. Most boat-based recreational catches of Spanish Mackerel occurred in the Gascoyne Coast and North Coast, with some catches in the West Coast (Figure 87c). The majority of catches were retained (45% released; Table 4, Figure 87a) with most releases attributed to “Under Size” and “Other” (Table 6). Catches were taken from inshore demersal, nearshore and pelagic (Figure 87b). Catches were mostly taken by line fishing (Figure 87d). Spanish Mackerel were harvested throughout the year, with higher catches in autumn and winter compared with spring and summer (Figure 87e). The estimated kept and released recreational catches of Spanish Mackerel in 2017/18 were similar to 2015/16, but lower than 2013/14 and 2011/12 (Figure 87a).

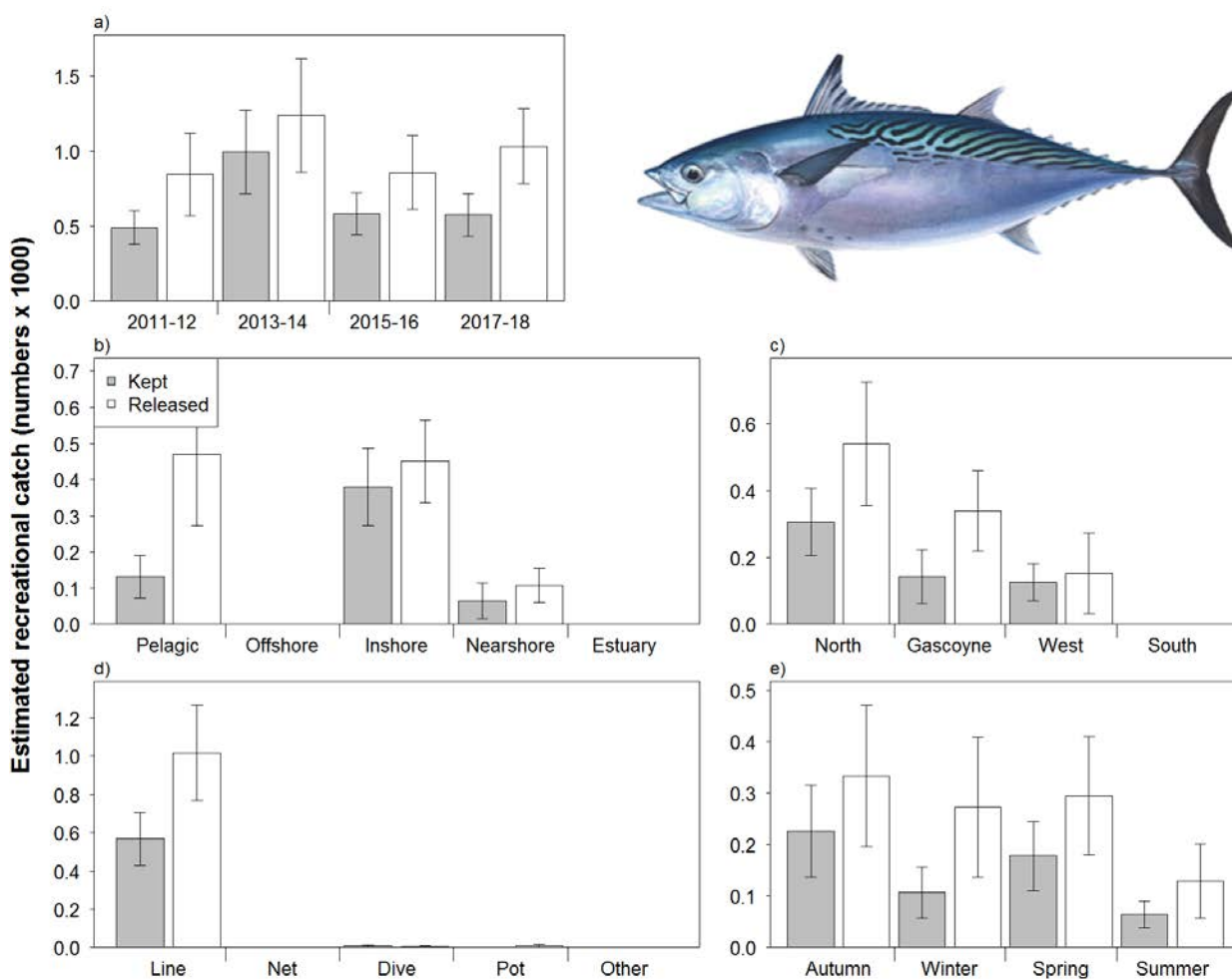


**Figure 87.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Spanish Mackerel in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.



### 6.5.9 Mackerel Tuna (*Euthynnus affinis*)

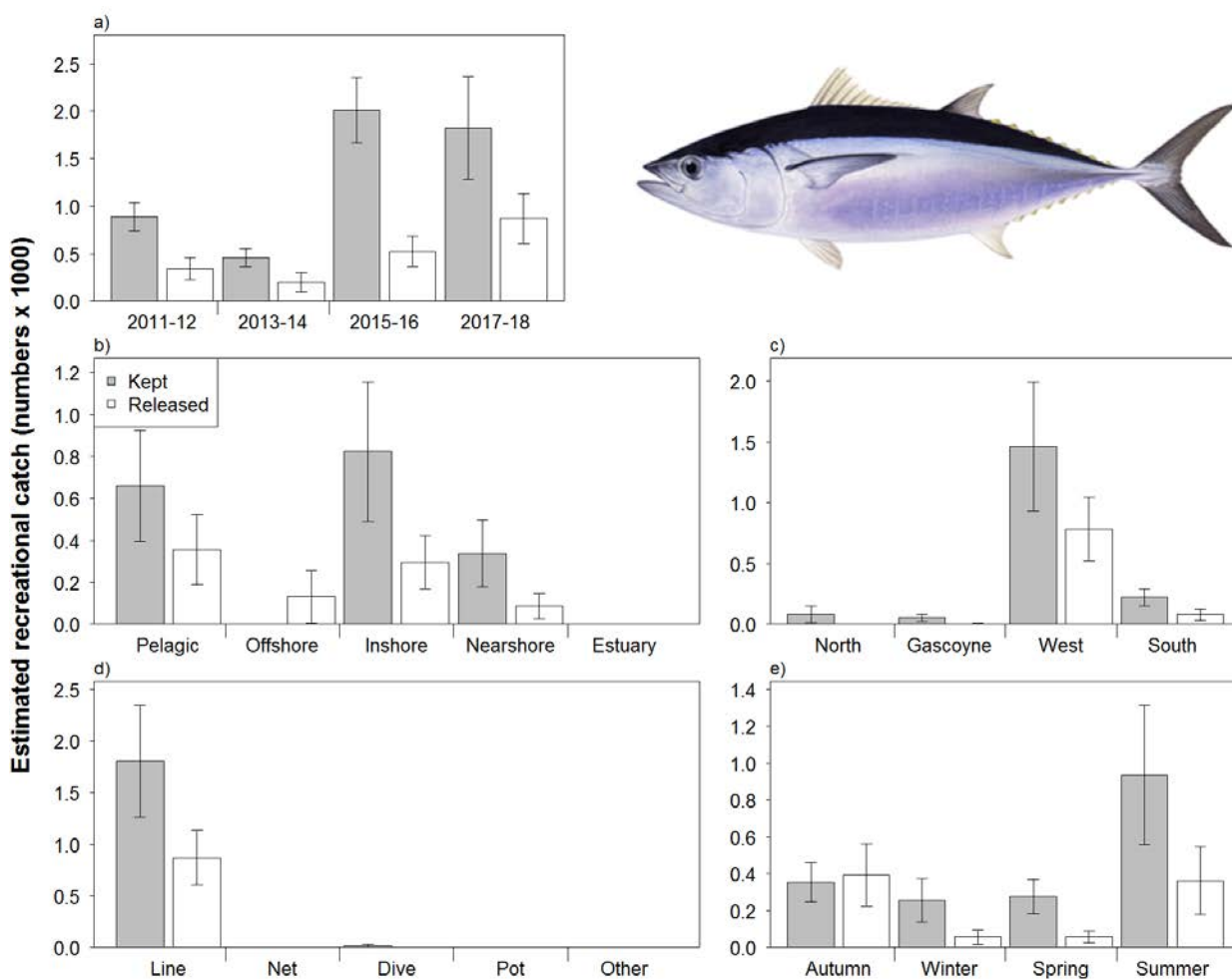
Most boat-based recreational catches of Mackerel Tuna occurred in the North Coast, with some catches in the Gascoyne Coast and West Coast (Figure 88c). The majority of catches were released (64%; Table 4, Figure 88a) with most releases attributed to “Other”, “Catch and Release” and “Too Many” (Table 6). Catches were taken predominantly from inshore demersal and pelagic (Figure 88b). Most catches were taken by line fishing (Figure 88d). Mackerel Tuna were harvested throughout the year, with lower catches in summer (Figure 88e). The estimated kept and released recreational catches of Mackerel Tuna in 2017/18 were similar with previous statewide surveys (Figure 88a).



**Figure 88.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Mackerel Tuna in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.5.10 Southern Bluefin Tuna (*Thunnus maccoyii*)

Most boat-based recreational catches of Southern Bluefin Tuna occurred in the West Coast, with some catches in the South Coast, North Coast and Gascoyne Coast (Figure 89c). The majority of catches were retained (32% released; Table 4, Figure 89a) with most releases attributed to “Other” and “Catch and Release” (Table 6). Catches were taken predominantly from inshore demersal and pelagic (Figure 89b). Most catches were taken by line fishing (Figure 89d). Southern Bluefin Tuna were harvested throughout the year, with higher catches in summer compared with autumn, winter and spring (Figure 89e). The estimated kept recreational catch of Southern Bluefin Tuna in 2017/18 was similar to 2015/16, and higher than 2013/14 and 2011/12 (Figure 89a).

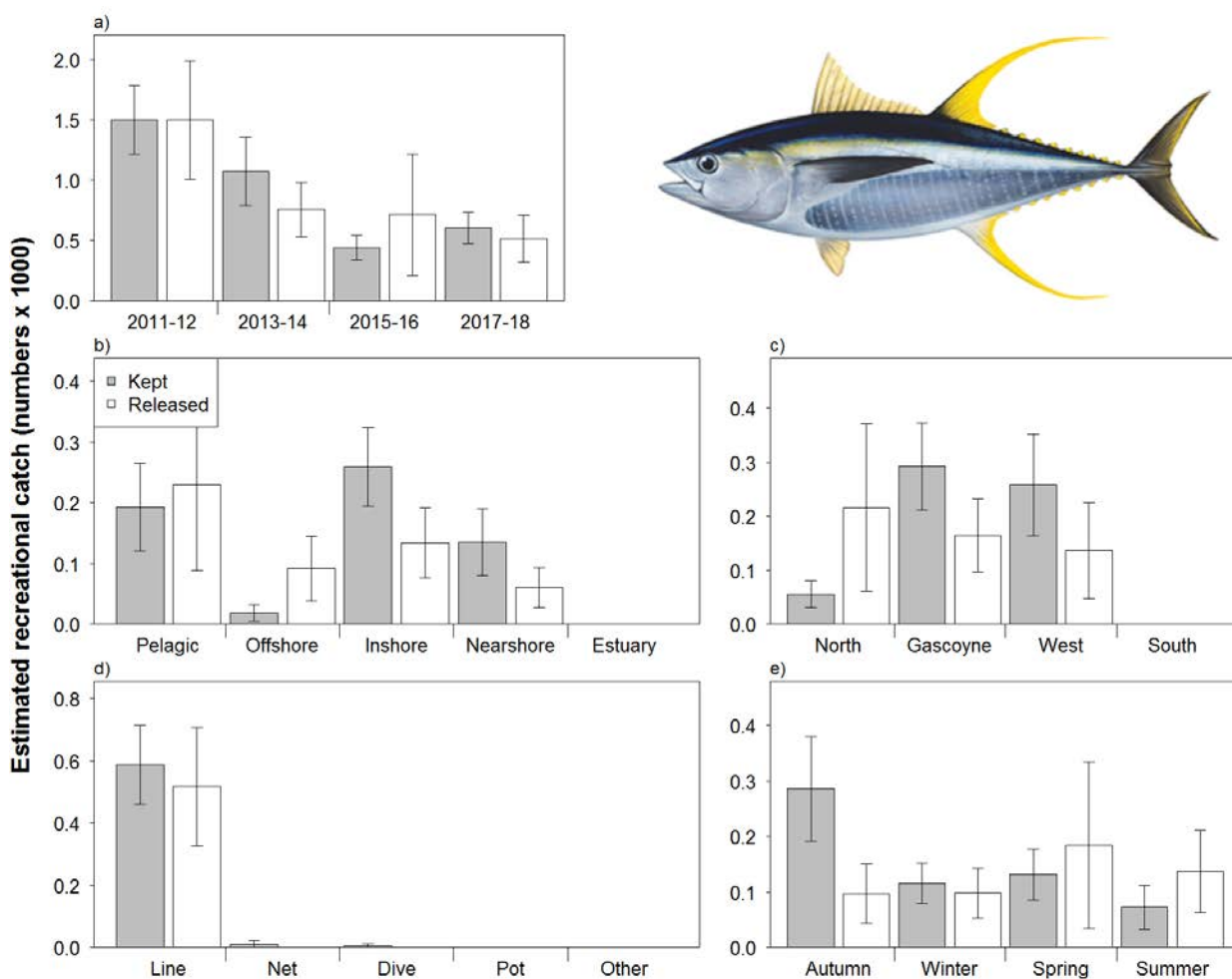


**Figure 89.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Southern Bluefin Tuna in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.



### 6.5.11 Yellowfin Tuna (*Thunnus albacares*)

Most boat-based recreational catches of Yellowfin Tuna occurred in the Gascoyne Coast and West Coast, with some catches in the North Coast (Figure 90c). Similar proportions of the boat-based recreational catch were kept and released (46% released; Table 4, Figure 90a) with most releases attributed to "Catch and Release" (Table 6). Catches were taken predominantly from inshore demersal and pelagic (Figure 90b). Most catches were taken by line fishing Figure 90d). Yellowfin Tuna were harvested throughout the year, with higher catches in autumn compared with winter, spring and summer (Figure 90e). The estimated kept and released recreational catches of Yellowfin Tuna in 2017/18 were similar to 2015/16 and 2013/14, but lower than 2011/12 (Figure 90a).

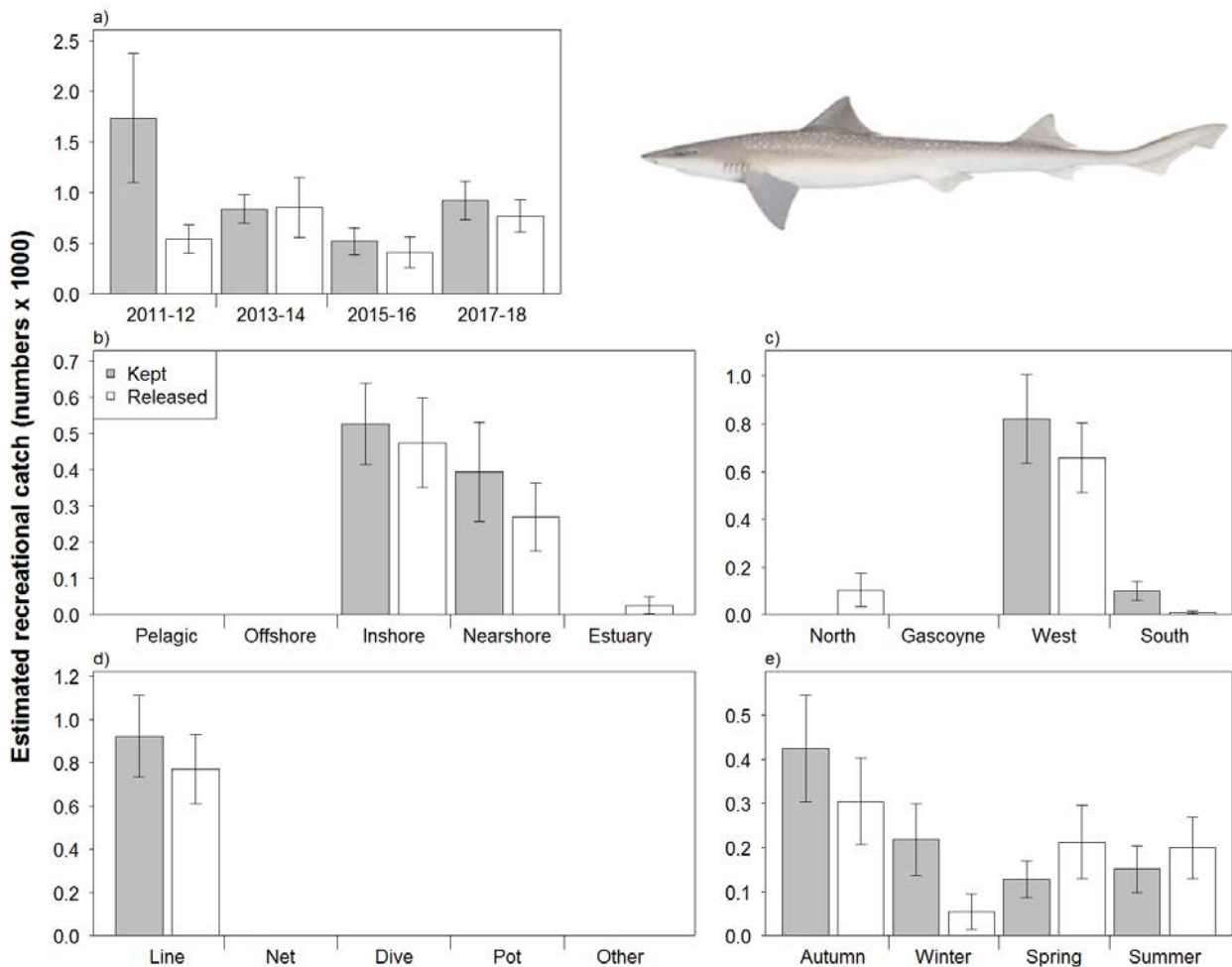


**Figure 90.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Yellowfin Tuna in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

## 6.6 Sharks

### 6.6.1 Gummy Sharks (*Mustelus antarcticus* and *M. stevensi*)

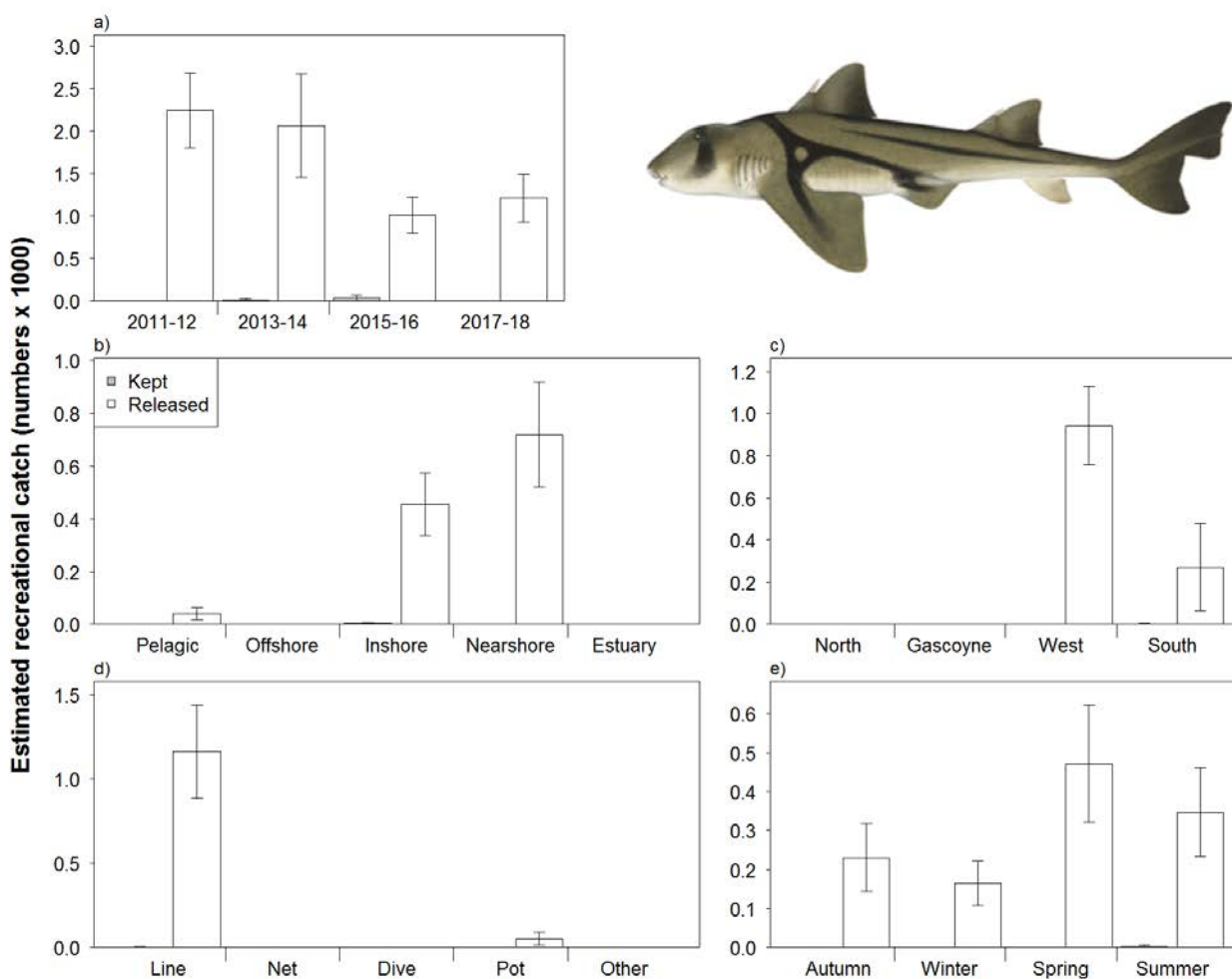
Gummy Sharks includes Gummy Shark (*Mustelus antarcticus*), which occurs nearshore to about 80m from the South Coast to Geraldton, and Western Spotted Gummy Shark (*M. stevensi*), which occurs at depths of 120–400m from Shark Bay to the Kimberley (Last and Stevens 2009). Most boat-based recreational catches of Gummy Sharks occurred in the West Coast, with some catches in the South Coast (Figure 91c). Similar proportions of the boat-based recreational catch were kept and released (46% released; Table 4, Figure 91a) and attributed to “Too Many” and “Catch and Release” (Table 6). Catches were taken predominantly from inshore demersal and nearshore (Figure 91b). All catches were taken by line fishing (Figure 91d). Gummy Sharks were harvested throughout the year, with higher catches in autumn and winter (Figure 91e). The estimated kept recreational catch of Gummy Sharks in 2017/18 was similar to 2015/16 and 2013/14, but lower than 2011/12 (Figure 91a).



**Figure 91.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Gummy Sharks in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

## 6.6.2 Port Jackson Shark (*Heterodontus portusjacksoni*)

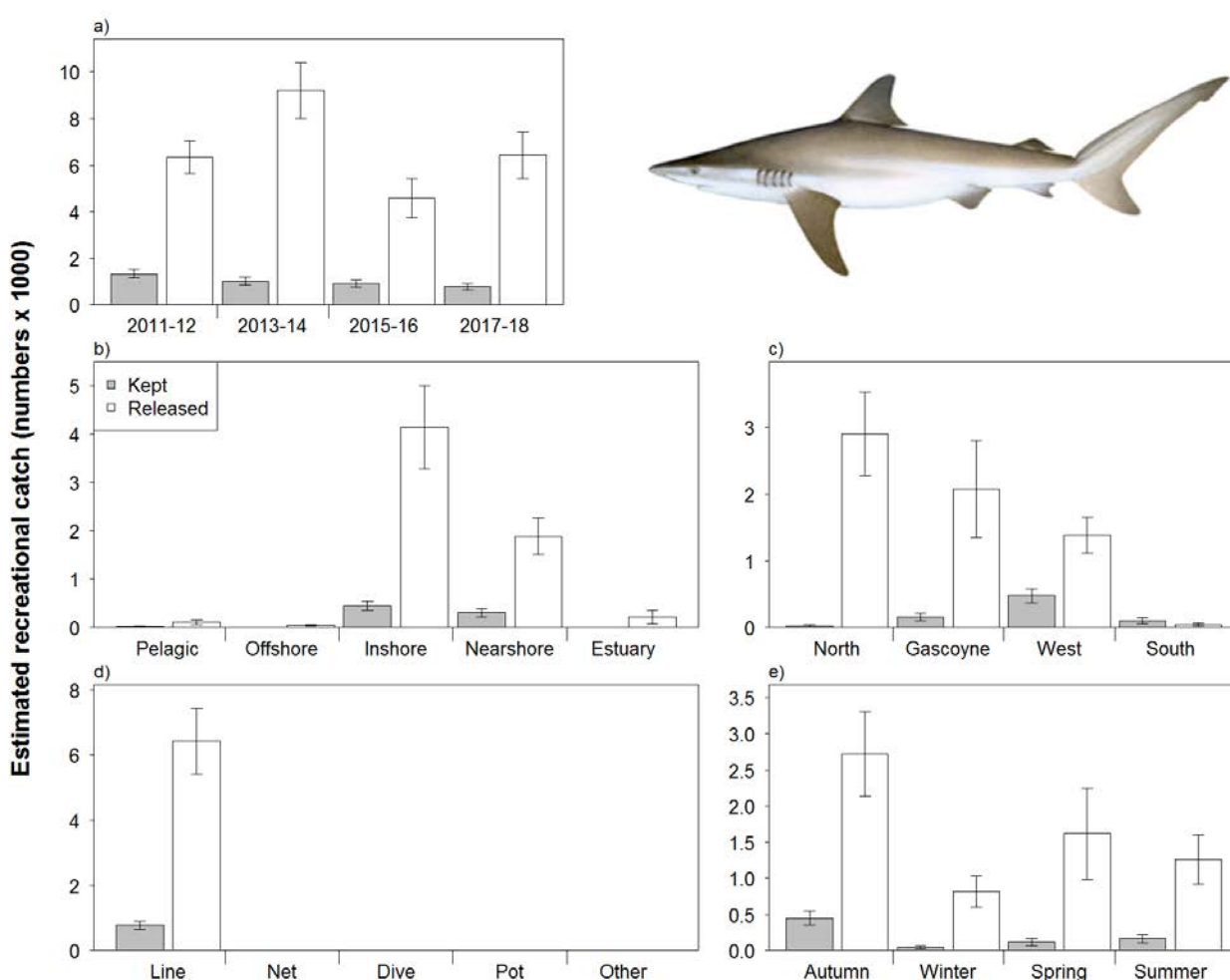
Most boat-based recreational catches of Port Jackson Shark occurred in the West Coast and South Coast (Figure 92c). All estimated catches were released (100%; Table 4, Figure 92a) and attributed to “Too Many” and “Other” (Table 6). Catches were taken from inshore demersal and nearshore (Figure 92b). Catches were mostly taken by line fishing (Figure 92d). Port Jackson Shark were harvested throughout the year, with higher catches in spring and summer compared with autumn and winter (Figure 92e). The estimated kept recreational catch of Port Jackson Shark in 2017/18 was similar to 2015/16; although the catch estimates for this species have high uncertainty (Figure 92a).



**Figure 92.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Port Jackson Shark in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.6.3 Whaler Sharks (Family Carcharhinidae)

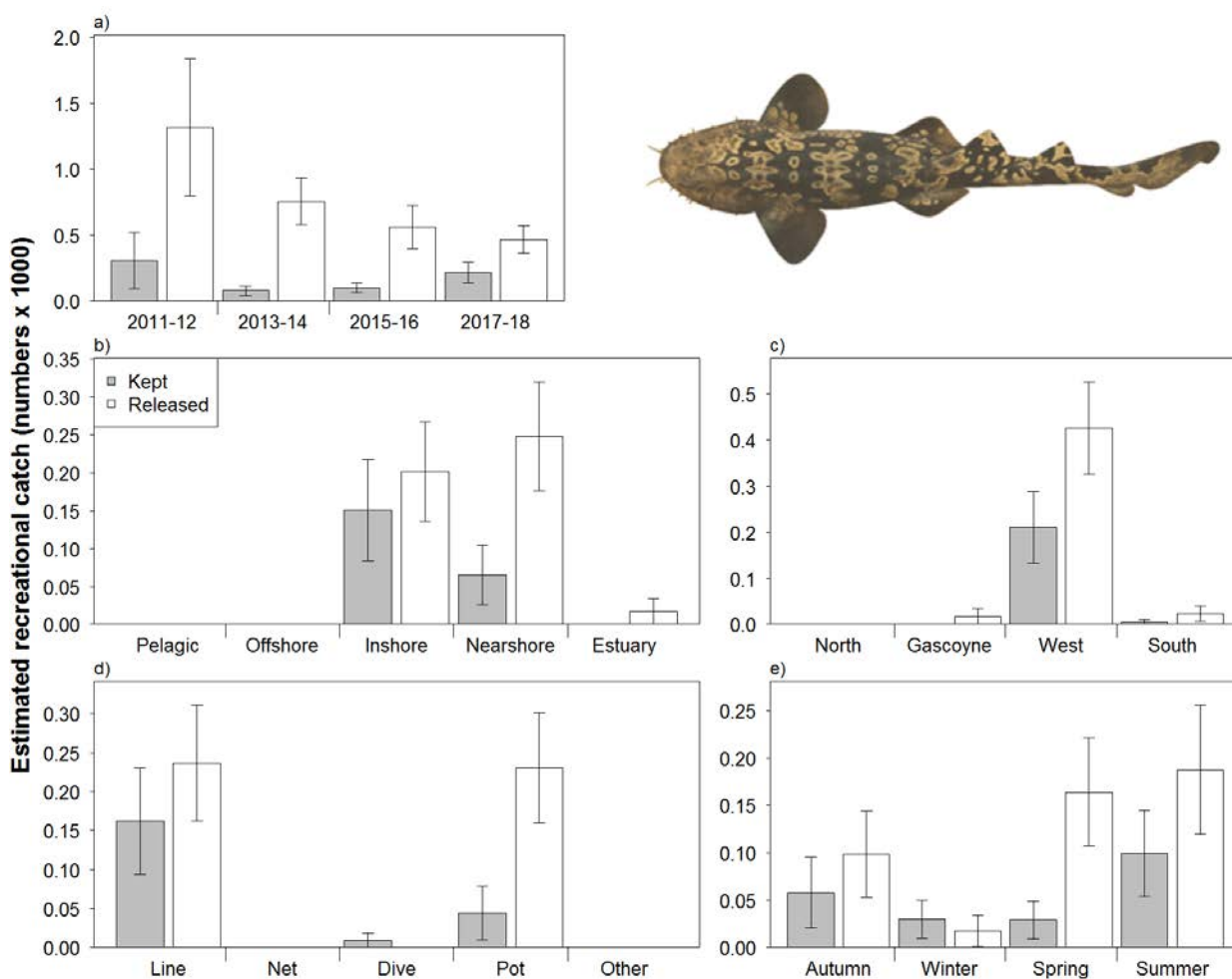
Whaler Sharks are a statewide indicator species. Whaler Sharks (Family Carcharhinidae) include Blacktip Reef Shark (*Carcharhinus melanopterus*), Bronze Whaler (*Carcharhinus brachyurus*), Dusky Whaler (*Carcharhinus obscurus*), Lemon Shark (*Negaprion acutidens*), Sandbar Shark (*Carcharhinus plumbeus*), Tiger Shark (*Galeocerdo cuvier*), Whitetip Reef Shark (*Triaenodon obesus*) and Other Whaler Sharks (Carcharhinidae - undifferentiated). Most boat-based recreational catches occurred in the North Coast, Gascoyne Coast and West Coast (Figure 93c). The majority of catches were released (71% or higher; Table 4, Figure 93a) and attributed to “Too Many” and “Other” (Table 6). Catches were mostly taken from inshore demersal (Figure 93d) by line fishing (Figure 93d). Catches occurred throughout the year, with higher catches in autumn (Figure 93e). The estimated kept recreational catch of Whaler Sharks in 2017/18 was similar with previous statewide surveys (Figure 93a).



**Figure 93.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Whaler Sharks in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

#### 6.6.4 Wobbegong (Family Orectolobidae)

Most boat-based recreational catches of Wobbegong occurred in the West Coast, with some catches in the South Coast (Figure 94c). The majority of catches were released (68%; Table 4, Figure 94a) and attributed to “Too Many” and “Other” (Table 6). Catches were taken predominantly from inshore demersal and nearshore (Figure 94b). Catches were mostly taken by line fishing, with some catches from potting (Figure 94d). Wobbegong were harvested throughout the year, with higher catches summer and autumn compared with winter and spring (Figure 94e). The estimated kept recreational catch of Wobbegong in 2017/18 was similar with previous statewide surveys (Figure 94a).

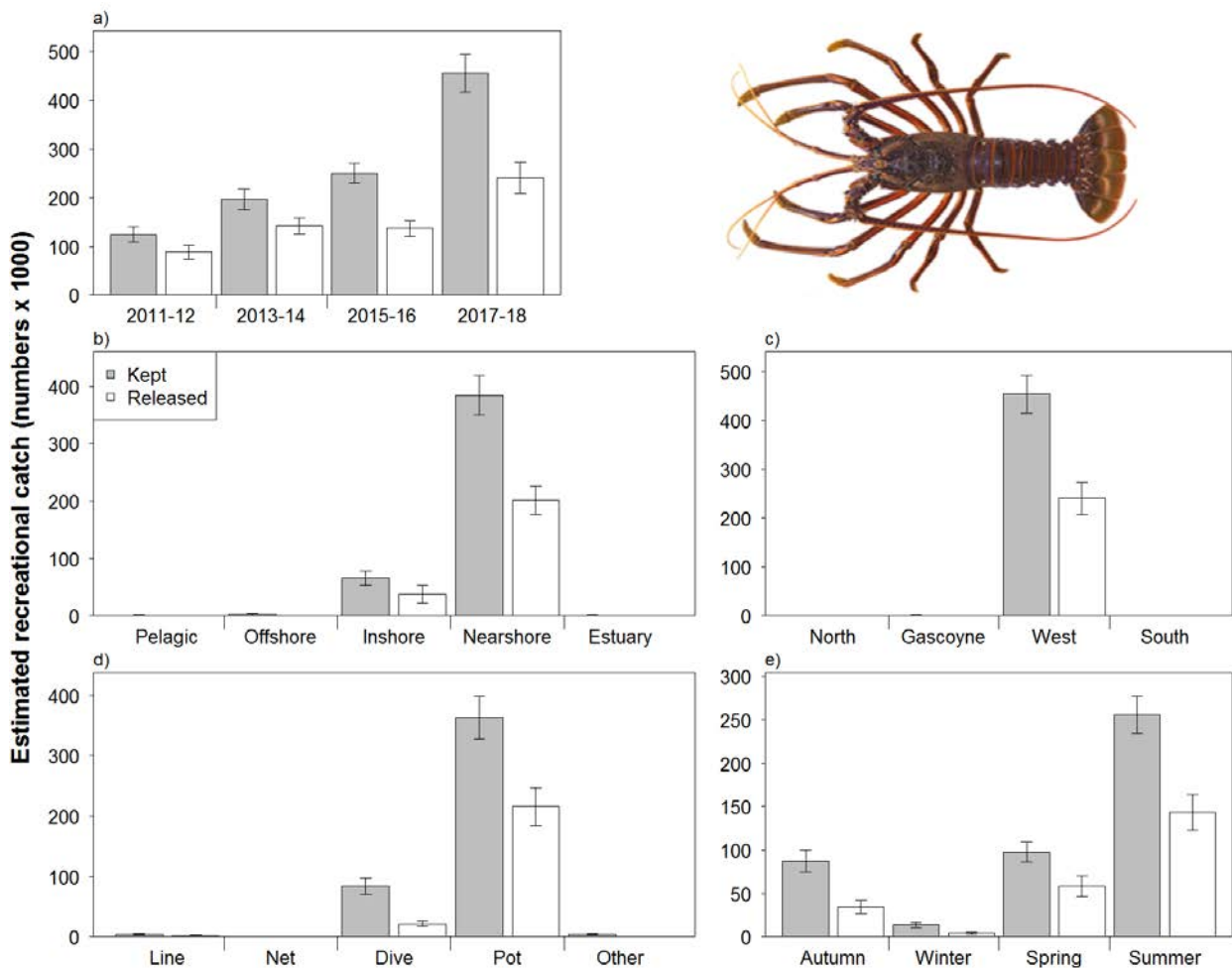


**Figure 94.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Wobbegong in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

## 6.7 Crustaceans

### 6.7.1 Western Rock Lobster (*Panulirus cygnus*)

The estimated catch from this survey does not account for catches from fishers that only have a Rock Lobster licence. Approximately 40% of Rock Lobster licence holders do not have a RBFL; therefore, these results underestimate the catch of Western Rock Lobster. Most boat-based recreational catches occurred in the West Coast (Figure 95c). The majority of catches were retained (35% released; Table 4, Figure 95a) with most releases attributed to “Under Size” (Table 6). Catches were taken predominantly from nearshore (Figure 95b). Catches were mostly taken by potting, followed by diving (Figure 95d). Rock Lobster were harvested mostly in summer, followed by spring and autumn (Figure 95e). The estimated kept and released recreational catches in 2017/18 were higher than previous statewide surveys (Figure 95a).

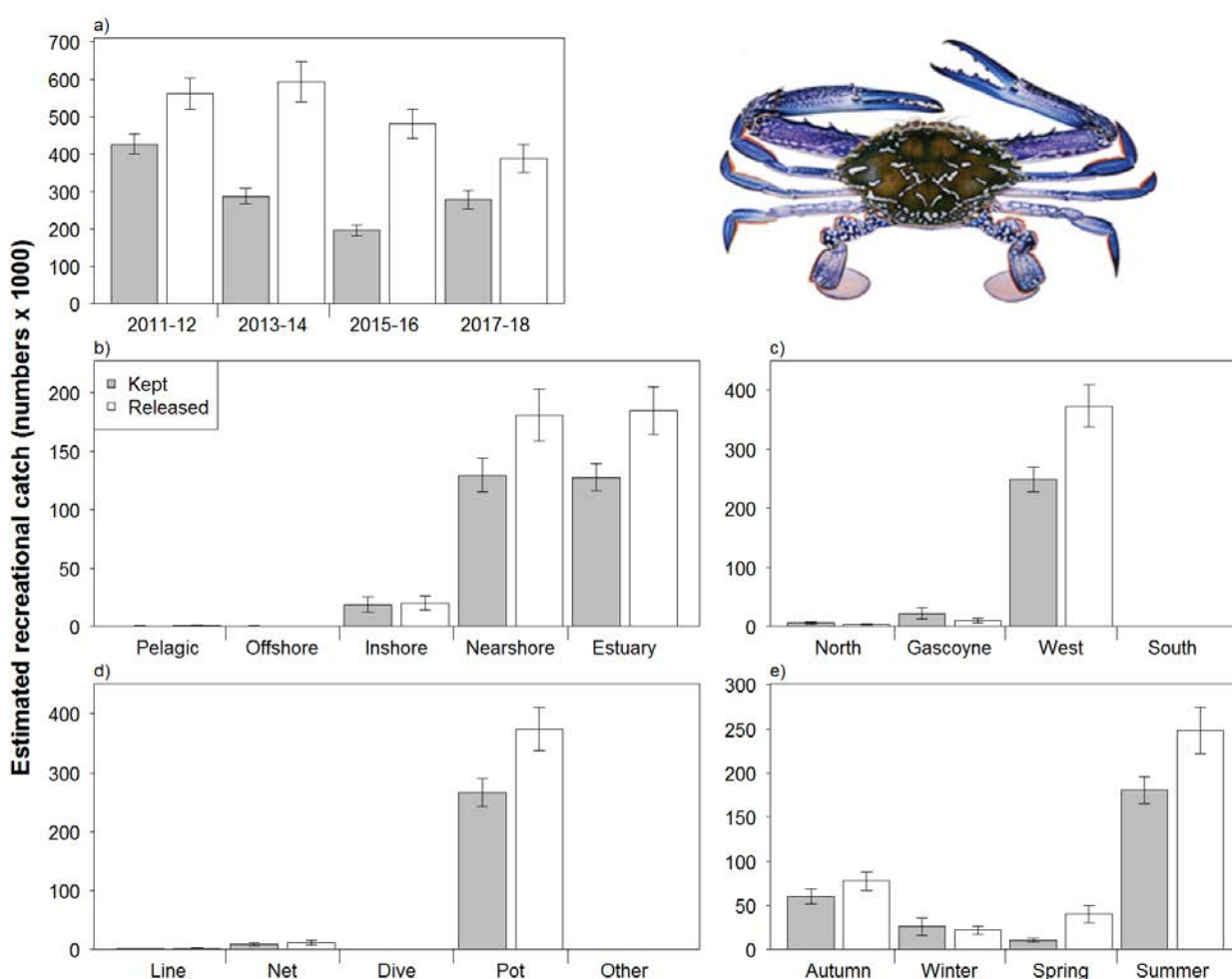


**Figure 95.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Western Rock Lobster in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.



### 6.7.2 Blue Swimmer Crab (*Portunus armatus*)

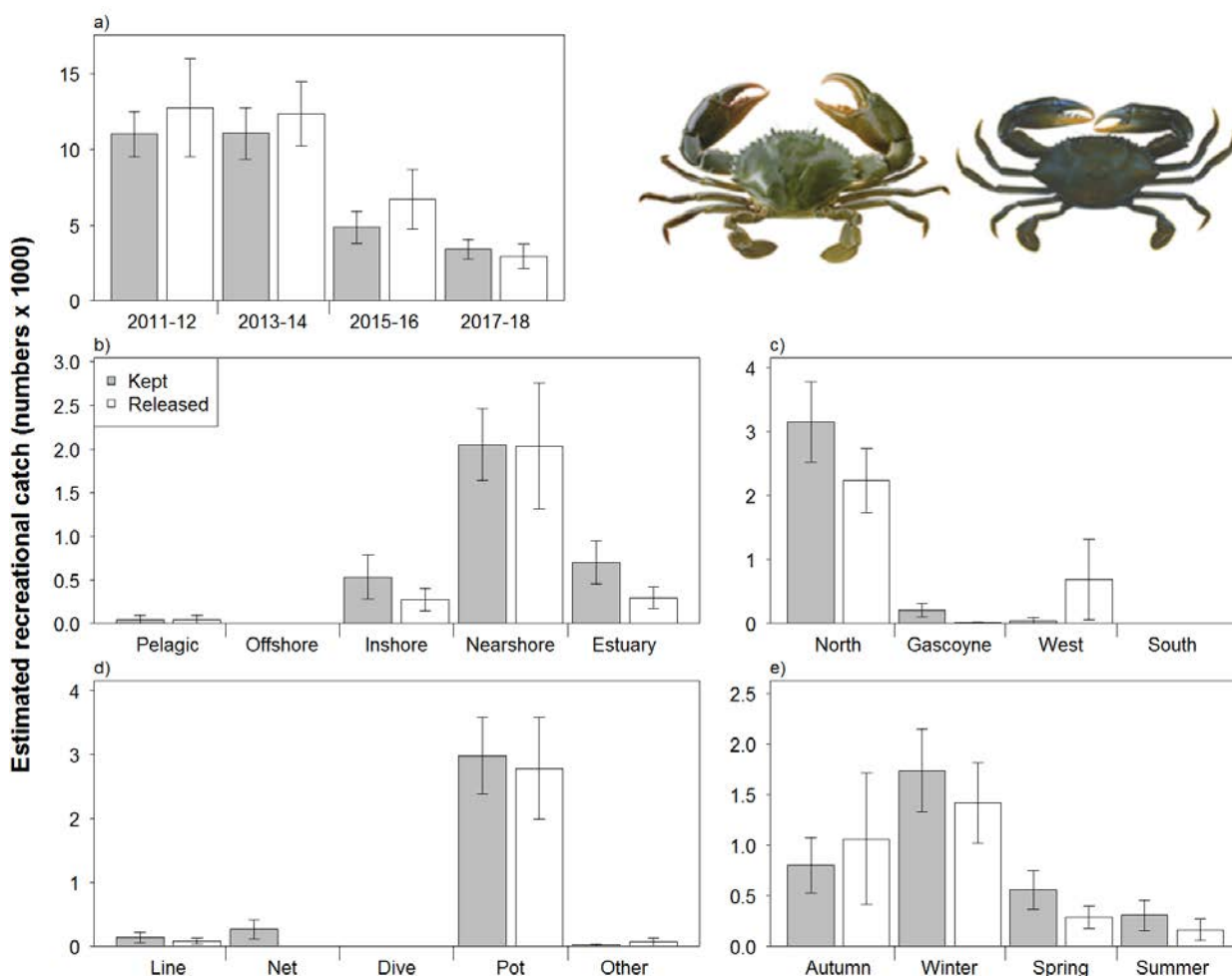
Blue Swimmer Crab, previously known as *Portunus pelagicus*, but now classified as *Portunus armatus*, is harvested statewide. Most boat-based recreational catches of Blue Swimmer Crab occurred in the West Coast, with some catches in the North Coast and Gascoyne Coast (Figure 96c). The majority of catches were released (58%; Table 4, Figure 96a) and attributed to “Under Size” (Table 6). Catches were taken predominantly from estuary and nearshore (Figure 96b). Most catches were taken by pots (including drop nets) (Figure 96d). Blue Swimmer Crab were harvested throughout the year, with higher catches in summer compared with autumn and spring (Figure 96e). The estimated kept recreational catch of Blue Swimmer Crab in 2017/18 was higher than 2015/16, although the estimated released recreational catch was lower (Figure 96a).



**Figure 96.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Blue Swimmer Crab in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.7.3 Mud Crab (*Scylla olivacea* and *S. serrata*).

Mud Crabs include Brown Mud Crab (*Scylla olivacea*) and Green Mud Crab (*S. serrata*). Most boat-based recreational catches of Mud Crab occurred in the North Coast (85%), with some catches in the West Coast (12%) and Gascoyne Coast (4%; Figure 97c). These proportions were similar to 2013/14 and 2011/12. There were different release rates for the two species (42% for Brown Mud Crab and 52% for Green Mud Crab; Table 4, Figure 97a) with most releases attributed to “Under Size” (Table 6). Catches were taken predominantly from nearshore and estuary (Figure 97b). Most catches were taken by pots (Figure 97d). Mud Crab were harvested throughout the year, with higher catches in autumn and winter compared with summer and spring (Figure 97e). The estimated kept and released recreational catches of Mud Crab in 2017/18 were similar to 2015/16, but lower than 2013/14 and 2011/12 (Figure 97a).



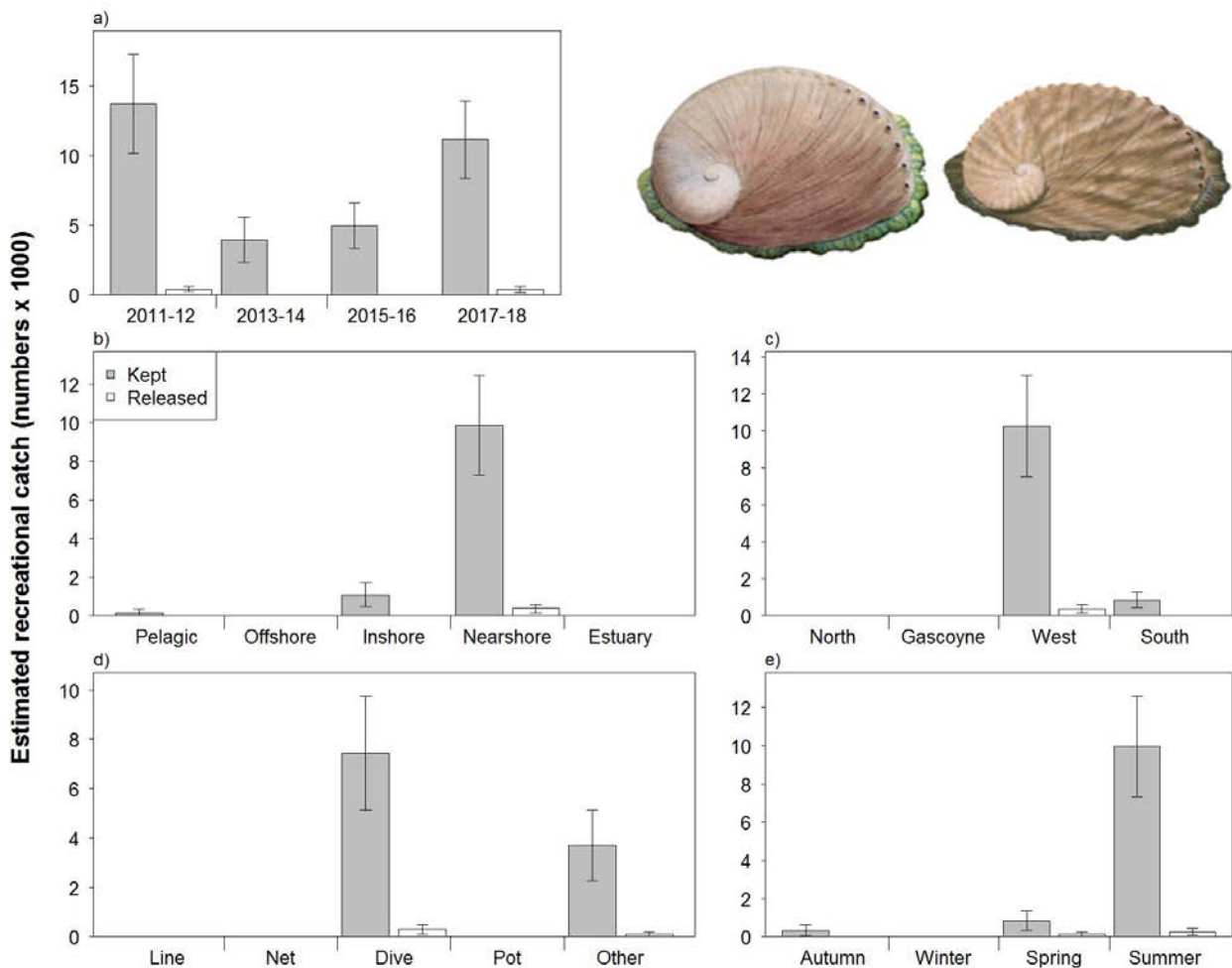
**Figure 97.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Mud Crab in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.



## 6.8 Molluscs

### 6.8.1 Abalone (*Haliotis* spp.)

Abalone includes Roe's Abalone (*Haliotis roei*), Greenlip Abalone (*H. laevigata*) and Brownlip Abalone (*H. conicopora*). Most boat-based recreational catches of Abalone occurred in the West Coast, with some catches in the South Coast (Figure 98c). The majority of catches were retained (3% released; Table 4, Figure 98a). Most catches were taken from nearshore (Figure 98b). Catches were mostly taken by diving (Figure 98d). Abalone were mostly harvested in summer compared with spring and autumn (Figure 98e). The estimated kept recreational catches of Abalone in 2017/18 was higher than 2015/16 and 2013/14, but similar with 2011/12, however, the catch estimates for this species have high uncertainty (Figure 98a). These estimates do not include catches from shore-based recreational fishing.

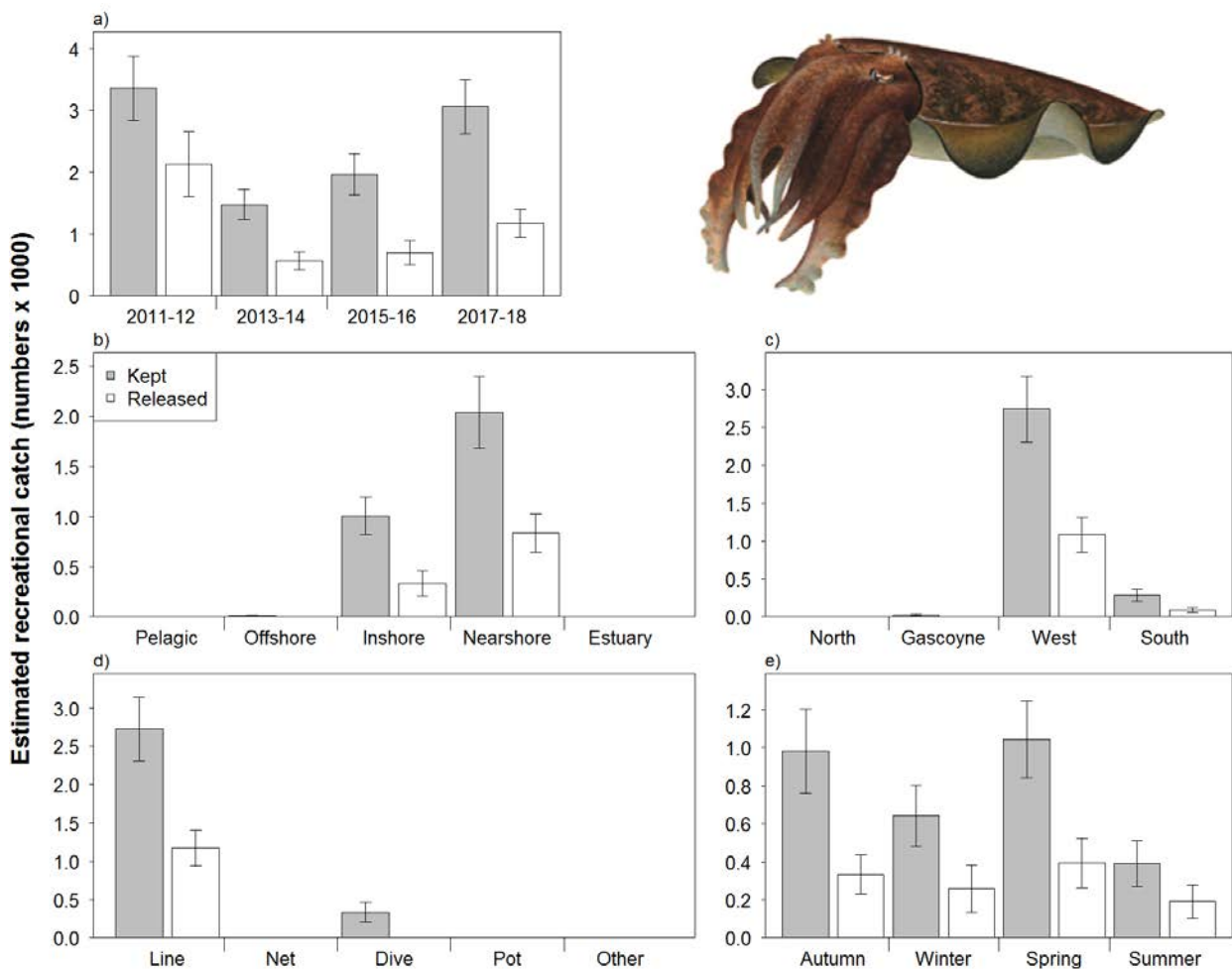


**Figure 98.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Abalone in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

## 6.9 Cephalopods

### 6.9.1 Cuttlefish (Order Sepiidae)

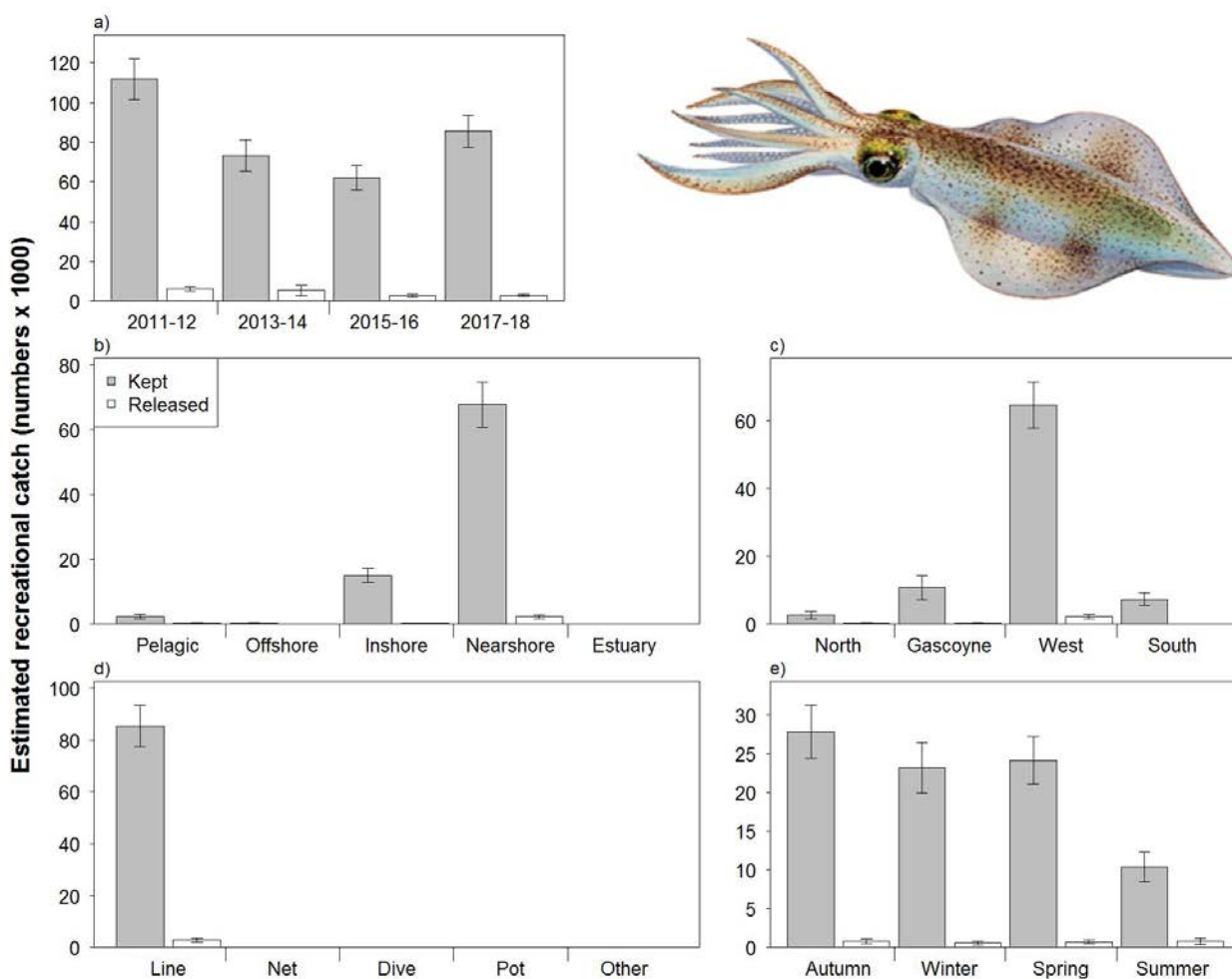
Most boat-based recreational catches of Cuttlefish occurred in the West Coast, with some catches in the South Coast (Figure 99c). The majority of catches were retained (28% released; Table 4, Figure 99a) with most releases attributed to “Too Many” and “Other” (Table 6). Catches were taken predominantly from nearshore and inshore demersal (Figure 99b). Catches were mostly taken by line fishing (Figure 99d). Cuttlefish were harvested throughout the year, with higher catches in autumn, winter and spring compared with summer (Figure 99e). The estimated kept recreational catch of Cuttlefish in 2017/18 was higher than 2015/16 and 2013/14, but similar with 2011/12 (Figure 99a).



**Figure 99.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Cuttlefish in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

## 6.9.2 Squid (Order Teuthoidea)

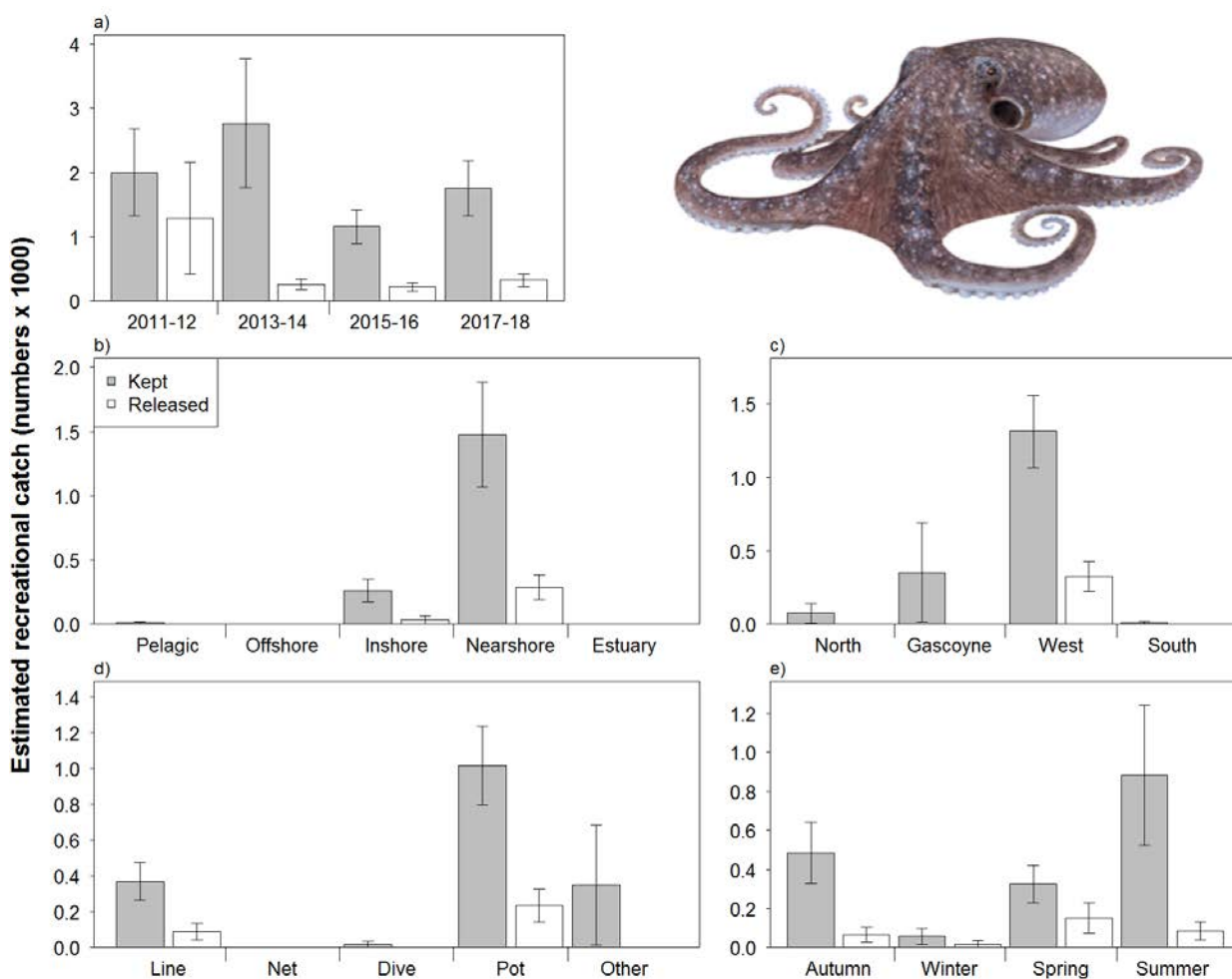
Most boat-based recreational catches of Squid occurred in the West Coast, with some catches in the Gascoyne Coast, South Coast and North Coast (Figure 100c). The majority of catches were retained (3% released; Table 4, Figure 100a) with most releases attributed to “Under Size” and “Too Small” (Table 6). Catches were taken predominantly from nearshore and inshore demersal (Figure 100b). Catches were mostly taken by line fishing (Figure 100d). Squid were harvested throughout the year, with higher catches in autumn, followed by winter, spring and summer (Figure 100e). The estimated kept and released recreational catches of Squid in 2017/18 were similar with previous statewide surveys (Figure 100a).



**Figure 100.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Squid in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

### 6.9.3 Octopus (Order Octopodidae)

Most boat-based recreational catches of Octopus occurred in the West Coast, with some catches in the Gascoyne Coast and North Coast (Figure 101c). The majority of catches were retained (16% released; Table 4, Figure 101a) with most releases attributed to “Too Many” and “Too Small” (Table 6). Catches were taken predominantly from nearshore (Figure 101b). Catches were mostly taken by potting, followed by other and line fishing (Figure 101d). Octopus were harvested throughout the year, with higher catches in summer compared with autumn, winter and spring (Figure 101e). The estimated kept recreational catch of Octopus in 2017/18 was similar with previous statewide surveys (Figure 101a, Table 5).



**Figure 101.** Boat-based kept (grey bars) and released (white bars) recreational catch (numbers x 1000 with standard error bars) of Octopus in Western Australia during 2017/18: a) compared with 3 previous surveys; b) catch by habitat; c) catch by bioregion; d) catch by method; and e) catch by season.

## 7 Estimates of Catch by Bioregion

This section presents estimates of boat-based recreational catch by bioregion for the 12-months from September 2017 to August 2018. Estimates are presented for annual catch (total, kept and released, by number) and proportions released (% released) for all species in each bioregion: North Coast (Table 7), Gascoyne Coast (Table 8), West Coast (Table 9) and South Coast (Table 10).

### 7.1 North Coast

A total of 134 species/taxa were reported in the North Coast in 2017/18, which represented 5.8% of the statewide total catch (by numbers). The most common finfish species were Grass Emperor (9% of the bioregion total catch), Stripey Snapper (8%), Red Emperor (6%), Coral Trout (5%), Saddletail Snapper (4%), Barramundi (4%), Spangled Emperor (3%), Rankin Cod (3%), Spanish Mackerel (3%), Blackspotted Rockcod (3%), Golden Trevally (2%), Blackspot Tuskfish (2%), Mangrove Jack (2%), Goldspotted Rockcod (2%), Crimson Snapper (2%), Golden Snapper (2%) and Blue Threadfin (2%). The most common invertebrate species were Blue Swimmer Crab (6%), Mud Crab (3%) and Squid (2%). These 20 species accounted for 73% of the total catch (by numbers) in the North Coast in 2017/18.

### 7.2 Gascoyne Coast

A total of 144 species/taxa were reported in the Gascoyne Coast in 2017/18, which represented 8.1% of the statewide total catch (by numbers). The most common finfish species were Pink Snapper (19% of the bioregion total catch), Grass Emperor (10%), Chinaman Rockcod (7%), Redthroat Emperor (6%), Spangled Emperor (5%), Red Emperor (2%), Goldband Snapper (2%) and Rankin Cod (2%). The most common invertebrate species were Blue Swimmer Crab (14%) and Squid (5%). These 10 species accounted for 72% of the total catch (by numbers) in the Gascoyne Coast in 2017/18.

### 7.3 West Coast

A total of 161 species/taxa were reported in the West Coast in 2017/18, which represented 79.6% of the statewide total catch (by numbers). The most common finfish species were School Whiting (11% of the bioregion total catch), Australian Herring (5%), West Australian Dhufish (3%), Pink Snapper (3%) and Silver Trevally (2%). The most common invertebrate species were Western Rock Lobster (31%), Blue Swimmer Crab (28%) and Squid (3%). These eight species accounted for 84% of the total catch (by numbers) in the West Coast in 2017/18.

### 7.4 South Coast

A total of 91 species/taxa were reported in the South Coast in 2017/18, which represented 6.5% of the statewide total catch (by numbers). The most common finfish species were King George Whiting (16% of the bioregion total catch), Black Bream (10%), School Whiting (10%), Australian Herring (9%), Bight Redfish (9%), Pink Snapper (6%), Breaksea Cod (5%), West Australian Dhufish (3%), Silver Trevally (2%), Swallowtail (2%), Blue Morwong (2%), Sea Sweep (2%), Southern Bluespotted Flathead (2%), Brownspotted Wrasse (2%) and Western King Wrasse (2%).

The most common invertebrate species were Squid (4%). These 16 species accounted for 84% of the total catch (by numbers) in the South Coast in 2017/18.

**Table 7.** Estimated annual catch (total, kept and released numbers) and proportion released in the North Coast bioregion during 2017/18 by RBFL holders aged five years or older (se is standard error; values in bold indicate relative standard error >40% (i.e. se >40% of estimate); values in italics indicate <30 respondents recorded catches of the species).

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Cephalopod	Octopus	<i>Octopus spp</i>	<b>77</b>	<b>68</b>	0	0	<b>77</b>	<b>68</b>	0%
Cephalopod	Squid	Order Teuthoidea - undifferentiated	<b>2,754</b>	<b>1,170</b>	<b>225</b>	<b>209</b>	<b>2,979</b>	<b>1,335</b>	8%
Lobster	Western Rock Lobster	<i>Panulirus cygnus</i>	<b>381</b>	<b>278</b>	0	0	<b>381</b>	<b>278</b>	0%
Lobster	Painted Rock Lobster	<i>Panulirus versicolor</i>	<b>1,133</b>	<b>606</b>	<b>70</b>	<b>67</b>	<b>1,203</b>	<b>613</b>	6%
Lobster	Ornate Rock Lobster	<i>Panulirus ornatus</i>	<b>258</b>	<b>107</b>	0	0	<b>258</b>	<b>107</b>	0%
Crab	Blue Swimmer Crab	<i>Portunus armatus</i>	6,522	1,981	4,031	1,380	10,553	3,108	38%
Crab	Green Mud Crab	<i>Scylla serrata</i>	1,230	359	741	208	1,971	521	38%
Crab	Brown Mud Crab	<i>Scylla olivacea</i>	1,924	447	1,494	414	3,418	736	44%
Sharks	Blacktip Reef Shark	<i>Carcharhinus melanopterus</i>	<b>7</b>	<b>6</b>	1,308	427	1,315	427	99%
Sharks	Dusky Whaler	<i>Carcharhinus obscurus</i>	0	0	671	203	671	203	100%
Sharks	Gummy Sharks	<i>Mustelus antarcticus</i> & <i>M stevensi</i>	0	0	<b>104</b>	<b>70</b>	<b>104</b>	<b>70</b>	100%
Sharks	Hammerhead Shark	Family Sphyrnidae	0	0	<b>15</b>	<b>9</b>	<b>15</b>	<b>9</b>	100%
Sharks	Lemon Shark	<i>Negaprion acutidens</i>	0	0	<b>103</b>	<b>48</b>	<b>103</b>	<b>48</b>	100%
Sharks	Tiger Shark	<i>Galeocerdo cuvier</i>	<b>7</b>	<b>6</b>	<b>177</b>	<b>112</b>	<b>185</b>	<b>113</b>	96%
Sharks	Whitetip Reef Shark	<i>Triaenodon obesus</i>	0	0	<b>602</b>	<b>353</b>	<b>602</b>	<b>353</b>	100%
Sharks	Other Whaler	Carcharhinidae - undifferentiated	<b>15</b>	<b>13</b>	<b>40</b>	<b>28</b>	<b>55</b>	<b>30</b>	73%
Sharks	Other Shark	Sharks - undifferentiated	<b>14</b>	<b>13</b>	701	220	715	221	98%
Rays	Sawfishes	Pristidae - undifferentiated	0	0	<b>57</b>	<b>34</b>	<b>57</b>	<b>34</b>	100%
Rays	Western Shovelnose Ray	<i>Aptychotrema vincentiana</i>	0	0	<b>12</b>	<b>8</b>	<b>12</b>	<b>8</b>	100%
Rays	Other Rays Skates	Rays - undifferentiated	0	0	45	17	45	17	100%
Billfish	Black Marlin	<i>Makaira indica</i>	<b>52</b>	<b>48</b>	<b>115</b>	<b>56</b>	<b>167</b>	<b>101</b>	69%
Billfish	Blue Marlin	<i>Makaira nigricans</i>	<b>21</b>	<b>20</b>	<b>13</b>	<b>12</b>	<b>34</b>	<b>23</b>	38%
Billfish	Sailfish	<i>Istiophorus platypterus</i>	<b>15</b>	<b>13</b>	664	242	679	245	98%
Bonito	Bonito	<i>Sarda spp</i>	<b>26</b>	<b>24</b>	0	0	<b>26</b>	<b>24</b>	0%
Bream	Northwest Black Bream	<i>Acanthopagrus palmaris</i>	<b>69</b>	<b>38</b>	<b>73</b>	<b>52</b>	<b>141</b>	<b>65</b>	51%
Bream	Pink Snapper	<i>Chrysophrys auratus</i>	<b>1,047</b>	<b>718</b>	<b>414</b>	<b>209</b>	<b>1,461</b>	<b>782</b>	28%
Bream	Western Yellowfin Bream	<i>Acanthopagrus morrisoni</i>	<b>431</b>	<b>232</b>	<b>268</b>	<b>163</b>	<b>699</b>	<b>356</b>	38%
Bream	Other Bream	Sparidae - undifferentiated	<b>5</b>	<b>4</b>	<b>26</b>	<b>24</b>	<b>31</b>	<b>24</b>	84%
Catfish	Eeltail Catfishes	Plotosidae - undifferentiated	<b>46</b>	<b>28</b>	<b>331</b>	<b>152</b>	<b>377</b>	<b>155</b>	88%
Catfish	Giant Sea Catfish	<i>Arius thalassinus</i>	<b>15</b>	<b>9</b>	2,080	444	2,094	445	99%
Catfish	Silver Cobbler	<i>Neoarius midgleyi</i>	0	0	<b>90</b>	<b>62</b>	<b>90</b>	<b>62</b>	100%

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Catfish	Other Catfish	Ariidae - undifferentiated	6	6	965	269	971	269	99%
Cobia	Cobia	<i>Rachycentron canadum</i>	438	86	278	91	715	147	39%
Cod	Barramundi Cod	<i>Cromileptes altivelis</i>	92	40	81	45	174	63	47%
Cod	Blackspotted Rockcod	<i>Epinephelus malabaricus</i>	1,146	527	3,109	1,181	4,255	1,629	73%
Cod	Blacktip Rockcod	<i>Epinephelus fasciatus</i>	19	18	64	34	82	38	77%
Cod	Chinaman Rockcod	<i>Epinephelus rivulatus</i>	395	100	1,497	485	1,893	497	79%
Cod	Frostback Rockcod	<i>Epinephelus bilobatus</i>	13	12	539	282	552	283	98%
Cod	Goldspotted Rockcod	<i>Epinephelus coioides</i>	832	218	2,284	506	3,116	601	73%
Cod	Potato Rockcod	<i>Epinephelus tukula</i>	0	0	19	18	19	18	100%
Cod	Queensland Grouper	<i>Epinephelus lanceolatus</i>	0	0	7	6	7	6	100%
Cod	Rankin Cod	<i>Epinephelus multinotatus</i>	3,663	878	1,946	551	5,608	1,196	35%
Cod	Temperate Basses & Rockcods	Epinephelidae - undifferentiated	7	6	62	36	69	37	89%
Cod	Tomato Rockcod	<i>Cephalopholis sonnerati</i>	52	50	55	36	107	85	51%
Cod	Yellowspotted Rockcod	<i>Epinephelus areolatus</i>	37	17	1,250	370	1,287	375	97%
Coral Trout	Coral Trout	<i>Plectropomus maculatus</i> & <i>P leopardus</i>	4,654	662	2,855	588	7,509	1,050	38%
Coral Trout	Yellowedge Coronation Trout	<i>Variola louti</i>	63	39	15	8	78	41	19%
Emperor	Bluespotted Emperor	<i>Lethrinus punctulatus</i>	274	131	1,656	587	1,930	623	86%
Emperor	Grass Emperor	<i>Lethrinus laticaudis</i>	5,772	1,349	9,405	2,680	15,176	3,688	62%
Emperor	Longnose Emperor	<i>Lethrinus olivaceus</i>	121	51	15	12	136	53	11%
Emperor	Redspot Emperor	<i>Lethrinus lentjan</i>	0	0	104	96	104	96	100%
Emperor	Redthroat Emperor	<i>Lethrinus miniatus</i>	307	132	633	241	939	295	67%
Emperor	Robinsons' Seabream	<i>Gymnocranius grandoculis</i>	9	9	22	19	31	21	70%
Emperor	Spangled Emperor	<i>Lethrinus nebulosus</i>	1,503	297	4,138	858	5,641	1,025	73%
Emperor	Yellowtail Emperor	<i>Lethrinus atkinsoni</i>	0	0	518	498	518	498	100%
Flathead	Northern Sand Flathead	<i>Platycephalus endrachtensis</i>	175	104	476	457	652	556	73%
Flathead	Yellowtail Flathead	<i>Platycephalus westraliae</i>	17	9	0	0	17	9	0%
Garfish	Three-by-two Garfish	<i>Hemiramphus robustus</i>	115	81	0	0	115	81	0%
Garfish	Other Garfish	Hemiramphidae - undifferentiated	0	0	384	370	384	370	100%
Giant Perch	Barramundi	<i>Lates calcarifer</i>	1,587	485	4,214	922	5,801	1,200	73%
Grunter	Western Sooty Grunter	<i>Hephaestus jenkinsi</i>	157	135	213	100	370	169	58%
Grunter Bream	Painted Sweetlips	<i>Diagramma labiosum</i>	276	139	567	368	843	418	67%
Grunter Bream	Barred Javelin	<i>Pomadasys kaakan</i>	217	93	498	278	715	362	70%
Grunter Bream	Blotched Javelin	<i>Pomadasys maculatus</i>	15	9	22	14	36	17	60%
Grunter Bream	Grunter Bream	Haemulidae - undifferentiated	7	6	152	134	160	140	95%
Jewfish	Black Jewfish	<i>Protonibea diacanthus</i>	234	85	265	89	500	143	53%



Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
King Snapper	Goldband Snapper	<i>Pristipomoides multidens</i>	806	588	401	210	1,206	693	33%
King Snapper	Rosy Snapper	<i>Pristipomoides filamentosus</i>	0	0	51	39	51	39	100%
Leatherjacket	Leatherjacket	Monacanthidae - undifferentiated	0	0	163	69	163	69	100%
Lizardfish	Lizardfish Grinners	Bathysauridae, Synodontidae - undifferentiated	0	0	143	91	143	91	100%
Longtom	Longtom	Belonidae - undifferentiated	0	0	92	53	92	53	100%
Mackerel	Grey Mackerel	<i>Scomberomorus semifasciatus</i>	458	175	358	202	815	330	44%
Mackerel	School Mackerel	<i>Scomberomorus queenslandicus</i>	139	63	146	47	285	87	51%
Mackerel	Shark Mackerel	<i>Grammatorcynus bicarinatus</i>	25	14	189	90	213	92	89%
Mackerel	Spanish Mackerel	<i>Scomberomorus commerson</i>	2,492	384	3,074	825	5,566	1,095	55%
Mackerel	Spotted Mackerel	<i>Scomberomorus munroi</i>	120	56	320	144	440	178	73%
Mackerel	Wahoo	<i>Acanthocybium solandri</i>	22	14	203	170	225	178	90%
Mackerel	Other Mackerel & Tuna	Scombridae - undifferentiated	64	49	117	71	181	98	65%
Mullet	Diamondscale Mullet	<i>Liza vaigiensis</i>	338	204	0	0	338	204	0%
Mullet	Greenback Mullet	<i>Liza subviridis</i>	160	140	37	24	197	162	19%
Mullet	Sea Mullet	<i>Mugil cephalus</i>	421	195	10	8	430	195	2%
Mullet	Other Mullet	Mugilidae - undifferentiated	194	108	116	102	310	194	37%
Pearl Perch	Northern Pearl Perch	<i>Glaucosoma buergeri</i>	47	20	121	70	167	87	72%
Pearl Perch	West Australian Dhufish	<i>Glaucosoma hebraicum</i>	9	8	29	25	38	27	77%
Pike	Great Barracuda	<i>Sphyraena barracuda</i>	0	0	397	201	397	201	100%
Pike	Yellowtail Barracuda	<i>Sphyraena obtusata</i>	17	16	157	135	174	136	90%
Queenfish	Queenfish	<i>Scomberoides spp</i>	158	54	925	287	1,083	305	85%
Sergeant Baker	Sergeant Baker	<i>Aulopus purpurissatus</i>	0	0	61	49	61	49	100%
Small Baitfish	Other Herring	Clupeidae - undifferentiated	181	159	691	602	872	623	79%
Threadfin	Blue Threadfin	<i>Eleutheronema tetradactylum</i>	1,404	319	1,306	407	2,710	576	48%
Threadfin	King Threadfin	<i>Polydactylus macrochir</i>	622	125	575	179	1,197	249	48%
Threadfin Bream	Rosy Threadfin Bream	<i>Nemipterus furcosus</i>	29	25	80	52	109	58	73%
Trevally	Amberjack	<i>Seriola dumerili</i>	0	0	35	23	35	23	100%
Trevally	Bludger Trevally	<i>Carangoides gymnostethus</i>	144	59	727	296	871	305	84%
Trevally	Giant Trevally	<i>Caranx ignobilis</i>	193	72	1,667	346	1,859	373	90%
Trevally	Golden Trevally	<i>Gnathanodon speciosus</i>	968	354	2,716	688	3,683	862	74%
Trevally	Rainbow Runner	<i>Elagatis bipinnulata</i>	26	24	0	0	26	24	0%
Trevally	Turrum	<i>Carangoides fulvoguttatus</i>	15	13	215	115	229	118	94%
Trevally	Other Trevally	Carangidae - undifferentiated	24	14	384	210	408	222	94%
Tripletail	Tripletail	<i>Lobotes surinamensis</i>	67	31	83	53	150	83	55%

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Tropical Snapper	Chinamanfish	<i>Symphorus nematophorus</i>	126	49	<b>208</b>	<b>93</b>	334	123	62%
Tropical Snapper	Crimson Snapper	<i>Lutjanus erythropterus</i>	1,025	314	1,966	744	2,991	974	66%
Tropical Snapper	Flame Snapper	<i>Etelis coruscens</i>	0	0	<b>78</b>	<b>61</b>	<b>78</b>	<b>61</b>	100%
Tropical Snapper	Golden Snapper	<i>Lutjanus johnii</i>	1,181	313	1,789	635	2,969	824	60%
Tropical Snapper	Mangrove Jack	<i>Lutjanus argentimaculatus</i>	1,575	383	1,781	655	3,357	885	53%
Tropical Snapper	Maori Snapper	<i>Lutjanus rivulatus</i>	<b>31</b>	<b>14</b>	<b>15</b>	<b>13</b>	<b>46</b>	<b>19</b>	32%
Tropical Snapper	Moses' Snapper	<i>Lutjanus russellii</i>	354	106	<b>523</b>	<b>248</b>	878	282	60%
Tropical Snapper	Red Emperor	<i>Lutjanus sebae</i>	4,269	812	5,590	1,001	9,859	1,642	57%
Tropical Snapper	Ruby Snapper	<i>Etelis carbunculus</i>	<b>31</b>	<b>20</b>	<b>31</b>	<b>20</b>	<b>62</b>	<b>40</b>	50%
Tropical Snapper	Saddletail Snapper	<i>Lutjanus malabaricus</i>	<b>3,472</b>	<b>1,636</b>	2,574	873	6,045	2,102	43%
Tropical Snapper	Stripey Snapper	<i>Lutjanus carponotatus</i>	3,542	739	9,481	1,888	13,023	2,412	73%
Tropical Snapper	Other Snapper	Lutjanidae - undifferentiated	<b>52</b>	<b>38</b>	<b>17</b>	<b>16</b>	<b>69</b>	<b>41</b>	25%
Tuna	Dogtooth Tuna	<i>Gymnosarda unicolor</i>	<b>13</b>	<b>13</b>	<b>182</b>	<b>168</b>	<b>194</b>	<b>169</b>	93%
Tuna	Longtail Tuna	<i>Thunnus orientalis</i>	<b>80</b>	<b>67</b>	<b>130</b>	<b>120</b>	<b>210</b>	<b>138</b>	62%
Tuna	Mackerel Tuna	<i>Euthynnus affinis</i>	306	100	539	185	844	222	64%
Tuna	Skipjack Tuna	<i>Katsuwonus pelamis</i>	<b>17</b>	<b>17</b>	0	0	<b>17</b>	<b>17</b>	0%
Tuna	Southern Bluefin Tuna	<i>Thunnus maccoyii</i>	<b>82</b>	<b>68</b>	0	0	<b>82</b>	<b>68</b>	0%
Tuna	Yellowfin Tuna	<i>Thunnus albacares</i>	<b>56</b>	<b>25</b>	<b>216</b>	<b>155</b>	<b>272</b>	<b>165</b>	80%
Tuskfish Wrasse	Baldchin Groper	<i>Choerodon rubescens</i>	<b>26</b>	<b>24</b>	<b>60</b>	<b>42</b>	<b>86</b>	<b>48</b>	70%
Tuskfish Wrasse	Blackspot Tuskfish	<i>Choerodon schoenleinii</i>	2,157	531	1,506	442	3,663	850	41%
Tuskfish Wrasse	Blue Tuskfish	<i>Choerodon cyanodus</i>	1,289	381	966	335	2,255	614	43%
Tuskfish Wrasse	Bluebarred Parrotfish	<i>Scarus ghobban spp complex</i>	<b>104</b>	<b>96</b>	0	0	<b>104</b>	<b>96</b>	0%
Tuskfish Wrasse	Bluespotted Tuskfish	<i>Choerodon cauteroma</i>	<b>174</b>	<b>126</b>	<b>73</b>	<b>45</b>	<b>247</b>	<b>133</b>	30%
Tuskfish Wrasse	Foxfish	<i>Bodianus frenchii</i>	<b>17</b>	<b>16</b>	0	0	<b>17</b>	<b>16</b>	0%
Tuskfish Wrasse	Goldspot Pigfish	<i>Bodianus perditio</i>	0	0	<b>13</b>	<b>12</b>	<b>13</b>	<b>12</b>	100%
Tuskfish Wrasse	Purple Tuskfish	<i>Choerodon cephalotes</i>	150	58	<b>58</b>	<b>36</b>	208	80	28%
Tuskfish Wrasse	Other Tuskfish	<i>Choerodon spp</i>	0	0	<b>107</b>	<b>60</b>	<b>107</b>	<b>60</b>	100%
Tuskfish Wrasse	Other Wrasse	Labridae - undifferentiated	<b>29</b>	<b>25</b>	<b>29</b>	<b>25</b>	<b>58</b>	<b>51</b>	50%
Whiting	Goldenline Whiting	<i>Sillago analis</i>	0	0	<b>7</b>	<b>6</b>	<b>7</b>	<b>6</b>	100%
Finfish Other	Other Eel	Order Anguilliformes - undifferentiated	<b>19</b>	<b>18</b>	<b>16</b>	<b>10</b>	<b>35</b>	<b>21</b>	46%
Finfish Other	Moonfish Batfish	Lampridae - undifferentiated	0	0	<b>212</b>	<b>117</b>	<b>212</b>	<b>117</b>	100%
Finfish Other	Oxeye Herring	<i>Megalops cyprinoides</i>	<b>7</b>	<b>6</b>	<b>65</b>	<b>57</b>	<b>73</b>	<b>64</b>	90%
Finfish Other	Silver Toadfish	<i>Lagocephalus sceleratus</i>	0	0	<b>25</b>	<b>15</b>	<b>25</b>	<b>15</b>	100%
Finfish Other	Other Toadfish	Tetraodontidae - undifferentiated	<b>13</b>	<b>12</b>	<b>36</b>	<b>19</b>	<b>49</b>	<b>23</b>	74%

**Table 8.** Estimated annual catch (total, kept and released numbers) and proportion released in the Gascoyne Coast bioregion during 2017/18 by RBFL holders aged five years or older (se is standard error; values in bold indicate relative standard error >40% (i.e. se >40% of estimate); values in italics indicate <30 respondents recorded catches of the species).

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Cephalopod	Cuttlefish	<i>Sepia spp</i>	<b>28</b>	<b>17</b>	0	0	<b>28</b>	<b>17</b>	0%
Cephalopod	Octopus	<i>Octopus spp</i>	<b>353</b>	<b>336</b>	0	0	<b>353</b>	<b>336</b>	0%
Cephalopod	Squid	Order Teuthoidea - undifferentiated	10,896	3,510	<b>310</b>	<b>200</b>	11,206	3,525	3%
Lobster	Western Rock Lobster	<i>Panulirus cygnus</i>	1,129	379	<b>142</b>	<b>64</b>	1,271	401	11%
Lobster	Painted Rock Lobster	<i>Panulirus versicolor</i>	<b>82</b>	<b>40</b>	<b>3</b>	<b>2</b>	<b>85</b>	<b>41</b>	4%
Lobster	Ornate Rock Lobster	<i>Panulirus ornatus</i>	253	84	<b>85</b>	<b>55</b>	338	122	25%
Crab	Blue Swimmer Crab	<i>Portunus armatus</i>	<b>22,340</b>	<b>9,599</b>	10,725	3,927	<b>33,065</b>	<b>13,411</b>	32%
Crab	Green Mud Crab	<i>Scylla serrata</i>	<b>48</b>	<b>37</b>	<b>10</b>	<b>5</b>	<b>58</b>	<b>41</b>	17%
Crab	Brown Mud Crab	<i>Scylla olivacea</i>	<b>169</b>	<b>97</b>	<b>10</b>	<b>7</b>	<b>179</b>	<b>98</b>	5%
Sharks	Blacktip Reef Shark	<i>Carcharhinus melanopterus</i>	<b>77</b>	<b>46</b>	118	47	194	66	60%
Sharks	Dusky Whaler	<i>Carcharhinus obscurus</i>	<b>66</b>	<b>28</b>	1,062	399	1,128	400	94%
Sharks	Grey nurse Shark	<i>Carcharias taurus</i>	0	0	<b>17</b>	<b>17</b>	<b>17</b>	<b>17</b>	100%
Sharks	Hammerhead Shark	Family Sphyrnidae	0	0	<b>19</b>	<b>18</b>	<b>19</b>	<b>18</b>	100%
Sharks	Lemon Shark	<i>Negaprion acutidens</i>	0	0	<b>93</b>	<b>89</b>	<b>93</b>	<b>89</b>	100%
Sharks	Tiger Shark	<i>Galeocerdo cuvier</i>	0	0	<b>674</b>	<b>593</b>	<b>674</b>	<b>593</b>	100%
Sharks	Whitetip Reef Shark	<i>Triaenodon obesus</i>	<b>19</b>	<b>18</b>	<b>127</b>	<b>59</b>	<b>145</b>	<b>67</b>	87%
Sharks	Wobbegong	Family Orectolobidae	0	0	<b>17</b>	<b>17</b>	<b>17</b>	<b>17</b>	100%
Sharks	Other Whaler	Carcharhinidae - undifferentiated	0	0	<b>6</b>	<b>5</b>	<b>6</b>	<b>5</b>	100%
Sharks	Other Shark	Sharks - undifferentiated	<b>35</b>	<b>19</b>	<b>669</b>	<b>269</b>	705	273	95%
Rays	Western Shovelnose Ray	<i>Aptychotrema vincentiana</i>	0	0	<b>21</b>	<b>14</b>	<b>21</b>	<b>14</b>	100%
Rays	Other Rays Skates	Rays - undifferentiated	0	0	<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>	100%
Billfish	Black Marlin	<i>Makaira indica</i>	<b>35</b>	<b>34</b>	<b>401</b>	<b>163</b>	436	173	92%
Billfish	Blue Marlin	<i>Makaira nigricans</i>	<b>15</b>	<b>8</b>	<b>702</b>	<b>322</b>	<b>717</b>	<b>323</b>	98%
Billfish	Sailfish	<i>Istiophorus platypterus</i>	0	0	228	90	228	90	100%
Billfish	Striped Marlin	<i>Tetrapturus audax</i>	0	0	<b>86</b>	<b>40</b>	<b>86</b>	<b>40</b>	100%
Bonito	Bonito	<i>Sarda spp</i>	<b>52</b>	<b>31</b>	<b>26</b>	<b>24</b>	<b>78</b>	<b>39</b>	33%
Bonito	Oriental Bonito	<i>Sarda orientalis</i>	<b>5</b>	<b>4</b>	<b>23</b>	<b>22</b>	<b>28</b>	<b>23</b>	83%
Bream	Frypan Bream	<i>Argyrops spinifer</i>	<b>69</b>	<b>32</b>	<b>8</b>	<b>4</b>	<b>77</b>	<b>32</b>	10%
Bream	Pink Snapper	<i>Chrysophrys auratus</i>	8,216	1,410	34,739	11,975	42,955	12,998	81%
Bream	Tarwhine	<i>Rhabdosargus sarba</i>	<b>5</b>	<b>4</b>	<b>38</b>	<b>30</b>	<b>43</b>	<b>30</b>	89%
Bream	Western Yellowfin Bream	<i>Acanthopagrus morrisoni</i>	<b>1,694</b>	<b>1,486</b>	<b>1,453</b>	<b>1,105</b>	<b>3,147</b>	<b>1,878</b>	46%
Catfish	Eeltail Catfishes	Plotosidae - undifferentiated	<b>208</b>	<b>188</b>	<b>334</b>	<b>227</b>	<b>542</b>	<b>409</b>	62%

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Catfish	Giant Sea Catfish	<i>Arius thalassinus</i>	0	0	189	91	189	91	100%
Catfish	Other Catfish	Ariidae - undifferentiated	0	0	110	79	110	79	100%
Cobia	Cobia	<i>Rachycentron canadum</i>	681	156	292	153	973	257	30%
Cod	Barramundi Cod	<i>Cromileptes altivelis</i>	42	24	0	0	42	24	0%
Cod	Blackspotted Rockcod	<i>Epinephelus malabaricus</i>	428	146	1,569	1,015	1,997	1,029	79%
Cod	Breaksea Cod	<i>Epinephelides armatus</i>	243	149	104	60	347	161	30%
Cod	Chinaman Rockcod	<i>Epinephelus rivulatus</i>	7,615	2,010	7,955	1,736	15,571	3,140	51%
Cod	Eightbar Grouper	<i>Hyporthodus octofasciatus</i>	202	88	0	0	202	88	0%
Cod	Frostback Rockcod	<i>Epinephelus bilobatus</i>	17	17	6	5	24	18	27%
Cod	Goldspotted Rockcod	<i>Epinephelus coioides</i>	1,079	254	1,689	477	2,768	611	61%
Cod	Potato Rockcod	<i>Epinephelus tukula</i>	19	18	2	1	21	18	9%
Cod	Rankin Cod	<i>Epinephelus multinotatus</i>	2,772	514	1,140	410	3,912	695	29%
Cod	Temperate Basses & Rockcods	Epinephelidae - undifferentiated	140	54	1,169	732	1,309	734	89%
Cod	Yellowspotted Rockcod	<i>Epinephelus areolatus</i>	372	171	342	111	714	207	48%
Coral Trout	Coral Trout	<i>Plectropomus maculatus</i> & <i>P leopardus</i>	1,802	339	1,117	394	2,919	575	38%
Coral Trout	Yellowedge Coronation Trout	<i>Variola louti</i>	112	47	47	28	159	56	30%
Emperor	Bluespotted Emperor	<i>Lethrinus punctulatus</i>	172	122	403	290	575	408	70%
Emperor	Grass Emperor	<i>Lethrinus laticaudis</i>	7,954	1,827	13,865	3,655	21,820	4,974	64%
Emperor	Longnose Emperor	<i>Lethrinus olivaceus</i>	202	136	139	119	341	252	41%
Emperor	Redspot Emperor	<i>Lethrinus lentjan</i>	10	7	10	7	19	10	50%
Emperor	Redthroat Emperor	<i>Lethrinus miniatus</i>	5,526	1,215	7,487	1,826	13,013	2,635	58%
Emperor	Robinsons' Seabream	<i>Gymnocranius grandoculis</i>	950	309	46	24	995	313	5%
Emperor	Spangled Emperor	<i>Lethrinus nebulosus</i>	6,119	1,004	6,356	1,261	12,474	2,084	51%
Emperor	Yellowtail Emperor	<i>Lethrinus atkinsoni</i>	75	71	86	54	161	89	54%
Flathead	Northern Sand Flathead	<i>Platycephalus endrachtensis</i>	98	42	54	38	152	58	35%
Flathead	Yellowtail Flathead	<i>Platycephalus westraliae</i>	71	33	38	30	109	45	35%
Flounder	Smalltooth Flounder	<i>Pseudorhombus jenynsii</i>	12	12	0	0	12	12	0%
Garfish	Southern Garfish	<i>Hyporhamphus melanochir</i>	345	267	0	0	345	267	0%
Garfish	Three-by-two Garfish	<i>Hemiramphus robustus</i>	908	669	82	75	991	677	8%
Grunter	Western Striped Grunter	<i>Pelates octolineatus</i>	0	0	162	86	162	86	100%
Grunter Bream	Painted Sweetlips	<i>Diagramma labiosum</i>	326	121	324	189	650	227	50%
Grunter Bream	Barred Javelin	<i>Pomadasys kaakan</i>	0	0	14	11	14	11	100%
Grunter Bream	Grunter Bream	Haemulidae - undifferentiated	0	0	192	185	192	185	100%
Jewfish	Mulloway	<i>Argyrosomus japonicus</i>	210	68	858	375	1,068	392	80%
King Snapper	Goldband Snapper	<i>Pristipomoides multidens</i>	3,070	957	1,167	419	4,237	1,292	28%

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
King Snapper	Rosy Snapper	<i>Pristipomoides filamentosus</i>	685	264	50	28	735	281	7%
King Snapper	Sharptooth Snapper	<i>Pristipomoides typus</i>	74	45	34	31	108	55	31%
Leatherjacket	Leatherjacket	Monacanthidae - undifferentiated	2	1	139	63	141	63	99%
Lizardfish	Lizardfish Grinners	Bathysauridae, Synodontidae - undifferentiated	84	48	297	131	381	152	78%
Longtom	Longtom	Belonidae - undifferentiated	24	13	358	193	382	193	94%
Mackerel	Blue Mackerel	<i>Scomber australasicus</i>	35	34	0	0	35	34	0%
Mackerel	Grey Mackerel	<i>Scomberomorus semifasciatus</i>	39	21	0	0	39	21	0%
Mackerel	School Mackerel	<i>Scomberomorus queenslandicus</i>	491	210	296	118	787	306	38%
Mackerel	Shark Mackerel	<i>Grammatorcynus bicarinatus</i>	341	136	324	101	665	169	49%
Mackerel	Spanish Mackerel	<i>Scomberomorus commerson</i>	1,954	368	1,199	286	3,153	565	38%
Mackerel	Spotted Mackerel	<i>Scomberomorus munroi</i>	142	61	332	239	475	248	70%
Mackerel	Wahoo	<i>Acanthocybium solandri</i>	182	57	29	20	212	60	14%
Mahi Mahi	Mahi Mahi	<i>Coryphaena spp</i>	134	55	433	371	567	375	76%
Mullet	Bluetail Mullet	<i>Valamugil buchanani</i>	156	133	0	0	156	133	0%
Mullet	Sea Mullet	<i>Mugil cephalus</i>	1,088	683	1,085	1,014	2,173	1,671	50%
Mullet	Other Mullet	Mugilidae - undifferentiated	112	102	3	2	116	102	3%
Pearl Perch	Northern Pearl Perch	<i>Glaucosoma buergeri</i>	423	101	114	64	537	127	21%
Pearl Perch	West Australian Dhufish	<i>Glaucosoma hebraicum</i>	7	7	12	11	19	13	61%
Pike	Great Barracuda	<i>Sphyraena barracuda</i>	23	18	167	56	190	63	88%
Pike	Yellowtail Barracuda	<i>Sphyraena obtusata</i>	35	34	85	38	120	51	71%
Queenfish	Queenfish	<i>Scomberoides spp</i>	41	19	474	256	515	257	92%
Sergeant Baker	Sergeant Baker	<i>Aulopus purpurissatus</i>	284	269	0	0	284	269	0%
Small Baitfish	Small Baitfish	Clupeidae, Engralidae & Atherinidae - undifferentiated	10	7	0	0	10	7	0%
Small Baitfish	Other Herring	Clupeidae - undifferentiated	0	0	8	4	8	4	100%
Sweep	Sea Sweep	<i>Scorpius aequipinnis</i>	12	12	0	0	12	12	0%
Tailor	Tailor	<i>Pomatomus saltatrix</i>	179	108	206	150	385	232	54%
Threadfin	Blue Threadfin	<i>Eleutheronema tetradactylum</i>	24	15	0	0	24	15	0%
Threadfin Bream	Rosy Threadfin Bream	<i>Nemipterus furcosus</i>	72	46	10	7	82	48	12%
Threadfin Bream	Western Butterfish	<i>Pentapodus vitta</i>	291	274	912	464	1,202	548	76%
Trevalla	Blue-Eye Trevalla	<i>Hyperoglyphe antarctica</i>	5	4	0	0	5	4	0%
Trevally	Amberjack	<i>Seriola dumerili</i>	10	5	29	18	39	18	74%
Trevally	Bludger Trevally	<i>Carangoides gymnostethus</i>	42	26	50	40	93	48	54%
Trevally	Common Dart	<i>Trachinotus botla</i>	0	0	803	773	803	773	100%
Trevally	Giant Trevally	<i>Caranx ignobilis</i>	244	155	1,366	980	1,609	995	85%

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Trevally	Golden Trevally	<i>Gnathanodon speciosus</i>	417	146	2,207	1,526	2,623	1,534	84%
Trevally	Rainbow Runner	<i>Elagatis bipinnulata</i>	3	2	0	0	3	2	0%
Trevally	Samsonfish	<i>Seriola hippos</i>	24	15	0	0	24	15	0%
Trevally	Silver Trevally	<i>Pseudocaranx georgianus spp complex</i>	484	271	201	104	685	324	29%
Trevally	Turrum	<i>Carangoides fulvoguttatus</i>	3	2	52	50	56	50	94%
Trevally	Other Trevally	Carangidae - undifferentiated	13	8	394	337	407	337	97%
Tropical Snapper	Brownstripe Snapper	<i>Lutjanus vitta</i>	5	4	0	0	5	4	0%
Tropical Snapper	Chinamanfish	<i>Symphorus nematophorus</i>	52	23	71	67	123	71	58%
Tropical Snapper	Crimson Snapper	<i>Lutjanus erythropterus</i>	150	74	189	96	339	135	56%
Tropical Snapper	Darktail Snapper	<i>Lutjanus lemniscatus</i>	8	4	0	0	8	4	0%
Tropical Snapper	Flame Snapper	<i>Etelis coruscens</i>	3	2	0	0	3	2	0%
Tropical Snapper	Mangrove Jack	<i>Lutjanus argentimaculatus</i>	366	128	382	149	748	255	51%
Tropical Snapper	Maori Snapper	<i>Lutjanus rivulatus</i>	5	4	0	0	5	4	0%
Tropical Snapper	Moses' Snapper	<i>Lutjanus russellii</i>	399	196	45	21	444	198	10%
Tropical Snapper	Red Emperor	<i>Lutjanus sebae</i>	3,113	654	2,352	688	5,466	1,046	43%
Tropical Snapper	Ruby Snapper	<i>Etelis carbunculus</i>	389	210	35	34	424	213	8%
Tropical Snapper	Saddletail Snapper	<i>Lutjanus malabaricus</i>	92	43	5	4	97	45	5%
Tropical Snapper	Stripey Snapper	<i>Lutjanus carponotatus</i>	1,530	329	1,536	307	3,066	484	50%
Tropical Snapper	Other Snapper	Lutjanidae - undifferentiated	84	35	215	127	298	136	72%
Tuna	Longtail Tuna	<i>Thunnus orientalis</i>	48	27	144	95	192	100	75%
Tuna	Mackerel Tuna	<i>Euthynnus affinis</i>	144	80	339	120	483	161	70%
Tuna	Skipjack Tuna	<i>Katsuwonus pelamis</i>	64	39	175	152	239	159	73%
Tuna	Southern Bluefin Tuna	<i>Thunnus maccoyii</i>	55	26	6	6	61	28	10%
Tuna	Yellowfin Tuna	<i>Thunnus albacares</i>	292	80	164	67	457	126	36%
Tuskfish Wrasse	Baldchin Groper	<i>Choerodon rubescens</i>	1,278	309	1,318	583	2,596	847	51%
Tuskfish Wrasse	Blackspot Tuskfish	<i>Choerodon schoenleinii</i>	1,016	280	563	335	1,579	535	36%
Tuskfish Wrasse	Blue Tuskfish	<i>Choerodon cyanodus</i>	677	229	296	105	973	274	30%
Tuskfish Wrasse	Bluebarred Parrotfish	<i>Scarus ghobban spp complex</i>	51	35	186	168	237	172	78%
Tuskfish Wrasse	Bluespotted Tuskfish	<i>Choerodon cauteroma</i>	66	30	172	127	238	135	72%
Tuskfish Wrasse	Brownspotted Wrasse	<i>Notolabrus parilus</i>	5	4	529	422	534	422	99%
Tuskfish Wrasse	Goldspot Pigfish	<i>Bodianus perditio</i>	168	51	69	38	236	70	29%
Tuskfish Wrasse	Purple Tuskfish	<i>Choerodon cephalotes</i>	46	26	58	38	104	46	56%
Tuskfish Wrasse	Western King Wrasse	<i>Coris auricularis</i>	0	0	144	102	144	102	100%
Tuskfish Wrasse	Other Parrotfish	Scaridae - undifferentiated	0	0	40	26	40	26	100%
Tuskfish Wrasse	Other Wrasse	Labridae - undifferentiated	0	0	41	26	41	26	100%

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Whiting	Goldenline Whiting	<i>Sillago analis</i>	<b>35</b>	<b>34</b>	<i>0</i>	<i>0</i>	<b>35</b>	<b>34</b>	0%
Whiting	School Whiting	<i>Sillago schomburgkii, bassensis &amp; vittata</i>	<i>1,932</i>	<i>703</i>	<b>470</b>	<b>242</b>	<i>2,402</i>	<i>895</i>	20%
Whiting	Western Trumpeter Whiting	<i>Sillago burrus</i>	<b>70</b>	<b>67</b>	<b>17</b>	<b>17</b>	<b>87</b>	<b>84</b>	20%
Wreckfish	Bass Groper	<i>Polyprion americanus</i>	<b>7</b>	<b>4</b>	<i>0</i>	<i>0</i>	<b>7</b>	<b>4</b>	0%
Finfish Other	Conger Eel	<i>Conger spp</i>	<i>0</i>	<i>0</i>	<b>5</b>	<b>4</b>	<b>5</b>	<b>4</b>	100%
Finfish Other	Silver Toadfish	<i>Lagocephalus sceleratus</i>	<b>26</b>	<b>24</b>	<b>166</b>	<b>85</b>	<b>192</b>	<b>102</b>	87%
Finfish Other	Weeping Toadfish	<i>Torquigener pleurogramma</i>	<i>0</i>	<i>0</i>	<b>340</b>	<b>154</b>	<b>340</b>	<b>154</b>	100%
Finfish Other	Other Toadfish	Tetraodontidae - undifferentiated	<b>12</b>	<b>11</b>	<b>159</b>	<b>110</b>	<b>171</b>	<b>111</b>	93%

**Table 9.** Estimated annual catch (total, kept and released numbers) and proportion released in the West Coast bioregion during 2017/18 by RBFL holders aged five years or older (se is standard error; values in bold indicate relative standard error >40% (i.e. se >40% of estimate); values in italics indicate <30 respondents recorded catches of the species).

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Abalone	Roe's Abalone	<i>Haliotis roei</i>	7,957	2,341	<b>269</b>	<b>185</b>	8,226	2,423	3%
Abalone	Greenlip Abalone	<i>Haliotis laevis</i>	<b>1,535</b>	<b>818</b>	<b>68</b>	<b>41</b>	<b>1,603</b>	<b>831</b>	4%
Abalone	Brownlip Abalone	<i>Haliotis conicopora</i>	<b>784</b>	<b>335</b>	<b>56</b>	<b>53</b>	<b>840</b>	<b>359</b>	7%
Cephalopod	Cuttlefish	<i>Sepia spp</i>	2,740	432	1,085	230	3,824	513	28%
Cephalopod	Octopus	<i>Octopus spp</i>	1,310	248	324	101	1,634	294	20%
Cephalopod	Squid	Order Teuthoidea - undifferentiated	64,508	6,816	2,305	613	66,813	7,126	3%
Lobster	Western Rock Lobster	<i>Panulirus cygnus</i>	453,475	38,344	240,267	31,951	693,742	64,221	35%
Lobster	Southern Rock Lobster	<i>Jasus edwardsii</i>	<b>5,130</b>	<b>2,336</b>	<b>3,904</b>	<b>2,084</b>	<b>9,035</b>	<b>4,355</b>	43%
Lobster	Painted Rock Lobster	<i>Panulirus versicolor</i>	0	0	<b>52</b>	<b>50</b>	<b>52</b>	<b>50</b>	100%
Crab	Blue Swimmer Crab	<i>Portunus armatus</i>	249,112	20,719	373,455	35,792	622,567	54,175	60%
Crab	Green Mud Crab	<i>Scylla serrata</i>	<b>52</b>	<b>50</b>	<b>690</b>	<b>624</b>	<b>743</b>	<b>630</b>	93%
Sharks	Blacktip Reef Shark	<i>Carcharhinus melanopterus</i>	<b>113</b>	<b>49</b>	<b>203</b>	<b>85</b>	315	105	64%
Sharks	Bronze Whaler	<i>Carcharhinus brachyurus</i>	342	91	996	245	1,338	267	74%
Sharks	Dusky Whaler	<i>Carcharhinus obscurus</i>	0	0	<b>54</b>	<b>30</b>	<b>54</b>	<b>30</b>	100%
Sharks	Grey Nurse Shark	<i>Carcharias taurus</i>	0	0	<b>52</b>	<b>50</b>	<b>52</b>	<b>50</b>	100%
Sharks	Gummy Sharks	<i>Mustelus antarcticus</i> & <i>M. stevensi</i>	821	185	657	145	1,478	249	44%
Sharks	Hammerhead Shark	Family Sphyrnidae	<b>19</b>	<b>18</b>	<b>34</b>	<b>21</b>	<b>53</b>	<b>28</b>	65%
Sharks	Lemon Shark	<i>Negaprion acutidens</i>	0	0	<b>17</b>	<b>13</b>	<b>17</b>	<b>13</b>	100%
Sharks	Port Jackson Shark	<i>Heterodontus portusjacksoni</i>	0	0	942	185	942	185	100%
Sharks	Sandbar Shark	<i>Carcharhinus plumbeus</i>	<b>27</b>	<b>20</b>	<b>14</b>	<b>13</b>	<b>42</b>	<b>24</b>	34%
Sharks	Tiger Shark	<i>Galeocerdo cuvier</i>	0	0	<b>82</b>	<b>35</b>	<b>82</b>	<b>35</b>	100%
Sharks	Whiskery Shark	<i>Furgaleus macki</i>	179	69	104	41	283	88	37%
Sharks	Wobbegong	Family Orectolobidae	211	78	426	100	637	138	67%
Sharks	Other Whaler	Carcharhinidae - undifferentiated	0	0	<b>25</b>	<b>24</b>	<b>25</b>	<b>24</b>	100%
Sharks	Other Shark	Sharks - undifferentiated	<b>124</b>	<b>55</b>	633	164	757	175	84%
Rays	Western Shovelnose Ray	<i>Aptychotrema vincentiana</i>	0	0	1,005	289	1,005	289	100%
Rays	Other Rays Skates	Rays - undifferentiated	<b>35</b>	<b>34</b>	2,468	411	2,503	412	99%
Barracouta	Barracouta	<i>Thyrstites atun</i>	0	0	<b>17</b>	<b>17</b>	<b>17</b>	<b>17</b>	100%
Billfish	Black Marlin	<i>Makaira indica</i>	0	0	<b>11</b>	<b>11</b>	<b>11</b>	<b>11</b>	100%
Billfish	Blue Marlin	<i>Makaira nigricans</i>	0	0	<b>94</b>	<b>71</b>	<b>94</b>	<b>71</b>	100%
Billfish	Striped Marlin	<i>Tetrapturus audax</i>	0	0	<b>44</b>	<b>42</b>	<b>44</b>	<b>42</b>	100%
Bonito	Bonito	<i>Sarda spp</i>	<b>116</b>	<b>66</b>	<b>105</b>	<b>101</b>	<b>220</b>	<b>121</b>	48%



Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Bream	Black Bream	<i>Acanthopagrus butcheri</i>	2,269	724	10,893	3,168	13,162	3,534	83%
Bream	Frypan Bream	<i>Argyrops spinifer</i>	<b>14</b>	<b>13</b>	<b>71</b>	<b>67</b>	<b>85</b>	<b>80</b>	83%
Bream	Pink Snapper	<i>Chrysophrys auratus</i>	17,618	1,436	43,829	3,909	61,446	4,922	71%
Bream	Tarwhine	<i>Rhabdosargus sarba</i>	1,213	473	3,529	1,098	4,742	1,233	74%
Bream	Other Bream	Sparidae - undifferentiated	<b>54</b>	<b>38</b>	<b>19</b>	<b>18</b>	<b>72</b>	<b>42</b>	26%
Catfish	Eeltail Catfishes	Plotosidae - undifferentiated	0	0	<b>35</b>	<b>34</b>	<b>35</b>	<b>34</b>	100%
Catfish	Estuary Cobbler	<i>Cnidogobius macrocephalus</i>	<b>102</b>	<b>71</b>	<b>85</b>	<b>59</b>	<b>187</b>	<b>123</b>	46%
Catfish	Giant Sea Catfish	<i>Arius thalassinus</i>	0	0	<b>327</b>	<b>176</b>	<b>327</b>	<b>176</b>	100%
Cobia	Cobia	<i>Rachycentron canadum</i>	<b>87</b>	<b>40</b>	<b>19</b>	<b>14</b>	106	42	18%
Cod	Blackspotted Rockcod	<i>Epinephelus malabaricus</i>	287	99	1,763	463	2,050	475	86%
Cod	Breaksea Cod	<i>Epinephelides armatus</i>	9,128	895	6,610	760	15,738	1,437	42%
Cod	Chinaman Rockcod	<i>Epinephelus rivulatus</i>	<b>1,951</b>	<b>1,019</b>	1,649	380	3,600	1,173	46%
Cod	Eightbar Grouper	<i>Hyporthodus octofasciatus</i>	<b>182</b>	<b>152</b>	<b>179</b>	<b>137</b>	<b>361</b>	<b>288</b>	50%
Cod	Goldspotted Rockcod	<i>Epinephelus coioides</i>	686	237	<b>772</b>	<b>310</b>	1,458	459	53%
Cod	Harlequin Fish	<i>Othos dentex</i>	1,943	293	<b>651</b>	<b>271</b>	2,594	499	25%
Cod	Queensland Grouper	<i>Epinephelus lanceolatus</i>	0	0	<b>12</b>	<b>11</b>	<b>12</b>	<b>11</b>	100%
Cod	Rankin Cod	<i>Epinephelus multinotatus</i>	<b>43</b>	<b>21</b>	<b>78</b>	<b>43</b>	<b>120</b>	<b>49</b>	65%
Cod	Temperate Basses & Rockcods	Epinephelidae - undifferentiated	239	92	<b>1,052</b>	<b>538</b>	<b>1,291</b>	<b>545</b>	81%
Coral Trout	Coral Trout	<i>Plectropomus maculatus</i> & <i>P leopardus</i>	1,640	433	<b>1,774</b>	<b>725</b>	3,413	1,132	52%
Coral Trout	Yellowedge Coronation Trout	<i>Variola louti</i>	<b>33</b>	<b>21</b>	0	0	<b>33</b>	<b>21</b>	0%
Emperor	Redthroat Emperor	<i>Lethrinus miniatus</i>	2,066	455	5,370	1,300	7,436	1,604	72%
Emperor	Robinsons' Seabream	<i>Gymnocranius grandoculis</i>	<b>12</b>	<b>12</b>	<b>155</b>	<b>105</b>	<b>167</b>	<b>105</b>	93%
Emperor	Spangled Emperor	<i>Lethrinus nebulosus</i>	669	155	1,717	601	2,386	667	72%
Emperor	Other Emperor	Lethrinidae - undifferentiated	378	137	<b>569</b>	<b>256</b>	947	355	60%
Flathead	Southern Bluespotted Flathead	<i>Platycephalus speculator</i>	2,899	760	11,001	1,817	13,899	2,215	79%
Flathead	Yellowtail Flathead	<i>Platycephalus westraliae</i>	814	195	8,830	1,878	9,644	1,949	92%
Flounder	Smalltooth Flounder	<i>Pseudorhombus jenynsii</i>	141	53	<b>46</b>	<b>35</b>	187	65	25%
Flounder	Other Flatfish	<i>Bothidae</i> & <i>Pleuronectidae</i> spp	<b>50</b>	<b>39</b>	<b>12</b>	<b>12</b>	<b>62</b>	<b>40</b>	20%
Garfish	Southern Garfish	<i>Hyporhamphus melanochir</i>	<b>125</b>	<b>57</b>	<b>1,815</b>	<b>923</b>	<b>1,940</b>	<b>925</b>	94%
Garfish	Three-by-two Garfish	<i>Hemiramphus robustus</i>	<b>319</b>	<b>202</b>	<b>175</b>	<b>168</b>	<b>494</b>	<b>284</b>	35%
Garfish	Other Garfish	Hemiramphidae - undifferentiated	<b>279</b>	<b>269</b>	<b>17</b>	<b>17</b>	<b>297</b>	<b>269</b>	6%
Giant Perch	Sand Bass	<i>Psammoperca waigiensis</i>	<b>81</b>	<b>46</b>	<b>127</b>	<b>77</b>	<b>208</b>	<b>89</b>	61%
Goatfish	Bluespotted Goatfish	<i>Upeneichthys vlamingii</i>	512	171	750	266	1,262	319	59%
Grunter	Sea Trumpeter	<i>Pelsartia humeralis</i>	<b>360</b>	<b>182</b>	4,070	1,201	4,430	1,217	92%
Grunter	Western Striped Grunter	<i>Pelates octolineatus</i>	<b>195</b>	<b>162</b>	3,301	889	3,496	919	94%

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Grunter	Other Trumpeter	<i>Latridopsis spp</i>	262	252	489	362	751	441	65%
Grunter Bream	Painted Sweetlips	<i>Diagramma labiosum</i>	490	162	308	115	798	211	39%
Gurnard	Bighead Gurnard Perch	<i>Neosebastes pandus</i>	151	84	1,818	381	1,969	392	92%
Gurnard	Gurnard	Neosebastidae - undifferentiated	224	117	2,084	356	2,308	376	90%
Jewfish	Mulloway	<i>Argyrosomus japonicus</i>	184	62	26	19	210	65	12%
King Snapper	Rosy Snapper	<i>Pristipomoides filamentosus</i>	0	0	110	101	110	101	100%
King Snapper	Sharptooth Snapper	<i>Pristipomoides typus</i>	0	0	56	55	56	55	100%
Leatherjacket	Horseshoe Leatherjacket	<i>Meuschenia hippocrepis</i>	105	48	515	394	620	397	83%
Leatherjacket	Sixspine Leatherjacket	<i>Meuschenia freycineti</i>	17	17	128	78	145	80	88%
Leatherjacket	Leatherjacket	Monacanthidae - undifferentiated	558	198	1,070	365	1,627	458	66%
Lizardfish	Lizardfish Grinners	Bathysauridae, Synodontidae - undifferentiated	0	0	148	94	148	94	100%
Longtom	Longtom	Belonidae - undifferentiated	9	9	0	0	9	9	0%
Mackerel	Blue Mackerel	<i>Scomber australasicus</i>	382	252	81	68	464	261	18%
Mackerel	Grey Mackerel	<i>Scomberomorus semifasciatus</i>	33	22	0	0	33	22	0%
Mackerel	School Mackerel	<i>Scomberomorus queenslandicus</i>	52	38	75	71	127	108	59%
Mackerel	Shark Mackerel	<i>Grammatorcynus bicarinatus</i>	56	29	38	22	94	37	40%
Mackerel	Spanish Mackerel	<i>Scomberomorus commerson</i>	775	233	72	33	847	238	9%
Mackerel	Spotted Mackerel	<i>Scomberomorus munroi</i>	11	11	0	0	11	11	0%
Mackerel	Other Mackerel & Tuna	Scombridae - undifferentiated	30	21	78	48	108	52	72%
Mahi Mahi	Mahi Mahi	<i>Coryphaena spp</i>	303	121	367	252	669	303	55%
Morwong	Blue Morwong	<i>Nemadactylus valenciennesi</i>	1,240	322	307	96	1,547	339	20%
Morwong	Dusky Morwong	<i>Dactylophora nigricans</i>	0	0	19	18	19	18	100%
Morwong	Other Morwong	Cheilodactylidae - undifferentiated	12	12	0	0	12	12	0%
Mullet	Sea Mullet	<i>Mugil cephalus</i>	5,977	4,921	112	91	6,089	4,922	2%
Mullet	Yelloweye Mullet	<i>Aldrichetta forsteri</i>	3,391	2,387	19	18	3,410	2,387	1%
Mullet	Other Mullet	Mugilidae - undifferentiated	788	768	0	0	788	768	0%
Pearl Perch	Northern Pearl Perch	<i>Glaucosoma buergeri</i>	11	11	0	0	11	11	0%
Pearl Perch	West Australian Dhufish	<i>Glaucosoma hebraicum</i>	25,627	1,898	37,441	4,426	63,068	5,842	59%
Pike	Snook	<i>Sphyraena novaehollandiae</i>	974	398	611	222	1,585	565	39%
Pike	Yellowtail Barracuda	<i>Sphyraena obtusata</i>	68	38	265	130	333	144	80%
Pike	Other Pike	Sphyraenidae - undifferentiated	200	132	169	105	368	169	46%
Redfish	Bight Redfish	<i>Centroberyx gerrardi</i>	800	181	264	105	1,065	241	25%
Redfish	Swallowtail	<i>Centroberyx lineatus</i>	186	66	298	167	484	193	62%
Redfish	Yelloweye Redfish	<i>Centroberyx australis</i>	17	17	0	0	17	17	0%

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Salmon Herring	Australian Herring	<i>Arripis georgianus</i>	82,746	9,998	19,883	2,599	102,628	11,289	19%
Salmon Herring	Western Australian Salmon	<i>Arripis truttaceus</i>	1,207	274	<b>2,068</b>	<b>925</b>	3,275	1,043	63%
Sergeant Baker	Sergeant Baker	<i>Aulopus purpurissatus</i>	1,250	311	3,674	559	4,925	691	75%
		Clupeidae, Engralidae & Atherinidae - undifferentiated	<b>170</b>	<b>161</b>	<b>0</b>	<b>0</b>	<b>170</b>	<b>161</b>	0%
Small Baitfish	Small Baitfish								
Sweep	Banded Sweep	<i>Scorpius georgiana</i>	269	99	743	266	1,012	284	73%
Sweep	Sea Sweep	<i>Scorpius aequipinnis</i>	520	141	999	254	1,519	307	66%
Sweep	Silver Drummer	<i>Kyphosus spp complex</i>	<b>19</b>	<b>18</b>	<b>57</b>	<b>54</b>	<b>75</b>	<b>56</b>	75%
Tailor	Tailor	<i>Pomatomus saltatrix</i>	5,084	1,357	8,372	2,859	13,456	3,664	62%
Threadfin Bream	Western Butterfish	<i>Pentapodus vitta</i>	3,596	1,176	13,999	3,119	17,595	3,490	80%
Trevalla	Blue-Eye Trevalla	<i>Hyperoglyphe antarctica</i>	<b>76</b>	<b>44</b>	<b>300</b>	<b>293</b>	<b>376</b>	<b>296</b>	80%
Trevally	Amberjack	<i>Seriola dumerili</i>	<b>82</b>	<b>41</b>	<b>119</b>	<b>83</b>	<b>202</b>	<b>93</b>	59%
Trevally	Common Dart	<i>Trachinotus botla</i>	<b>17</b>	<b>17</b>	<b>35</b>	<b>24</b>	<b>52</b>	<b>38</b>	67%
Trevally	Giant Trevally	<i>Caranx ignobilis</i>	<b>25</b>	<b>18</b>	<b>96</b>	<b>71</b>	<b>120</b>	<b>74</b>	80%
Trevally	Golden Trevally	<i>Gnathanodon speciosus</i>	<b>700</b>	<b>413</b>	<b>113</b>	<b>110</b>	<b>813</b>	<b>497</b>	14%
Trevally	Samsonfish	<i>Seriola hippos</i>	1,261	212	5,592	979	6,853	1,047	82%
Trevally	Silver Trevally	<i>Pseudocaranx georgianus spp complex</i>	22,879	3,168	18,146	3,817	41,024	6,496	44%
Trevally	Turrun	<i>Carangoides fulvoguttatus</i>	<b>35</b>	<b>34</b>	<b>70</b>	<b>67</b>	<b>105</b>	<b>101</b>	67%
Trevally	Yellowtail Kingfish	<i>Seriola lalandi</i>	824	237	<b>1,002</b>	<b>608</b>	1,827	664	55%
Trevally	Yellowtail Scad	<i>Trachurus novaezelandiae</i>	<b>751</b>	<b>535</b>	<b>192</b>	<b>169</b>	<b>943</b>	<b>575</b>	20%
Trevally	Other Trevally	Carangidae - undifferentiated	<b>119</b>	<b>56</b>	<b>12</b>	<b>11</b>	<b>130</b>	<b>58</b>	9%
Tripletail	Tripletail	<i>Lobotes surinamensis</i>	<b>12</b>	<b>11</b>	<b>17</b>	<b>17</b>	<b>29</b>	<b>20</b>	60%
Tropical Snapper	Brownstripe Snapper	<i>Lutjanus vitta</i>	<b>0</b>	<b>0</b>	<b>14</b>	<b>13</b>	<b>14</b>	<b>13</b>	100%
Tropical Snapper	Crimson Snapper	<i>Lutjanus erythropterus</i>	<b>126</b>	<b>51</b>	<b>26</b>	<b>18</b>	151	60	17%
Tropical Snapper	Darktail Snapper	<i>Lutjanus lemniscatus</i>	<b>300</b>	<b>293</b>	<b>0</b>	<b>0</b>	<b>300</b>	<b>293</b>	0%
Tropical Snapper	Flame Snapper	<i>Etelis coruscens</i>	<b>0</b>	<b>0</b>	<b>122</b>	<b>118</b>	<b>122</b>	<b>118</b>	100%
Tropical Snapper	Red Emperor	<i>Lutjanus sebae</i>	527	126	<b>497</b>	<b>377</b>	<b>1,024</b>	<b>439</b>	48%
Tropical Snapper	Stripey Snapper	<i>Lutjanus carponotatus</i>	<b>60</b>	<b>47</b>	<b>283</b>	<b>126</b>	<b>344</b>	<b>165</b>	82%
Tropical Snapper	Other Snapper	Lutjanidae - undifferentiated	<b>61</b>	<b>29</b>	<b>165</b>	<b>111</b>	<b>226</b>	<b>115</b>	73%
Tuna	Longtail Tuna	<i>Thunnus orientalis</i>	<b>19</b>	<b>18</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>18</b>	0%
Tuna	Mackerel Tuna	<i>Euthynnus affinis</i>	<b>126</b>	<b>55</b>	<b>152</b>	<b>119</b>	<b>279</b>	<b>134</b>	55%
Tuna	Skipjack Tuna	<i>Katsuwonus pelamis</i>	<b>367</b>	<b>189</b>	<b>70</b>	<b>67</b>	<b>437</b>	<b>212</b>	16%
Tuna	Southern Bluefin Tuna	<i>Thunnus maccoyii</i>	1,463	531	784	260	2,247	679	35%
Tuna	Yellowfin Tuna	<i>Thunnus albacares</i>	258	94	<b>136</b>	<b>88</b>	394	136	35%
Tuskfish Wrasse	Baldchin Groper	<i>Choerodon rubescens</i>	15,288	1,510	7,683	952	22,971	2,184	33%

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Tuskfish Wrasse	Bluebarred Parrotfish	<i>Scarus ghobban spp complex</i>	<b>1,289</b>	<b>931</b>	1,169	454	<b>2,458</b>	<b>1,036</b>	48%
Tuskfish Wrasse	Bluespotted Tuskfish	<i>Choerodon cauteroma</i>	<b>19</b>	<b>18</b>	<b>11</b>	<b>11</b>	<b>30</b>	<b>21</b>	37%
Tuskfish Wrasse	Brownspeckled Wrasse	<i>Notolabrus parilus</i>	3,493	1,103	18,969	3,070	22,462	3,827	84%
Tuskfish Wrasse	Foxfish	<i>Bodianus frenchii</i>	1,201	239	1,029	256	2,230	390	46%
Tuskfish Wrasse	Southern Maori Wrasse	<i>Ophthalmolepis lineolatus</i>	805	317	2,775	991	3,580	1,084	78%
Tuskfish Wrasse	Western Blue Groper	<i>Achoerodus gouldii</i>	<b>518</b>	<b>191</b>	<b>187</b>	<b>136</b>	<b>705</b>	<b>315</b>	27%
Tuskfish Wrasse	Western King Wrasse	<i>Coris auricularis</i>	5,154	1,042	27,192	3,391	32,346	3,839	84%
Tuskfish Wrasse	Other Parrotfish	Scaridae - undifferentiated	<b>172</b>	<b>126</b>	1,778	625	1,950	641	91%
Tuskfish Wrasse	Other Tuskfish	<i>Choerodon spp</i>	<b>37</b>	<b>36</b>	0	0	<b>37</b>	<b>36</b>	0%
Tuskfish Wrasse	Other Wrasse	Labridae - undifferentiated	0	0	<b>2,661</b>	<b>1,253</b>	<b>2,661</b>	<b>1,253</b>	100%
Western Blue Devil	Western Blue Devil	<i>Paraplesiops sinclairi</i>	<b>6</b>	<b>5</b>	363	103	369	103	98%
Whiting	King George Whiting	<i>Sillaginodes punctata</i>	19,221	3,069	4,470	1,158	23,690	3,727	19%
Whiting	School Whiting	<i>Sillago schomburgkii, bassensis &amp; vittata</i>	179,034	24,562	60,448	17,690	239,482	36,505	25%
Whiting	Western Trumpeter Whiting	<i>Sillago burrus</i>	<b>1,469</b>	<b>852</b>	2,927	1,052	4,396	1,442	67%
Whiting	Other Whiting	Sillaginidae - undifferentiated	<b>1,362</b>	<b>820</b>	<b>515</b>	<b>313</b>	<b>1,876</b>	<b>1,114</b>	27%
Wreckfish	Bass Groper	<i>Polyprion americanus</i>	<b>119</b>	<b>71</b>	<b>19</b>	<b>18</b>	<b>138</b>	<b>73</b>	14%
Wreckfish	Hapuku	<i>Polyprion oxygeneios</i>	<b>192</b>	<b>113</b>	<b>19</b>	<b>18</b>	<b>211</b>	<b>115</b>	9%
Finfish Other	Dory	Zeidae - undifferentiated	<b>49</b>	<b>27</b>	0	0	<b>49</b>	<b>27</b>	0%
Finfish Other	Conger Eel	<i>Conger spp</i>	0	0	<b>21</b>	<b>17</b>	<b>21</b>	<b>17</b>	100%
Finfish Other	Other Eel	Order Anguilliformes - undifferentiated	<b>38</b>	<b>28</b>	279	81	317	86	88%
Finfish Other	Silver Toadfish	<i>Lagocephalus sceleratus</i>	<b>25</b>	<b>24</b>	1,904	631	1,929	632	99%
Finfish Other	Weeping Toadfish	<i>Torquigener pleurogramma</i>	<b>314</b>	<b>302</b>	5,251	1,274	5,565	1,309	94%
Finfish Other	Other Toadfish	Tetraodontidae - undifferentiated	<b>12</b>	<b>11</b>	4,137	1,338	4,148	1,338	100%
Finfish Other	Other Boxfish	Ostraciidae - undifferentiated	<b>7</b>	<b>7</b>	0	0	<b>7</b>	<b>7</b>	0%
Finfish Other	Other Boarfish	Pentacerotidae - undifferentiated	<b>146</b>	<b>82</b>	0	0	<b>146</b>	<b>82</b>	0%

**Table 10.** Estimated annual catch (total, kept and released numbers) and proportion released in the South Coast bioregion during 2017/18 by RBFL holders aged five years or older (se is standard error; values in bold indicate relative standard error >40% (i.e. se >40% of estimate); values in italics indicate <30 respondents recorded catches of the species).

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Abalone	Roe's Abalone	<i>Haliotis roei</i>	<b>740</b>	<b>404</b>	0	0	<b>740</b>	<b>404</b>	0%
Abalone	Greenlip Abalone	<i>Haliotis laevis</i>	<b>121</b>	<b>101</b>	0	0	<b>121</b>	<b>101</b>	0%
Cephalopod	Cuttlefish	<i>Sepia spp</i>	291	78	91	28	382	84	24%
Cephalopod	Octopus	<i>Octopus spp</i>	<b>11</b>	<b>10</b>	0	0	<b>11</b>	<b>10</b>	0%
Cephalopod	Squid	Order Teuthoidea - undifferentiated	7,407	1,834	114	36	7,521	1,841	2%
Lobster	Western Rock Lobster	<i>Panulirus cygnus</i>	<b>40</b>	<b>34</b>	0	0	<b>40</b>	<b>34</b>	0%
Lobster	Southern Rock Lobster	<i>Jasus edwardsii</i>	<b>10</b>	<b>8</b>	0	0	<b>10</b>	<b>8</b>	0%
Crab	Blue Swimmer Crab	<i>Portunus armatus</i>	<b>326</b>	<b>148</b>	<b>16</b>	<b>11</b>	<b>342</b>	<b>154</b>	5%
Sharks	Bronze Whaler	<i>Carcharhinus brachyurus</i>	<b>87</b>	<b>40</b>	<b>33</b>	<b>18</b>	119	45	27%
Sharks	Gummy Sharks	<i>Mustelus antarcticus</i> & <i>M. stevensi</i>	101	39	<b>10</b>	<b>6</b>	111	40	9%
Sharks	Hammerhead Shark	Family Sphyrnidae	0	0	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	100%
Sharks	Port Jackson Shark	<i>Heterodontus portusjacksoni</i>	<b>3</b>	<b>3</b>	<b>272</b>	<b>207</b>	<b>275</b>	<b>207</b>	99%
Sharks	Whiskery Shark	<i>Furgaleus macki</i>	<b>24</b>	<b>16</b>	0	0	<b>24</b>	<b>16</b>	0%
Sharks	Wobbegong	Family Orectolobidae	<b>6</b>	<b>5</b>	<b>24</b>	<b>16</b>	<b>29</b>	<b>16</b>	81%
Sharks	Other Whaler	Carcharhinidae - undifferentiated	<b>19</b>	<b>18</b>	<b>15</b>	<b>13</b>	<b>33</b>	<b>22</b>	44%
Sharks	Other Shark	Sharks - undifferentiated	<b>10</b>	<b>8</b>	<b>350</b>	<b>196</b>	<b>360</b>	<b>196</b>	97%
Rays	Other Rays Skates	Rays - undifferentiated	<b>11</b>	<b>10</b>	<b>67</b>	<b>31</b>	<b>79</b>	<b>32</b>	86%
Billfish	Blue Marlin	<i>Makaira nigricans</i>	<b>15</b>	<b>13</b>	0	0	<b>15</b>	<b>13</b>	0%
Bonito	Bonito	<i>Sarda spp</i>	<b>31</b>	<b>15</b>	0	0	<b>31</b>	<b>15</b>	0%
Bream	Black Bream	<i>Acanthopagrus butcheri</i>	4,137	1,246	14,300	3,965	18,437	4,992	78%
Bream	Pink Snapper	<i>Chrysophrys auratus</i>	4,009	887	6,219	1,476	10,228	1,888	61%
Bream	Tarwhine	<i>Rhabdosargus sarba</i>	<b>82</b>	<b>54</b>	<b>325</b>	<b>269</b>	<b>407</b>	<b>307</b>	80%
Bream	Other Bream	Sparidae - undifferentiated	<b>11</b>	<b>10</b>	0	0	<b>11</b>	<b>10</b>	0%
Catfish	Estuary Cobbler	<i>Cnidogobius macrocephalus</i>	<b>46</b>	<b>35</b>	0	0	<b>46</b>	<b>35</b>	0%
Catfish	Other Catfish	Ariidae - undifferentiated	<b>12</b>	<b>12</b>	0	0	<b>12</b>	<b>12</b>	0%
Cod	Breaksea Cod	<i>Epinephelides armatus</i>	6,521	847	2,865	558	9,385	1,278	31%
Cod	Eightbar Grouper	<i>Hyporthodus octofasciatus</i>	<b>22</b>	<b>20</b>	0	0	<b>22</b>	<b>20</b>	0%
Cod	Harlequin Fish	<i>Othos dentex</i>	1,010	221	<b>43</b>	<b>20</b>	1,053	228	4%
Cod	Temperate Basses & Rockcods	Epinephelidae - undifferentiated	<b>38</b>	<b>27</b>	<b>238</b>	<b>117</b>	<b>275</b>	<b>126</b>	86%
Emperor	Other Emperor	Lethrinidae - undifferentiated	<b>113</b>	<b>69</b>	<b>77</b>	<b>75</b>	<b>191</b>	<b>141</b>	41%
Flathead	Southern Bluespotted Flathead	<i>Platycephalus speculator</i>	793	221	<b>2,324</b>	<b>1,551</b>	<b>3,117</b>	<b>1,587</b>	75%
Flounder	Smalltooth Flounder	<i>Pseudorhombus jenynsii</i>	<b>21</b>	<b>14</b>	<b>22</b>	<b>21</b>	<b>43</b>	<b>32</b>	51%

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Garfish	Southern Garfish	<i>Hyporhamphus melanochir</i>	326	143	112	78	438	174	26%
Giant Perch	Sand Bass	<i>Psammoperca waigiensis</i>	5	4	0	0	5	4	0%
Goatfish	Bluespotted Goatfish	<i>Upeneichthys vlamingii</i>	114	77	611	209	725	224	84%
Grunter	Sea Trumpeter	<i>Pelsartia humeralis</i>	0	0	2,098	793	2,098	793	100%
Grunter	Western Striped Grunter	<i>Pelates octolineatus</i>	0	0	143	86	143	86	100%
Grunter	Other Trumpeter	<i>Latridopsis spp</i>	0	0	247	128	247	128	100%
Gurnard	Bighead Gurnard Perch	<i>Neosebastes pandus</i>	27	19	783	617	810	617	97%
Gurnard	Gurnard	Neosebastidae - undifferentiated	15	13	158	80	173	82	92%
Jewfish	Mulloway	<i>Argyrosomus japonicus</i>	0	0	17	17	17	17	100%
Leatherjacket	Horseshoe Leatherjacket	<i>Meuschenia hippocrepis</i>	129	62	866	516	995	520	87%
Leatherjacket	Sixspine Leatherjacket	<i>Meuschenia freycineti</i>	206	137	22	20	228	139	10%
Leatherjacket	Leatherjacket	Monacanthidae - undifferentiated	118	44	1,857	616	1,975	620	94%
Mackerel	Blue Mackerel	<i>Scomber australasicus</i>	540	271	79	62	618	278	13%
Mackerel	Other Mackerel & Tuna	Scombridae - undifferentiated	699	615	34	23	733	615	5%
Morwong	Blue Morwong	<i>Nemadactylus valenciennesi</i>	3,095	461	568	172	3,663	554	16%
Mullet	Sea Mullet	<i>Mugil cephalus</i>	540	492	0	0	540	492	0%
Mullet	Yelloweye Mullet	<i>Aldrichetta forsteri</i>	487	469	19	18	506	470	4%
Mullet	Other Mullet	Mugilidae - undifferentiated	0	0	87	84	87	84	100%
Pearl Perch	West Australian Dhufish	<i>Glaucosoma hebraicum</i>	2,281	384	2,437	693	4,718	1,013	52%
Pike	Snook	<i>Sphyraena novaehollandiae</i>	207	67	599	513	806	556	74%
Pike	Yellowtail Barracuda	<i>Sphyraena obtusata</i>	144	128	21	13	165	129	13%
Pike	Other Pike	Sphyraenidae - undifferentiated	51	41	0	0	51	41	0%
Redfish	Bight Redfish	<i>Centroberyx gerrardi</i>	11,409	1,677	4,460	1,129	15,869	2,534	28%
Redfish	Swallowtail	<i>Centroberyx lineatus</i>	2,364	433	1,622	342	3,986	688	41%
Salmon Herring	Australian Herring	<i>Arripis georgianus</i>	12,245	2,004	4,672	1,083	16,917	2,832	28%
Salmon Herring	Western Australian Salmon	<i>Arripis truttaceus</i>	510	207	1,238	568	1,748	705	71%
Sergeant Baker	Sergeant Baker	<i>Aulopus purpurissatus</i>	523	126	1,669	336	2,192	421	76%
Sweep	Banded Sweep	<i>Scorpis georgiana</i>	335	202	260	111	595	238	44%
Sweep	Sea Sweep	<i>Scorpis aequipinnis</i>	1,959	415	1,224	274	3,184	565	38%
Sweep	Silver Drummer	<i>Kyphosus spp complex</i>	13	8	25	15	38	17	66%
Tailor	Tailor	<i>Pomatomus saltatrix</i>	164	151	34	23	198	153	17%
Trevally	Samsonfish	<i>Seriola hippos</i>	433	96	776	325	1,209	349	64%
Trevally	Silver Trevally	<i>Pseudocaranx georgianus spp complex</i>	2,193	490	2,011	485	4,204	880	48%
Trevally	Yellowtail Kingfish	<i>Seriola lalandi</i>	278	97	355	196	633	232	56%
Trevally	Yellowtail Scad	<i>Trachurus novaezealandiae</i>	780	508	855	538	1,635	739	52%

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Trevally	Other Trevally	Carangidae - undifferentiated	520	197	70	47	590	240	12%
Tropical Snapper	Other Snapper	Lutjanidae - undifferentiated	84	71	22	20	107	74	21%
Tuna	Skipjack Tuna	<i>Katsuwonus pelamis</i>	11	10	0	0	11	10	0%
Tuna	Southern Bluefin Tuna	<i>Thunnus maccoyii</i>	222	70	82	46	304	94	27%
Tuskfish Wrasse	Baldchin Groper	<i>Choerodon rubescens</i>	16	11	0	0	16	11	0%
Tuskfish Wrasse	Brownspeckled Wrasse	<i>Notolabrus parilus</i>	301	111	2,787	565	3,088	612	90%
Tuskfish Wrasse	Foxfish	<i>Bodianus frenchii</i>	253	77	93	31	346	83	27%
Tuskfish Wrasse	Southern Maori Wrasse	<i>Ophthalmolepis lineolatus</i>	15	10	829	328	844	331	98%
Tuskfish Wrasse	Western Blue Groper	<i>Achoerodus gouldii</i>	185	63	22	15	208	64	11%
Tuskfish Wrasse	Western King Wrasse	<i>Coris auricularis</i>	191	66	2,732	690	2,923	716	93%
Tuskfish Wrasse	Other Parrotfish	Scaridae - undifferentiated	171	135	313	174	484	262	65%
Tuskfish Wrasse	Other Wrasse	Labridae - undifferentiated	11	10	559	251	570	251	98%
Western Blue Devil	Western Blue Devil	<i>Paraplesiops sinclairi</i>	29	13	209	80	238	81	88%
Whiting	King George Whiting	<i>Sillaginodes punctata</i>	23,018	6,076	5,941	1,348	28,959	6,937	21%
Whiting	School Whiting	<i>Sillago schomburgkii, bassensis &amp; vittata</i>	15,374	7,957	2,100	737	17,475	8,124	12%
Whiting	Other Whiting	Sillaginidae - undifferentiated	0	0	113	55	113	55	100%
Wreckfish	Bass Groper	<i>Polyprion americanus</i>	2	2	0	0	2	2	0%
Wreckfish	Hapuku	<i>Polyprion oxygeneios</i>	395	158	7	7	403	161	2%
Finfish Other	Butterfish	Stromateidae - undifferentiated	0	0	34	23	34	23	100%
Finfish Other	Dory	Zeidae - undifferentiated	9	9	0	0	9	9	0%
Finfish Other	Conger Eel	<i>Conger spp</i>	0	0	7	7	7	7	100%
Finfish Other	Other Eel	Order Anguilliformes - undifferentiated	0	0	2	2	2	2	100%
Finfish Other	Weeping Toadfish	<i>Torquigener pleurogramma</i>	0	0	45	41	45	41	100%
Finfish Other	Other Boarfish	Pentacerotidae - undifferentiated	10	8	0	0	10	8	0%

## 8 Estimates of Catch by Zones within Bioregions

This section presents estimates of boat-based recreational catch for the 12-months from September 2017 to August 2018. Estimates are presented for annual catch (total, kept and released, by number) and proportions released (% released) for zones in each bioregion (Figure 102): Kimberley (Table 11) and Pilbara (Table 12) zones in the North Coast; Ningaloo (Table 13) and Carnarvon/Shark Bay (Table 14) zones in the Gascoyne Coast; Mid West (Table 15), Metro (Table 16) and South West (Table 17) zones in the West Coast; and the Albany (Table 18) and Esperance (Table 19) zones in the South Coast.

### 8.1 Kimberley

A total of 115 species/taxa were reported in the Kimberley zone in 2017/18, which represented 2.6% of the statewide total catch (by numbers). Estimates for species where the sample size and relative standard error was acceptable are given in Table 11. The most common finfish species were Stripey Snapper (11% of the zone total catch), Grass Emperor (10%), Barramundi (7%), Saddletail Snapper (5%), Blackspotted Rockcod (4%), Golden Snapper (4%), Blue Threadfin (3%), Mangrove Jack (3%), Crimson Snapper (3%), Spanish Mackerel (2%), Golden Trevally (2%), Giant Sea Catfish (2%), Blackspot Tuskfish (2%), Coral Trout (2%), Goldspotted Rockcod (2%), Red Emperor (2%), King Threadfin (2%) and Blue Tuskfish (2%). The most common invertebrate species were Mud Crab (6%) and Blue Swimmer Crab (2%). These 20 species accounted for 75% of the total catch (by numbers) in the Kimberley zone in 2017/18.

### 8.2 Pilbara

A total of 116 species/taxa were reported in the Pilbara zone in 2017/18, which represented 3.3% of the statewide total catch (by numbers). Estimates for species where the sample size and relative standard error was acceptable are given in Table 12. The most common finfish species were Red Emperor (9% of the zone total catch), Grass Emperor (8%), Coral Trout (7%), Rankin Cod (6%), Stripey Snapper (5%), Spangled Emperor (5%), Spanish Mackerel (4%), 0 Saddletail Snapper (3%), Blackspot Tuskfish (2%), Golden Trevally (2%), Goldspotted Rockcod (2%) and Chinaman Rockcod (2%). The most common invertebrate species were Blue Swimmer Crab (10%) and Squid (3%). These 14 species accounted for 70% of the total catch (by numbers) in the Pilbara zone in 2017/18.

### 8.3 Ningaloo

A total of 120 species/taxa were reported in the Ningaloo zone in 2017/18, which represented 2.5% of the statewide total catch (by numbers). Estimates for species where the sample size and relative standard error was acceptable are given in Table 13. The most common finfish species were Chinaman Rockcod (16% of the zone total catch), Spangled Emperor (9%), Redthroat Emperor (7%), Grass Emperor (7%), Western Yellowfin Bream (4%), Goldband Snapper (4%), Spanish Mackerel (3%), Golden Trevally (3%), Red Emperor (3%), Coral Trout (3%), Stripey Snapper (2%), Giant Trevally (2%) and Goldspotted Rockcod (2%). The most common invertebrate species



were Squid (6%) and Blue Swimmer Crab (3%). These 15 species accounted for 72% of the total catch (by numbers) in the Ningaloo zone in 2017/18.

#### **8.4 Carnarvon/Shark Bay**

A total of 124 species/taxa were reported in the Carnarvon/Shark Bay zone in 2017/18, which represented 5.6% of the statewide total catch (by numbers). Estimates for species where the sample size and relative standard error was acceptable are given in Table 14. The most common finfish species were Pink Snapper (27% of the zone total catch), Grass Emperor (11%), Redthroat Emperor (5%), Spangled Emperor (4%), Chinaman Rockcod (3%), Red Emperor (2%), Rankin Cod (2%) and Baldchin Groper (2%). The most common invertebrate species were Blue Swimmer Crab (20%) and Squid (5%). These 10 species accounted for 79% of the total catch (by numbers) in the Carnarvon/Shark Bay zone in 2017/18.

#### **8.5 Mid West**

A total of 118 species/taxa were reported in the Mid West zone (including the Kalbarri zone) in 2017/18, which represented 9.6% of the statewide total catch (by numbers). Estimates for species where the sample size and relative standard error was acceptable are given in Table 15. The most common finfish species were Baldchin Groper (5% of the zone total catch), West Australian Dhufish (5%), Pink Snapper (4%), Australian Herring (4%), Silver Trevally (3%), Redthroat Emperor (3%) and School Whiting (2%). The most common invertebrate species was Western Rock Lobster (58%) and Blue Swimmer Crab (2%). These nine species accounted for 86% of the total catch (by numbers) in the Mid West zone in 2017/18.

#### **8.6 Metropolitan**

A total of 144 species/taxa were reported in the Metropolitan zone in 2017/18, which represented 54.5% of the statewide total catch (by numbers). Estimates for species where the sample size and relative standard error was acceptable are given in Table 16. The most common finfish species were School Whiting (12% of the zone total catch), Australian Herring (5%), Pink Snapper (2%), Silver Trevally (2%) and West Australian Dhufish (2%). The most common invertebrate species were Western Rock Lobster (31%), Blue Swimmer Crab (29%) and Squid (3%). These eight species accounted for 86% of the total catch (by numbers) in the Metropolitan zone in 2017/18.

#### **8.7 South West**

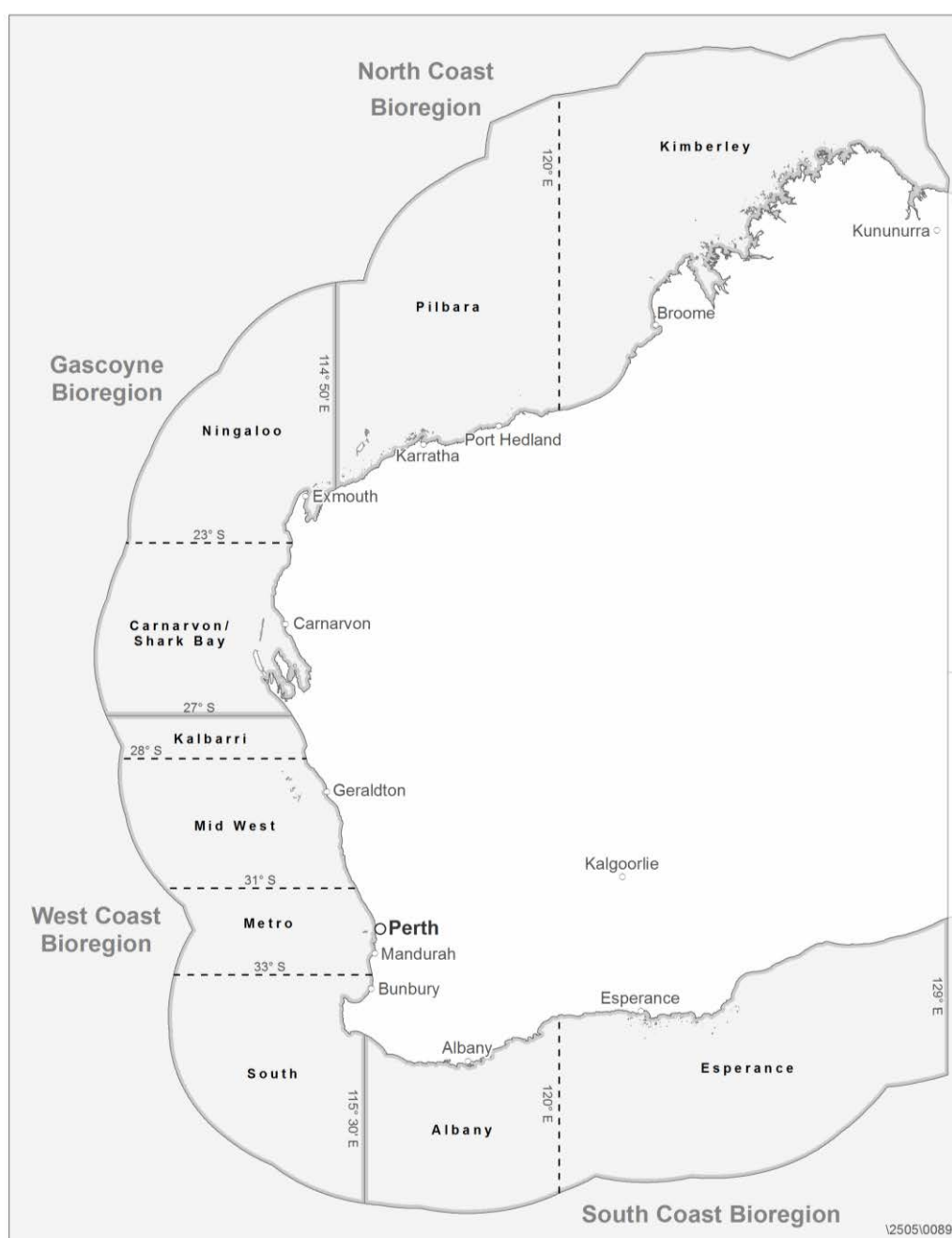
A total of 100 species/taxa were reported in the South West zone in 2017/18, which represented 15.4% of the statewide total catch (by numbers). Estimates for species where the sample size and relative standard error was acceptable are given in Table 17. The most common finfish species were School Whiting (11% of the zone total catch), West Australian Dhufish (6%), Australian Herring (5%), Pink Snapper (4%), King George Whiting (2%), Black Bream (2%), Silver Trevally (2%) and Western King Wrasse (2%). The most common invertebrate species were Blue Swimmer Crab (38%), Western Rock Lobster (14%) and Squid (3%). These 11 species accounted for 89% of the total catch (by numbers) in the South West zone in 2017/18.

## **8.8 Albany**

A total of 83 species/taxa were reported in the Albany zone in 2017/18, which represented 5.4% of the statewide total catch (by numbers). Estimates for species where the sample size and relative standard error was acceptable are given in Table 18. The most common finfish species were King George Whiting (19% of the zone total catch), School Whiting (10%), Black Bream (10%), Australian Herring (9%), Pink Snapper (7%), Bight Redfish (5%), Breaksea Cod (4%), West Australian Dhufish (3%), Silver Trevally (2%), Southern Bluespotted Flathead (2%), Swallowtail (2%), Sea Sweep (2%), Blue Morwong (2%) and Western King Wrasse (2%). The most common invertebrate species was Squid (4%). These 15 species accounted for 83% of the total catch (by numbers) in the Albany zone in 2017/18.

## **8.9 Esperance**

A total of 66 species/taxa were reported in the Esperance zone in 2017/18, which represented 1.0% of the statewide total catch (by numbers). Estimates for species where the sample size and relative standard error was acceptable are given in Table 19. The most common finfish species were Bight Redfish (27% of the zone total catch), Australian Herring (12%), Breaksea Cod (10%), Black Bream (9%), School Whiting (5%), Swallowtail (5%), Blue Morwong (4%), Brownspotted Wrasse (4%), Squid (3%), Western King Wrasse (2%), Sea Sweep (2%), Silver Trevally (2%) and Sergeant Baker (2%). The most common invertebrate species was Squid (3%). These 13 species accounted for 85% of the total catch (by numbers) in the Esperance zone in 2017/18.



**Figure 102.** Map of reporting areas in Western Australia, including four bioregions (solid lines) and ten zones within bioregions (dotted lines).

**Table 11.** Estimated annual catch (total, kept and released numbers) and proportion released in the Kimberley zone of the North **Coast** during 2017/18 by RBFL holders aged five years or older (se is standard error; values in bold indicate relative standard error >40% (i.e. se >40% of estimate); only species where >30 respondents recorded catches of the species are reported).

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Catfish	Giant Sea Catfish	<i>Arius thalassinus</i>	<b>15</b>	<b>9</b>	1,727	392	1,741	392	99%
Coral Trout	Coral Trout	<i>Plectropomus maculatus</i> & <i>P leopardus</i>	689	185	775	303	1,464	397	53%
Emperor	Grass Emperor	<i>Lethrinus laticaudis</i>	3,384	1,156	4,154	1,509	7,539	2,435	55%
Giant Perch	Barramundi	<i>Lates calcarifer</i>	1,460	482	3,794	896	5,253	1,178	72%
Mackerel	Spanish Mackerel	<i>Scomberomorus commerson</i>	671	185	<b>1,135</b>	<b>589</b>	<b>1,805</b>	<b>739</b>	63%
Threadfin	Blue Threadfin	<i>Eleutheronema tetradactylum</i>	1,201	306	938	307	2,139	481	44%
Threadfin	King Threadfin	<i>Polydactylus macrochir</i>	590	123	562	177	1,151	246	49%
Tropical Snapper	Stripey Snapper	<i>Lutjanus carponotatus</i>	2,825	707	5,179	1,295	8,004	1,905	65%

**Table 12.** Estimated annual catch (total, kept and released numbers) and proportion released in the Pilbara zone of the North Coast during 2017/18 by RBFL holders aged five years or older (se is standard error; values in bold indicate relative standard error >40% (i.e. se >40% of estimate); only species where >30 respondents recorded catches of the species are reported).

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Cod	Chinaman Rockcod	<i>Epinephelus rivulatus</i>	275	88	1,162	440	1,437	451	81%
Cod	Goldspotted Rockcod	<i>Epinephelus coioides</i>	286	100	1,439	412	1,725	432	83%
Cod	Rankin Cod	<i>Epinephelus multinotatus</i>	3,516	874	1,902	547	5,418	1,188	35%
Coral Trout	Coral Trout	<i>Plectropomus maculatus</i> & <i>P leopardus</i>	3,965	618	2,079	396	6,045	842	34%
Emperor	Grass Emperor	<i>Lethrinus laticaudis</i>	2,388	674	<b>5,250</b>	<b>2,164</b>	7,638	2,698	69%
Emperor	Spangled Emperor	<i>Lethrinus nebulosus</i>	1,336	291	3,641	829	4,977	989	73%
Mackerel	Spanish Mackerel	<i>Scomberomorus commerson</i>	1,821	331	1,940	573	3,761	800	52%
Trevally	Golden Trevally	<i>Gnathanodon speciosus</i>	260	85	1,669	569	1,929	612	87%
Tropical Snapper	Red Emperor	<i>Lutjanus sebae</i>	3,666	749	5,019	974	8,685	1,567	58%
Tropical Snapper	Stripey Snapper	<i>Lutjanus carponotatus</i>	717	188	4,302	1,360	5,019	1,452	86%
Tuskfish Wrasse	Blackspot Tuskfish	<i>Choerodon schoenleinii</i>	1,401	427	626	199	2,027	484	31%

**Table 13.** Estimated annual catch (total, kept and released numbers) and proportion released in the Ningaloo zone of the Gascoyne Coast during 2017/18 by RBFL holders aged five years or older (se is standard error; values in bold indicate relative standard error >40% (i.e. se >40% of estimate); only species where >30 respondents recorded catches of the species are reported).

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Cod	Chinaman Rockcod	<i>Epinephelus rivulatus</i>	6,204	1,924	4,970	1,260	11,175	2,744	44%
Cod	Rankin Cod	<i>Epinephelus multinotatus</i>	589	134	281	87	870	198	32%
Coral Trout	Coral Trout	<i>Plectropomus maculatus</i> & <i>P leopardus</i>	1,372	315	558	190	1,929	443	29%
Emperor	Grass Emperor	<i>Lethrinus laticaudis</i>	2,458	734	2,372	806	4,830	1,386	49%
Emperor	Redthroat Emperor	<i>Lethrinus miniatus</i>	<b>2,411</b>	<b>993</b>	2,472	935	4,883	1,749	51%
Emperor	Spangled Emperor	<i>Lethrinus nebulosus</i>	2,989	483	3,181	734	6,170	1,048	52%
King Snapper	Goldband Snapper	<i>Pristipomoides multidens</i>	<b>2,015</b>	<b>870</b>	<b>585</b>	<b>278</b>	<b>2,600</b>	<b>1,124</b>	22%
Mackerel	Spanish Mackerel	<i>Scomberomorus commerson</i>	1,504	351	996	268	2,500	543	40%
Tropical Snapper	Red Emperor	<i>Lutjanus sebae</i>	791	174	1,262	477	2,053	552	61%
Tropical Snapper	Stripey Snapper	<i>Lutjanus carponotatus</i>	886	291	677	188	1,562	376	43%

**Table 14.** Estimated annual catch (total, kept and released numbers) and proportion released in the Carnarvon/Shark Bay zone of the Gascoyne Coast during 2017/18 by RBFL holders aged five years or older (se is standard error; values in bold indicate relative standard error >40% (i.e. se >40% of estimate); only species where >30 respondents recorded catches of the species are reported).

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Cephalopod	Squid	Order Teuthoidea - undifferentiated	<b>6,790</b>	<b>3,329</b>	<b>288</b>	<b>199</b>	<b>7,078</b>	<b>3,345</b>	4%
Crab	Blue Swimmer Crab	<i>Portunus armatus</i>	<b>21,140</b>	<b>9,571</b>	<b>9,531</b>	<b>3,874</b>	<b>30,670</b>	<b>13,348</b>	31%
Bream	Pink Snapper	<i>Chrysophrys auratus</i>	7,750	1,358	34,707	11,956	42,457	12,972	82%
Cod	Chinaman Rockcod	<i>Epinephelus rivulatus</i>	<b>1,411</b>	<b>571</b>	2,985	1,164	4,396	1,499	68%
Cod	Goldspotted Rockcod	<i>Epinephelus coioides</i>	538	139	<b>858</b>	<b>356</b>	1,396	438	61%
Cod	Rankin Cod	<i>Epinephelus multinotatus</i>	2,183	495	<b>859</b>	<b>401</b>	3,042	665	28%
Coral Trout	Coral Trout	<i>Plectropomus maculatus</i> & <i>P leopardus</i>	431	108	<b>559</b>	<b>344</b>	990	361	56%
Emperor	Grass Emperor	<i>Lethrinus laticaudis</i>	5,496	1,630	11,493	3,556	16,990	4,739	68%
Emperor	Redthroat Emperor	<i>Lethrinus miniatus</i>	3,115	661	5,016	1,558	8,130	1,926	62%
Emperor	Spangled Emperor	<i>Lethrinus nebulosus</i>	3,129	877	3,175	1,022	6,304	1,797	50%
Tropical Snapper	Red Emperor	<i>Lutjanus sebae</i>	2,322	629	1,090	422	3,413	833	32%
Tropical Snapper	Stripey Snapper	<i>Lutjanus carponotatus</i>	645	149	859	242	1,504	301	57%
Tuskfish Wrasse	Baldchin Groper	<i>Choerodon rubescens</i>	1,278	309	<b>1,157</b>	<b>565</b>	2,435	833	48%

**Table 15.** Estimated annual catch (total, kept and released numbers) and proportion released in the Mid West zone of the West Coast during 2017/18 by RBFL holders aged five years or older (se is standard error; values in bold indicate relative standard error >40% (i.e. se >40% of estimate); only species where >30 respondents recorded catches of the species are reported).

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Lobster	Western Rock Lobster	<i>Panulirus cygnus</i>	90,558	17,809	66,786	14,315	157,345	30,790	42%
Bream	Pink Snapper	<i>Chrysophrys auratus</i>	4,876	712	7,219	1,364	12,096	1,836	60%
Cod	Breaksea Cod	<i>Epinephelides armatus</i>	1,149	197	1,048	222	2,198	353	48%
Coral Trout	Coral Trout	<i>Plectropomus maculatus</i> & <i>P leopardus</i>	1,640	433	<b>1,774</b>	<b>724</b>	3,413	1,130	52%
Emperor	Redthroat Emperor	<i>Lethrinus miniatus</i>	1,916	448	5,294	1,298	7,210	1,601	73%
Emperor	Spangled Emperor	<i>Lethrinus nebulosus</i>	605	152	1,699	600	2,304	665	74%
Pearl Perch	West Australian Dhufish	<i>Glaucosoma hebraicum</i>	7,202	1,012	6,796	1,599	13,997	2,387	49%
Trevally	Samsonfish	<i>Seriola hippos</i>	322	84	1,528	459	1,850	487	83%
Trevally	Silver Trevally	<i>Pseudocaranx georgianus</i> spp complex	<b>3,424</b>	<b>2,076</b>	<b>3,843</b>	<b>2,677</b>	<b>7,267</b>	<b>4,721</b>	53%
Tuskfish Wrasse	Baldchin Groper	<i>Choerodon rubescens</i>	9,762	1,278	4,966	791	14,728	1,821	34%
Tuskfish Wrasse	Western King Wrasse	<i>Coris auricularis</i>	<b>573</b>	<b>278</b>	1,476	389	2,049	496	72%



**Table 16.** Estimated annual catch (total, kept and released numbers) and proportion released in the Metropolitan zone of the West Coast during 2017/18 by RBFL holders aged five years or older (se is standard error; values in bold indicate relative standard error >40% (i.e. se >40% of estimate); only species where >30 respondents recorded catches of the species are reported).

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Cephalopod	Cuttlefish	<i>Sepia spp</i>	1,776	358	814	212	2,590	442	31%
Cephalopod	Squid	Order Teuthoidea - undifferentiated	48,497	6,345	1,578	484	50,074	6,632	3%
Lobster	Western Rock Lobster	<i>Panulirus cygnus</i>	314,852	31,874	160,771	27,986	475,623	54,172	34%
Crab	Blue Swimmer Crab	<i>Portunus armatus</i>	194,339	16,561	255,638	24,928	449,977	39,331	57%
Sharks	Gummy Sharks	<i>Mustelus antarcticus</i> & <i>M stevensi</i>	473	142	510	126	984	197	52%
Rays	Other Rays Skates	Rays - undifferentiated	<b>35</b>	<b>34</b>	1,588	323	1,623	325	98%
Bream	Pink Snapper	<i>Chrysophrys auratus</i>	7,760	901	23,837	2,512	31,598	3,065	75%
Cod	Breaksea Cod	<i>Epinephelides armatus</i>	5,867	737	4,849	683	10,716	1,213	45%
Cod	Harlequin Fish	<i>Othos dentex</i>	860	145	<b>146</b>	<b>63</b>	1,006	160	14%
Flathead	Southern Bluespotted Flathead	<i>Platycephalus speculator</i>	2,415	750	8,298	1,682	10,714	2,096	77%
Flathead	Yellowtail Flathead	<i>Platycephalus westraliae</i>	580	175	7,134	1,695	7,714	1,748	92%
Gurnard	Gurnard	Neosebastidae - undifferentiated	<b>87</b>	<b>69</b>	928	193	1,016	206	91%
Pearl Perch	West Australian Dhufish	<i>Glaucosoma hebraicum</i>	10,928	1,061	13,382	1,426	24,310	2,315	55%
Salmon Herring	Australian Herring	<i>Arripis georgianus</i>	58,322	8,824	13,567	2,220	71,890	9,924	19%
Sergeant Baker	Sergeant Baker	<i>Aulopus purpurissatus</i>	785	258	2,414	469	3,198	589	75%
Tailor	Tailor	<i>Pomatomus saltatrix</i>	4,361	1,323	6,809	2,692	11,170	3,466	61%
Threadfin Bream	Western Butterfish	<i>Pentapodus vitta</i>	2,435	857	12,146	2,957	14,581	3,226	83%
Trevally	Samsonfish	<i>Seriola hippos</i>	628	161	2,487	557	3,116	611	80%
Trevally	Silver Trevally	<i>Pseudocaranx georgianus spp complex</i>	14,908	1,850	11,485	2,607	26,394	3,953	44%
Tuskfish Wrasse	Baldchin Groper	<i>Choerodon rubescens</i>	5,079	665	2,676	508	7,755	1,056	35%
Tuskfish Wrasse	Brownspotted Wrasse	<i>Notolabrus parilus</i>	<b>2,551</b>	<b>1,041</b>	14,502	2,889	17,052	3,599	85%
Tuskfish Wrasse	Foxfish	<i>Bodianus frenchii</i>	785	199	796	238	1,581	343	50%
Tuskfish Wrasse	Western King Wrasse	<i>Coris auricularis</i>	3,651	884	19,346	2,968	22,997	3,253	84%
Whiting	King George Whiting	<i>Sillaginodes punctata</i>	10,757	2,452	<b>2,283</b>	<b>941</b>	13,040	2,976	18%
Whiting	School Whiting	<i>Sillago schomburgkii, bassensis &amp; vittata</i>	136,055	18,273	50,678	17,157	186,733	30,242	27%

**Table 17.** Estimated annual catch (total, kept and released numbers) and proportion released in the South West zone of the West Coast during 2017/18 by RBFL holders aged five years or older (se is standard error; values in bold indicate relative standard error >40% (i.e. se >40% of estimate); only species where >30 respondents recorded catches of the species are reported).

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Cephalopod	Cuttlefish	<i>Sepia spp</i>	809	218	271	87	1,080	238	25%
Cephalopod	Squid	Order Teuthoidea - undifferentiated	13,817	2,244	<b>702</b>	<b>375</b>	14,519	2,361	5%
Lobster	Western Rock Lobster	<i>Panulirus cygnus</i>	48,064	10,392	12,710	3,716	60,774	12,628	21%
Crab	Blue Swimmer Crab	<i>Portunus armatus</i>	53,563	12,247	113,165	25,255	166,727	36,621	68%
Bream	Pink Snapper	<i>Chrysophrys auratus</i>	4,981	800	12,772	2,521	17,753	3,190	72%
Cod	Breaksea Cod	<i>Epinephelides armatus</i>	2,112	406	713	169	2,825	518	25%
Flathead	Southern Bluespotted Flathead	<i>Platycephalus speculator</i>	391	103	2,415	640	2,806	659	86%
Gurnard	Gurnard	Neosebastidae - undifferentiated	<b>137</b>	<b>94</b>	1,054	291	1,191	306	89%
Pearl Perch	West Australian Dhufish	<i>Glaucosoma hebraicum</i>	7,498	1,041	17,263	3,662	24,761	4,460	70%
Salmon Herring	Australian Herring	<i>Arripis georgianus</i>	17,137	3,490	4,067	1,084	21,205	3,971	19%
Trevally	Silver Trevally	<i>Pseudocaranx georgianus spp complex</i>	4,546	1,148	2,817	730	7,363	1,673	38%
Tuskfish Wrasse	Western King Wrasse	<i>Coris auricularis</i>	<b>929</b>	<b>462</b>	6,370	1,479	7,299	1,867	87%
Whiting	King George Whiting	<i>Sillaginodes punctata</i>	8,324	1,831	2,117	669	10,441	2,226	20%
Whiting	School Whiting	<i>Sillago schomburgkii, bassensis &amp; vittata</i>	<b>40,166</b>	<b>16,163</b>	<b>8,060</b>	<b>4,087</b>	<b>48,226</b>	<b>20,040</b>	17%

**Table 18.** Estimated annual catch (total, kept and released numbers) and proportion released in the Albany zone of the South Coast during 2017/18 by RBFL holders aged five years or older (se is standard error; values in bold indicate relative standard error >40% (i.e. se >40% of estimate); only species where >30 respondents recorded catches of the species are reported).

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Cephalopod	Squid	Order Teuthoidea - undifferentiated	6,607	1,813	<b>71</b>	<b>29</b>	6,678	1,820	1%
Bream	Black Bream	<i>Acanthopagrus butcheri</i>	3,409	1,100	12,368	3,569	15,777	4,449	78%
Bream	Pink Snapper	<i>Chrysophrys auratus</i>	3,848	883	6,160	1,474	10,008	1,883	62%
Cod	Breaksea Cod	<i>Epinephelides armatus</i>	4,464	705	1,939	493	6,403	1,070	30%
Morwong	Blue Morwong	<i>Nemadactylus valenciennesi</i>	2,194	361	432	155	2,626	425	16%
Pearl Perch	West Australian Dhufish	<i>Glaucosoma hebraicum</i>	2,233	382	2,437	692	4,670	1,010	52%
Redfish	Bight Redfish	<i>Centroberyx gerrardi</i>	7,045	1,325	1,075	261	8,120	1,455	13%
Redfish	Swallowtail	<i>Centroberyx lineatus</i>	1,698	387	965	268	2,664	594	36%
Salmon Herring	Australian Herring	<i>Arripis georgianus</i>	10,048	1,928	3,434	986	13,481	2,678	25%
Sergeant Baker	Sergeant Baker	<i>Aulopus purpurissatus</i>	426	123	1,279	318	1,705	401	75%
Sweep	Sea Sweep	<i>Scorpius aequipinnis</i>	1,804	411	833	238	2,637	538	32%
Trevally	Silver Trevally	<i>Pseudocaranx georgianus spp complex</i>	1,864	481	1,839	475	3,703	863	50%
Whiting	King George Whiting	<i>Sillaginodes punctata</i>	22,835	6,071	5,797	1,342	28,632	6,930	20%

**Table 19.** Estimated annual catch (total, kept and released numbers) and proportion released in the Esperance zone of the South Coast during 2017/18 by RBFL holders aged five years or older (se is standard error; values in bold indicate relative standard error >40% (i.e. se >40% of estimate); only species where >30 respondents recorded catches of the species are reported).

Reporting Group	Common Name	Scientific Name	Kept	se	Released	se	Total	se	% Rel
Cod	Breaksea Cod	<i>Epinephelides armatus</i>	2,056	461	926	233	2,982	680	31%
Morwong	Blue Morwong	<i>Nemadactylus valenciennesi</i>	901	282	<b>137</b>	<b>74</b>	1,037	351	13%
Redfish	Bight Redfish	<i>Centroberyx gerrardi</i>	4,364	1,006	3,386	1,077	7,749	2,031	44%
Salmon Herring	Australian Herring	<i>Arripis georgianus</i>	2,197	538	1,238	443	3,435	907	36%

## 9 Harvest Weights

This section presents estimates of harvest (kept catch, by weight) for the 12-months from September 2017 to August 2018 for the species assemblages (or suites) within each bioregion and habitat aligned with fisheries management in Western Australia. Estimates are provided for the: top 10 nearshore and estuarine scalefish species (or species groupings) in each bioregion (Table 20); dominant 15 scalefish species for the West Coast Demersal Scalefish Resource (Table 22); top 10 demersal scalefish species in the North Coast, Gascoyne Coast and South Coast (Table 21); top 10 pelagic scalefish species in the North Coast (Table 23); and crab resources in each Bioregion (Table 24).

Estimates of boat-based recreational catch (by number) are converted to estimates of harvest (by weight) according to average weights for key species, obtained from Boat Ramp Surveys (Appendix 1) or Tour Operator Returns (Charter Logbooks). Estimated average weights are influenced by sample design, management, and biological/environmental factors, therefore, sources of information and assumptions associated with estimated average weights can introduce bias for some species, and estimated average weights may be refined and adjusted over time.

The estimates of harvest from boat-based recreational fishing summarised in this section do not include catches from charter-boat recreational fishing. Estimates of harvest for nearshore and estuarine species will be underestimated, particularly those species with high proportions of shore-based recreational fishing effort. An overview of the information required for stock status reporting of major recreational fisheries, based on estimates of harvest and 95% confidence intervals during 2017/18, is provided in Table 25.

### 9.1 Nearshore and Estuarine Resources

The top 10 nearshore and estuarine species (or species groupings) in 2017/18 represented: 87% of the total catch (kept by numbers) in the North Coast, 94% in the Gascoyne Coast, 95% in the West Coast and 95% in the South Coast (Table 25). Estimated recreational harvest ranges (as 95% confidence intervals, CI) for the top 10 nearshore and estuarine species in 2017/18 compared with estimates from previous statewide surveys indicated the estimated harvest range:

- in the North Coast were steady at 20 t (95% CI 15–26 t) in 2017/18 compared with 21 t (95% CI 15–28) in 2015/16, 14 t (95% CI 10–18) in 2013/14 and 19 t (95% CI 13–25) in 2011/12 (as determined by confidence intervals not overlapping)
- in the Gascoyne Coast were steady at 11 t (95% CI 7–15 t) in 2017/18 compared with 6 t (95% CI 4–9) in 2015/16, 14 t (95% CI 8–20) in 2013/14 and 11 t (95% CI 8–14) in 2011/12
- in the West Coast were steady at 56 t (95% CI 49–64 t) in 2017/18 compared with 65 t (95% CI 57–73) in 2015/16, but lower than 76 t (95% CI 67–85) in 2013/14 and 114 t (95% CI 101–126) in 2011/12
- in the South Coast were steady at 26 t (95% CI 17–35 t) in 2017/18 compared with 17 t (95% CI 13–21) in 2015/16, 25 t (95% CI 20–30) in 2013/14, but lower than 44 t (95% CI 37–52) in 2011/12

**Table 20.** Estimated annual catch (kept numbers), average weight and estimated harvest weight for the top 10 nearshore and estuarine scalefish species during 2017/18 by RBFL holders aged five years or older (values in bold indicate relative standard error >40%; values in italics indicate <30 diarists recorded catches of the species).

Bioregion	Species	Estimated catch (kept by number)	Average weight (kg)	Source	Estimated harvest (tonnes)	Standard Error
North	Barramundi	1,587	4.040	C	6.411	1.963
North	Golden Trevally	968	4.921	C	4.764	1.742
North	Blue Threadfin	1,404	2.690	C	3.777	0.858
North	King Threadfin	622	4.854	C	3.019	0.607
North	Black Jewfish	234	3.174	C	0.743	0.270
North	Giant Trevally	193	3.512	C	0.678	0.253
North	Chinaman Rockcod	395	0.704	C	0.278	0.070
North	Western Yellowfin Bream	<b>431</b>	0.528	C	0.228	0.122
North	Javelinfish	<b>231</b>	0.847	C	0.196	0.079
North	Mullet	1,112	0.153	C	0.170	0.057
TOTAL		7,177			20.264	2.857
Gascoyne	Chinaman Rockcod	7,615	0.704	C	5.361	1.415
Gascoyne	Golden Trevally	417	4.921	C	2.052	0.718
Gascoyne	Western Yellowfin Bream	<b>1,694</b>	0.528	C	0.894	0.785
Gascoyne	Giant Trevally	<b>244</b>	3.512	C	0.857	0.544
Gascoyne	Mulloway	210	3.893	C	0.818	0.265
Gascoyne	Silver Trevally	<b>484</b>	0.885	C	0.428	0.240
Gascoyne	School Whiting	1,932	0.124	C	0.240	0.087
Gascoyne	Garfish	<b>1,254</b>	0.174	C	0.218	0.164
Gascoyne	Mullet	<b>1,356</b>	0.153	C	0.207	0.121
Gascoyne	Western Butterfish	<b>291</b>	0.440	C	0.128	0.121
TOTAL		15,497			11.203	1.903
West	School Whiting	179,034	0.094	B	16.829	2.309
West	Silver Trevally	22,879	0.512	B	11.714	1.622
West	Australian Herring	82,746	0.132	B	10.922	1.320
West	King George Whiting	19,221	0.438	B	8.419	1.345
West	Tailor	5,084	0.407	B	2.069	0.552
West	Southern Bluespotted Flathead	2,899	0.543	B	1.574	0.413
West	Mullet	<b>10,156</b>	0.153	C	1.554	1.222
West	Western King Wrasse	5,154	0.276	B	1.423	0.288
West	Brownspotted Wrasse	3,493	0.381	B	1.331	0.421
West	Western Butterfish	3,596	0.151	B	0.543	0.178
TOTAL		334,262			56.378	3.711
South	King George Whiting	23,018	0.688	C	15.836	4.183
South	Black Bream	4,137	0.549	C	2.271	0.684
South	Australian Herring	12,245	0.184	C	2.253	0.369
South	Silver Trevally	2,193	0.885	C	1.941	0.435
South	School Whiting	<b>15,374</b>	0.124	C	1.906	0.988
South	Other Trevally	520	1.084	C	0.564	0.214
South	Southern Bluespotted Flathead	793	0.595	C	0.472	0.131
South	Blue Mackerel	<b>540</b>	0.612	C	0.330	0.166
South	Yellowtail Scad	<b>780</b>	0.330	C	0.257	0.168
South	Mullet	<b>1,027</b>	0.153	C	0.157	0.104
TOTAL		60,627			25.987	4.404

Average weights where: <sup>B</sup> is bioregion estimate from Appendix 1\*, <sup>C</sup> unpublished Tour Operator Returns

Estimated recreational harvest ranges of nearshore and estuarine species (or species groupings) in 2017/18 compared with previous statewide surveys were steady for:

- Barramundi, Golden Trevally, Blue Threadfin, King Threadfin, Black Jewfish, Giant Trevally, Chinaman Rockcod and Mullet in the North Coast
- Chinaman Rockcod, Golden Trevally, Western Yellowfin Bream, Giant Trevally, Mulloway, Silver Trevally, School Whiting, Garfish, Mullet and Western Butterfish in the Gascoyne Coast
- School Whiting, Silver Trevally, Australian Herring, King George Whiting, Mullet, Western King Wrasse, Brownspotted Wrasse and Western Butterfish in the West Coast
- Black Bream, Australian Herring, Silver Trevally, School Whiting, Southern Bluespotted Flathead and Yellowtail Scad in the South Coast

Changes in the the estimated recreational harvest of individual species in the top 10 nearshore and estuarine species (or groupings) occurred for:

- Tailor in the West Coast with 2 t (95% CI 1–3) in 2017/18 was lower than 5 t (95% CI 3–7) in 2015/16, 5 t (95% CI 3–7) in 2013/14 and 14 t (95% CI 6–22) in 2011/12
- King George Whiting in the South Coast with 16 t (95% CI 8–24) in 2017/18 was higher than 3 t (95% CI 1–4) in 2015/16, but steady compared with 9 t (95% CI 5–13) in 2013/14 and 12 t (95% CI 8–17) in 2011/12

## 9.2 Demersal Resources

The Integrated Fisheries Management Plan for the West Coast Demersal Scalefish utilised estimates of recreational catch by weight from surveys conducted in 2005/06 (Department of Fisheries 2010). The estimated harvest weights for the West Coast Demersal Scalefish Fishery (Table 22) includes: the most commonly caught commercial and recreational species, demersal species where boat-based catches predominate, and species groupings for comparisons with the commercial catches. The ‘Emperor’ grouping includes 5 species: Bluespotted Emperor (*Lethrinus punctulatus*), Grass Emperor (*L. laticaudis*), Longnose Emperor (*L. olivaceus*), Redspot Emperor (*L. lentjan*), Redthroat Emperor (*L. miniatus*), Robinson’s Seabream (*Gymnocranius grandoculis*), Spangled Emperor (*L. nebulosus*) and Yellowtail Emperor (*L. atkinsoni*). The ‘Bight Redfish’ grouping includes Bight Redfish (*Centroberyx gerrardi*), Swallowtail (*C. lineatus*) and Yelloweye Redfish (*C. australis*).

The top 10 demersal species (or species groupings, 15 in the West Coast) in 2017/18 represented: 79% of the total catch (kept by numbers) in the North Coast, 81% in the Gascoyne Coast, 90% in the West Coast and 99% in the South Coast (Table 25). Estimated recreational harvest ranges for the top demersal species in 2017/18 compared with estimates from previous statewide surveys indicated the estimated harvest range:

- in the North Coast were higher at 75 t (95% CI 63–88 t) in 2017/18 compared with 40 t (95% CI 34–46) in 2015/16, but steady with 55 t (95% CI 46–65) in 2013/14 and 78 t (95% CI 69–87) in 2011/12

- in the Gascoyne Coast were steady at 96 t (95% CI 82–110 t) in 2017/18 compared with 99 t (95% CI 85–114) in 2015/16, 98 t (95% CI 85–111) in 2013/14, but lower than 144 t (95% CI 125–160) in 2011/12
- in the West Coast were steady at 231 t (95% CI 210–253 t) in 2017/18 compared with 213 t (95% CI 194–231) in 2015/16, but higher than 154 t (95% CI 140–168) in 2013/14 and 160 t (95% CI 145–174) in 2011/12
- in the South Coast were higher at 68 t (95% CI 59–77 t) in 2017/18 compared with 45 t (95% CI 38–51) in 2015/16 and 33 t (95% CI 30–37) in 2013/14, but steady with 54 t (95% CI 46–63) in 2011/12

Estimated recreational harvest ranges of demersal species (or species groupings) in 2017/18 compared with previous statewide surveys were steady for:

- Grass Emperor, Blackspot Tuskfish, Blue Tuskfish, Spangled Emperor, Stripey Snapper and Mangrove Jack in the North Coast
- Pink Snapper, Spangled Emperor, Goldband Snapper, Rankin Cod, Red Emperor, Grass Emperor, Redthroat Emperor, Coral Trout, Baldchin Groper and Stripey Snapper in the Gascoyne Coast
- West Australian Dhufish, Pink Snapper, Baldchin Groper, Breaksea Cod, Emperor, Bass Groper, Blue Morwong, Hapuku, Bight Redfish, Sergeant Baker, Blue-Eye Trevalla, Foxfish, Eightbar Grouper and Sea Sweep in the West Coast
- Bight Redfish, Pink Snapper, Blue Morwong, Breaksea Cod, Sea Sweep, Harlequin Fish, Swallowtail and Sergeant Baker in the South Coast

Changes in the estimated recreational harvest of individual species in the top 10 demersal species (or groupings) occurred for:

- Coral Trout in the North Coast at 12 t (95% CI 9–16) in 2017/18 was higher 6 t (95% CI 4–7) in 2015/16, but steady with 7 t (95% CI 5–10) in 2013/14 and 11 t (95% CI 8–15) in 2011/12
- Rankin Cod in the North Coast at 15 t (95% CI 8–22) in 2017/18 was higher than 5 t (95% CI 3–7) in 2015/16, but steady with 6 t (95% CI 4–9) in 2013/14 and 8 t (95% CI 6–10) in 2011/12
- Red Emperor in the North Coast at 15 t (95% CI 9–21) in 2017/18 was higher than 6 t (95% CI 3–9) in 2015/16, but steady with 7 t (95% CI 4–10) in 2013/14 and 9 t (95% CI 7–12) in 2011/12
- West Australian Dhufish in the South Coast at 13 t (95% CI 9–17) in 2017/18 was higher than 6 t (95% CI 3–8) in 2015/16, 3 t (95% CI 1–4) in 2013/14 and 4 t (95% CI 1–8) in 2011/12



**Table 21.** Estimated annual catch (kept numbers), average weight and estimated harvest weight for the top 10 demersal scalefish species during 2017/18 by RBFL holders aged five years or older (excluding West Coast, refer to Table 22) (values in bold indicate relative standard error >40%; values in italics indicate <30 diarists recorded catches of the species).

Bioregion	Species	Estimated catch (kept by number)	Average weight (kg)	Source	Estimated harvest (tonnes)	Standard Error
North	Rankin Cod	3,663	4.124	C	15.106	3.625
North	Red Emperor	4,269	3.516	C	15.010	2.862
North	Coral Trout	4,654	2.636	C	12.268	1.748
North	Grass Emperor	5,772	1.287	C	7.429	1.737
North	Saddletail Snapper	<b>3,472</b>	2.031	C	7.052	3.325
North	Blackspot Tuskfish	2,157	2.903	C	6.262	1.541
North	Blue Tuskfish	1,289	3.255	C	4.196	1.243
North	Spangled Emperor	1,503	2.381	C	3.579	0.707
North	Stripy Snapper	3,542	0.862	C	3.053	0.638
North	Mangrove Jack	1,575	0.970	C	1.528	0.372
TOTAL		31,896			75.483	6.590
Gascoyne	Pink Snapper	8,216	2.507	C	20.598	3.537
Gascoyne	Spangled Emperor	6,119	2.381	C	14.569	2.393
Gascoyne	Goldband Snapper	3,070	3.953	C	12.136	3.783
Gascoyne	Rankin Cod	2,772	4.124	C	11.432	2.124
Gascoyne	Red Emperor	3,113	3.516	C	10.945	2.299
Gascoyne	Grass Emperor	7,954	1.287	C	10.237	2.351
Gascoyne	Redthroat Emperor	5,526	1.134	C	6.266	1.378
Gascoyne	Coral Trout	1,802	2.636	C	4.750	0.894
Gascoyne	Baldchin Groper	1,278	3.098	C	3.959	0.960
Gascoyne	Stripy Snapper	1,530	0.862	C	1.319	0.284
TOTAL		41,380			96.211	7.182
South	Bight Redfish	11,409	1.318	C	15.037	2.212
South	West Australian Dhufish	2,281	5.751	C	13.118	2.214
South	Pink Snapper	4,009	2.507	C	10.051	2.224
South	Blue Morwong	3,095	3.207	C	9.926	1.478
South	Breaksea Cod	6,521	1.274	C	8.308	1.079
South	Hapuku	395	9.876	C	3.901	1.560
South	Sea Sweep	1,959	1.262	C	2.472	0.524
South	Harlequin Fish	1,010	2.000	C	2.020	0.442
South	Swallowtail	2,364	0.749	C	1.771	0.324
South	Sergeant Baker	<b>1,046</b>	2.216	C	1.158	0.280
TOTAL		34,089			67.762	4.597

Average weights where: <sup>C</sup> unpublished Tour Operator Returns

Trends in the estimated recreational harvests for the indicator species in the West Coast are as follows:

- West Australian Dhufish was steady at 123 t (95% CI 105–141) in 2017/18 compared with 113 t (95% CI 97–129) in 2015/16, and higher than 82 t (95% CI 69–94) in 2013/14 and 75 t (95% CI 64–87) in 2011/12
- Baldchin Groper was steady at 32 t (95% CI 26–38) in 2017/18 compared with 35 t (95% CI 28–42) in 2015/16, higher than 21 t (95% CI 17–25) in 2013/14 and steady with 30 t (95% CI 24–36) in 2011/12
- Pink Snapper was steady at 48 t (95% CI 40–55) in 2017/18 compared with 36 t (95% CI 30–42) in 2015/16, and higher than 30 t (95% CI 25–36) in 2013/14 and 32 t (95% CI 27–38) in 2011/12

**Table 22.** Estimated annual catch (kept numbers), average weight and estimated harvest weight for the dominant 15 species in the West Coast Demersal Scalefish Fishery during 2017/18 by RBFL holders aged five years or older (values in bold indicate relative standard error >40%; values in italics indicate <30 diarists recorded catches of the species).

Bioregion	Species	Estimated catch (kept by number)	Average weight (kg)	Source	Estimated harvest (tonnes)	Standard Error
West	West Australian Dhufish	25,627	4.810	B	123.266	9.129
West	Pink Snapper	17,618	2.716	B	47.850	3.900
West	Baldchin Groper	15,288	2.074	B	31.707	3.134
West	Breaksea Cod	9,128	0.969	B	8.845	0.867
West	Emperor	3,125	1.455	C	4.547	0.727
West	Bass Groper	<b>119</b>	30.791	C	3.664	2.186
West	Blue Morwong	1,240	2.648	B	3.284	0.853
West	Hapuku	<b>192</b>	9.876	C	1.896	1.116
West	Bight Redfish	1,003	1.476	B	1.480	0.285
West	Sergeant Baker	1,250	1.108	C	1.385	0.345
West	Blue-Eye Trevalla	<b>76</b>	14.970	C	1.138	0.659
West	Foxfish	1,201	0.780	B	0.937	0.186
West	Eightbar Grouper	<b>182</b>	4.635	C	0.844	0.705
West	Sea Sweep	520	1.261	B	0.656	0.178
West	Ruby Snapper	N/A				
TOTAL		76,569			231.499	10.845

Average weights where: <sup>B</sup> is bioregion estimate from Appendix 1\*, <sup>C</sup> unpublished Tour Operator Returns, n/a is not available

### 9.3 Pelagic Resources

The statewide top 10 pelagic scalefish species (or species groupings) in 2017/18 represented 85% of the total resource catch (kept by numbers) (Table 25). The top 10 pelagic species (or species groupings) in 2017/18 were represented by Spanish Mackerel (31% of the total resource catch), Southern Bluefin Tuna (11%), Samsonfish (10%), Cobia (7%), Yellowtail Kingfish (7%), Other Mackerel & Tuna (5%), School Mackerel (4%), Yellowfin Tuna (4%), Mackerel Tuna (3%) and Grey Mackerel (3%).

The estimated recreational harvest range for the statewide top ten pelagic species (or groupings) was steady at 104 t (95% CI 87–121 t) in 2017/18 compared with 106 t (95% CI 93–118 t) in 2015/16, but lower than 143 t (95% CI 124–163) in 2013/14 and 174 t (95% CI 154–193) in 2011/12 (Table 25).

Estimated recreational harvest ranges of indicator pelagic species (or species groupings) are compared with estimates from previous statewide surveys (Table 23):

- Spanish Mackerel were steady at 48 t (95% CI 37–58) in 2017/18 compared with 44 t (95% CI 35–54) in 2015/16, but lower than 86 t (95% CI 69–103) in 2013/14 and 93 t (95% CI 78–108) in 2011/12
- Samsonfish were steady at 13 t (95% CI 10–17) in 2017/18 compared with 15 t (95% CI 11–19) in 2015/16, 22 t (95% CI 16–28) in 2013/14 and 18 t (95% CI 14–22) in 2011/12

**Table 23.** Estimated annual catch (kept numbers), average weight and estimated harvest weight for the top 10 statewide pelagic scalefish species during 2017/18 by RBFL holders aged five years or older (values in bold indicate relative standard error >40%; values in italics indicate <30 diarists recorded catches of the species).

Bioregion	Species	Estimated catch (kept by number)	Average weight (kg)	Source	Estimated harvest (tonnes)	Standard Error
Statewide	Spanish Mackerel	5,221	9.153	C	47.788	5.400
Statewide	Samsonfish	1,718	7.605	C	13.065	1.787
Statewide	Cobia	1,206	6.932	C	8.360	1.338
Statewide	Southern Bluefin Tuna	1,823	4.203	C	7.662	2.278
Statewide	Other Mackerel & Tuna	<b>793</b>	9.153	C	7.258	5.675
Statewide	Yellowtail Kingfish	1,102	6.478	C	7.139	1.658
Statewide	Yellowfin Tuna	606	10.008	C	6.065	1.291
Statewide	Grey Mackerel	530	5.518	C	2.925	0.982
Statewide	Mackerel Tuna	576	4.381	C	2.523	0.613
Statewide	School Mackerel	682	1.988	C	1.356	0.443
TOTAL		14,257			104.141	8.803

Average weights where: <sup>C</sup> unpublished Tour Operator Returns

## 9.4 Crab Resources

Estimated recreational harvest ranges of crab resources in each bioregion are compared with estimates from previous statewide surveys (Table 25):

- Mud Crab in the North Coast (3,154, kept by number; Table 24) represents 92% of the estimated statewide catch (Table 4), catches for the Gascoyne Coast (Table 7) and West Coast (Table 8) had low sample sizes (< 30) and high rse (>40%)
- Mud Crab in the North Coast was steady at 2.5 t (95% CI 2–3) in 2017/18 compared with 2.5 t (95% CI 2–3) in 2015/16, but lower than 6.5 t (95% CI 5–8) in 2013/14 and 7 t (95% CI 5–9) in 2011/12
- Blue Swimmer Crab in the North Coast was steady at 1.5 t (95% CI 1–2) in 2017/18 compared with 2 t (95% CI 1–3) in 2015/16, 4 t (95% CI 2–6) in 2013/14 and 3 t (95% CI 2–5) in 2011/12
- Blue Swimmer Crab in the Gascoyne Coast was steady at 5 t (95% CI 1–10) in 2017/18 compared with 1 t (95% CI 1–2) in 2015/16, 2 t (95% CI 1–4) in 2013/14 and 4 t (95% CI 1–8) in 2011/12
- Blue Swimmer Crab in the West Coast was steady at 54 t (95% CI 45–63) in 2017/18 compared with 43 t (95% CI 36–50) in 2015/16 compared with 59 t (95% CI 50–68) in 2013/14, but lower than 87 t (95% CI 76–98) in 2011/12
- Blue Swimmer Crab in the South Coast was steady at <1 t (95% CI 0–0.14) in 2017/18 compared with 1 t (95% CI 0.2–1.2) in 2015/16, but lower than 2 t (95% CI 1–3) in 2013/14 and 3 t (95% CI 1–4) in 2011/12

**Table 24.** Estimated annual catch (kept numbers), average weight and estimated harvest weight for the crab resources during 2017/18 by RBFL holders aged five years or older (values in bold indicate relative standard error >40%; values in italics indicate <30 diarists recorded catches of the species).

Bioregion	Species	Estimated catch (kept by number)	Average weight (kg)	Source	Estimated harvest (tonnes)	Standard Error
North	Giant Mud Crab	<i>1,230</i>	1.09	C	1.341	0.391
North	Orange Mud Crab	1,924	0.607	C	1.168	0.271
TOTAL		3154			2.509	0.476
North	Blue Swimmer Crab	<i>6,522</i>	0.240	S	1.565	0.476
Gascoyne	Blue Swimmer Crab	<b>22,340</b>	0.240	S	5.362	2.304
West	Blue Swimmer Crab	249,112	0.217	B	54.057	4.497
South	Blue Swimmer Crab	<b>326</b>		S	0.078	0.036

Average weights where: <sup>B</sup> is bioregion estimate from Appendix 1\*, <sup>S</sup> is statewide estimate from 2011/12 to 2015/16 (Ryan et al. 2017), <sup>C</sup> unpublished Tour Operator Returns

## **9.5 Summary**

Estimates of harvest from boat-based recreational fishing presented in this chapter will be used alongside information provided in Commercial Logbooks and Tour Operator Returns to assess the status of fisheries resources. Estimates of harvest (Table 25) are important when a considerable portion of the total catch is attributable to the recreational sector, and therefore, estimates for these species are included in stock assessments and required for resource allocation.

**Table 25.** Information required for stock status reporting of major recreational fisheries based on estimates of boat-based recreational catch by RBFL holders aged five years or older (excluding charter-boat recreational fishing).

Resource	Year	Number of species/ taxa	Proportion of total catch (kept by number)	Estimated harvest (kept by number)	Standard Error	Estimated harvest (tonnes)	Standard Error	Estimated harvest (tonnes, 95% CI)
<b>North Coast Bioregion</b>								
North Coast Nearshore and Estuarine	1112	10	80	13,100	1,725	18.749	3.187	13–25
	1314	10	77	12,143	1,546	13.856	1.965	10–18
	1516	10	83	9,631	1,354	21.404	3.221	15–28
	1718	10	87	7,177	838	20.264	2.857	15–26
North Coast Demersal Scalefish	1112	10	79	45,498	3,223	78.009	4.675	69–87
	1314	10	75	30,410	2,841	55.407	4.773	46–65
	1516	10	77	20,696	1,922	40.063	3.240	34–46
	1718	10	79	31,896	2,755	75.483	6.590	63–88
North Coast Mud Crab	1112	2	100	9,508	1,250	6.991	0.969	5–9
	1314	2	100	8,948	1,351	6.528	0.974	5–8
	1516	2	100	3,364	691	2.473	0.472	2–3
	1718	2	100	3,154	573	2.509	0.476	2–3
North Coast Blue Swimmer Crab	1112	1	100	14,802	3,974	3.390	0.910	2–5
	1314	1	100	15,938	3,983	4.048	1.012	2–6
	1516	1	100	7,044	1,900	1.691	0.456	1–3
	1718	1	100	6,522	1,984	1.565	0.476	1–2
<b>Gascoyne Coast Bioregion</b>								
Gascoyne Coast Nearshore and Estuarine	1112	10	82	14,183	2,887	10.786	1.652	8–14
	1314	10	88	16,352	2,979	13.898	3.106	8–20
	1516	10	92	12,354	2,596	6.231	1.199	4–9
	1718	10	94	15,497	2,909	11.203	1.903	7–15
Gascoyne Coast Demersal Scalefish	1112	10	83	71,301	4,069	143.764	8.171	128–160
	1314	10	77	51,657	3,988	97.967	6.685	85–111
	1516	10	82	43,988	3,119	99.260	7.448	85–114
	1718	10	81	41,380	3,121	96.211	7.182	82–110
Gascoyne Coast Blue Swimmer Crab	1112	1	100	19,050	7,847	4.362	1.797	1–8
	1314	1	100	8,764	3,132	2.226	0.796	1–4
	1516	1	100	5,379	1,604	1.291	0.385	1–2
	1718	1	100	22,340	9,601	5.362	2.304	1–10

Resource	Year	Number of species/ taxa	Proportion of total catch (kept by number)	Estimated harvest (kept by number)	Standard Error	Estimated harvest (tonnes)	Standard Error	Estimated harvest (tonnes, 95% CI)
<b>West Coast Bioregion</b>								
West Coast Nearshore and Estuarine	1112	10	93	612,888	34,279	113.574	6.469	101–126
	1314	10	95	452,234	33,996	75.798	4.577	67–85
	1516	10	94	333,640	29,176	65.120	4.130	57–73
	1718	10	95	334,262	28,158	56.378	3.711	49–64
West Coast Demersal Scalefish	1112	13	89	61,795	2,418	159.640	7.259	145–174
	1314	14	87	59,625	2,414	154.006	7.321	140–168
	1516	15	93	71,524	2,815	212.641	9.617	194–231
	1718	14	90	76,569	3,059	231.499	10.845	210–253
West Coast Blue Swimmer Crab	1112	1	100	380,816	24,846	87.207	5.690	76–98
	1314	1	100	254,373	19,745	58.760	4.561	50–68
	1516	1	100	181,709	14,925	42.883	3.522	36–50
	1718	1	100	249,112	20,723	54.057	4.497	45–63
<b>South Coast Bioregion</b>								
South Coast Nearshore and Estuarine	1112	10	95	152,040	14,929	44.094	3.830	37–52
	1314	10	95	119,008	13,946	25.205	2.586	20–30
	1516	10	95	65,729	7,730	16.915	2.065	13–21
	1718	10	95	60,627	10,348	25.987	4.404	17–35
South Coast Demersal Scalefish	1112	10	97	35,423	2,527	54.420	4.323	46–63
	1314	10	98	24,174	1,506	33.485	2.031	30–37
	1516	10	96	29,015	2,283	44.652	3.383	38–51
	1718	10	99	34,089	2,268	67.762	4.597	59–77
South Coast Blue Swimmer Crab	1112	1	100	12,164	3,145	2.786	0.720	1–4
	1314	1	100	8,640	2,015	2.195	0.512	1–3
	1516	1	100	2,918	1,157	0.700	0.277	0.2–1.2
	1718	1	100	326	148	0.078	0.032	0–0.14
<b>Statewide</b>								
Statewide Pelagic	1112	10	83	24,937	1,687	173.524	10.035	154–193
	1314	10	86	21,587	1,605	143.272	10.063	124–163
	1516	10	86	15,619	1,022	105.705	6.463	93–118
	1718	10	85	14,257	1,141	104.141	8.803	87–121

## 10 Summary and Future Research

### 10.1 Overview

Participation, effort and catch from boat-based recreational fishing have been estimated from statewide surveys in 2011/12, 2013/14, 2015/16 and 2017/18. Although recreational fishing in Western Australia is conducted from boats and the shore across a range of marine and freshwater habitats, boat-based recreational fishing was estimated to account for 43% of recreational fishing effort and 46% of the recreational harvest in 2000/01, with both boat- and shore-based recreational fishing occurring almost entirely in marine waters (Henry and Lyle 2003).

Approximately 136,000 recreational fishers purchased a Recreational Boat Fishing Licence (RBFL) in 2016/17 and 2017/18 with half of these fishers residing in the Perth metropolitan area. Trends in participation (by recall for the previous 12-months) by residence, age, gender, avidity and bioregion fished varied but overall were consistent across the Screening and Benchmark Surveys from 2011 to 2018. The spatial coverage of the resident population influences the distribution of boat-based recreational fishing effort. Consequently, boat-based recreational fishing effort in 2017/18 was highest in the West Coast (76%) with the remainder in the North Coast (8%), Gascoyne Coast (10%) and South Coast (6%).

At a statewide level, most boat-based recreational fishing effort occurred in coastal nearshore (57%), inshore demersal (27%) and estuary habitats (11%), and the remainder in pelagic (2%), offshore demersal (2%) and freshwater (1%). Shore-based recreational fishing was not included in this report; therefore, recreational fishing effort would be under-estimated for nearshore, estuary and freshwater habitats. However, patterns in boat-based recreational fishing effort in this report were consistent with previous statewide surveys, including the National Recreational Fishing Survey in 2000/01, where most boat-based recreational fishing effort occurred in coastal waters (from the shoreline to 5km; 66%), followed by estuarine (19%), then offshore (>5km from the coast; 11%) (Henry and Lyle 2003).

Recreational fishers use a variety of fishing methods. At a statewide level, most boat-based recreational fishing effort was line fishing (61%), followed by potting (33%), diving (4%) and nets (1%). In 2000/01, line fishing accounted for 77% of recreational fishing effort, followed by potting methods (16%) (Henry and Lyle 2003). Distinct seasonal patterns of boat-based recreational fishing effort occur in autumn and winter, which are the most active seasons in the North Coast and Gascoyne Coast, and summer and autumn, the most active seasons in the West Coast and South Coast.

Estimates of effort from boat-based recreational fishing in Western Australia were generally consistent across the four statewide surveys, as were trends in effort by habitat, method and month. The estimated effort in the North Coast, Gascoyne Coast and South Coast in 2017/18 was similar with 2015/16, furthermore the decrease in effort that was observed in these bioregions in 2015/16, compared with 2013/14 and 2011/12, continued in 2017/18. However, the estimated effort in the West Coast was higher in 2017/18 compared with 2015/16, 2013/14 and 2011/12.



Estimates of effort from boat-based recreational fishing by bioregion were broadly consistent across the four statewide surveys. Effort by habitat, method and month for each bioregion were also generally consistent across the four statewide surveys. Notable exceptions for lower effort in 2017/18 occurred: in the North Coast (for line fishing, in nearshore and estuary habitats, from April to August 2018); in the Gascoyne Coast (for line fishing, in inshore habitat, from April to August 2018); and in the South Coast (for line fishing, in nearshore habitats, from October to November 2017 and March to April 2018). Estimated boat-based recreational fishing effort in the West Coast was higher in 2017/18 for potting, in nearshore habitat, and from November and December 2017.

At a statewide level, estimates of catch from boat-based recreational fishing were generally consistent across the four statewide surveys. At a bioregion level, comparisons can be made for both the species contributing to the top 10 species in each resource and the estimated harvest for each resource.

The top 10 nearshore and estuarine species (or species groupings) in 2017/18 represented: 87% of the total catch (kept by numbers) in the North Coast, 94% in the Gascoyne Coast, 95% in the West Coast and 95% in the South Coast. The estimated recreational harvest ranges for the top 10 nearshore and estuarine species: in the North Coast were steady at 20 t (95% CI 15–26 t) in 2017/18 compared with 21 t (95% CI 15–28) in 2015/16, 14 t (95% CI 10–18) in 2013/14 and 19 t (95% CI 13–25) in 2011/12; in the Gascoyne Coast were steady at 11 t (95% CI 7–15 t) in 2017/18 compared with 6 t (95% CI 4–9) in 2015/16, 14 t (95% CI 8–20) in 2013/14 and 11 t (95% CI 8–14) in 2011/12; in the West Coast were steady at 56 t (95% CI 49–64 t) in 2017/18 compared with 65 t (95% CI 57–73) in 2015/16, but lower than 76 t (95% CI 67–85) in 2013/14 and 114 t (95% CI 101–126) in 2011/12; and in the South Coast were steady at 26 t (95% CI 17–35 t) in 2017/18 compared with 17 t (95% CI 13–21) in 2015/16, 25 t (95% CI 20–30) in 2013/14, but lower than 44 t (95% CI 37–52) in 2011/12.

The estimated recreational harvest range for the top 10 demersal species (or groupings) in the North Coast were higher at 75 t (95% CI 63–88 t) in 2017/18 compared with 40 t (95% CI 34–46 t) in 2015/16, but steady with 55 t (95% CI 46–65) in 2013/14 and 78 t (95% CI 69–87) in 2011/12. This decrease was consistent with steady estimates of effort by boat-based recreational fishers in the North Coast in 2017/18 compared with 2015/16. Estimated recreational harvests in 2017/18 were higher for: Coral Trout (9–16 95% CI) compared with 2015/16 (4–7), but steady with 2013/14 (5–10) and 2011/12 (8–15); Rankin Cod (8–22) compared with 2015/16 (3–7), but steady with 2013/14 (4–9) and 2011/12 (6–10); and Red Emperor (9–21) compared with 2015/16 (3–9), but steady with 2013/14 (4–10) and 2011/12 (7–12). Estimated recreational harvests were steady for Grass Emperor, Blackspot Tuskfish, Blue Tuskfish, Spangled Emperor, Stripec Snapper and Mangrove Jack.

The estimated recreational harvest range for the top 10 demersal species (or groupings) in the Gascoyne Coast were steady at 96 t (95% CI 82–110) in 2017/18 compared with 99 t (95% CI 85–114) in 2015/16, 98 t (95% CI 85–111) in 2013/14, but lower 144 t (95% CI 125–160) in 2011/12. Estimated recreational harvests were steady for Pink Snapper, Spangled Emperor, Goldband Snapper, Rankin Cod, Red Emperor, Grass Emperor, Redthroat Emperor, Coral Trout, Baldchin Groper and Stripec Snapper in the Gascoyne Coast.

The estimated recreational harvest range for the top 15 demersal species (or groupings) in the West Coast were steady at 231 t (95% CI 210–253) in 2017/18 compared with 213 t (95% CI 194–231) in 2015/16, but higher than 154 t (95% CI 140–168) in 2013/14 and 160 t (95% CI 145–174) in 2011/12. The estimated recreational harvest range of West Australian Dhufish was steady in 2017/18 (105–141) compared with 2015/16 (97–129), and higher than 2013/14 (69–94) and 2011/12 (64–87). The estimated recreational harvest range of Baldchin Groper was steady in 2017/18 (26–38) compared with 2015/16 (28–42), and higher than 2013/14 (17–25) and 2011/12 (24–36). The estimated recreational harvest range of Pink Snapper was steady in 2017/18 (40–55) compared with 2015/16 (30–42), and higher than 2013/14 (25–36) and 2011/12 (27–38). Estimated recreational harvests were also steady for Breaksea Cod, Emperor, Bass Groper, Blue Morwong, Hapuku, Bight Redfish, Sergeant Baker, Blue-Eye Trevalla, Foxfish, Eightbar Grouper and Sea Sweep in the West Coast.

The estimated recreational harvest range for the top 10 demersal species (or groupings) in the South Coast were higher at 68 t (95% CI 59–77) in 2017/18 compared with 45 t (95% CI 38–51) in 2015/16, 33 t (95% CI 30–37) in 2013/14 and 54 t (95% CI 46–63) in 2011/12. Estimated recreational harvests in 2017/18 were higher for West Australian Dhufish (9–17 95% CI) compared with 2015/16 (3–8), 2013/14 (1–4) and 2011/12 (1–8). Estimated recreational harvests were steady for Bight Redfish, Pink Snapper, Blue Morwong, Breaksea Cod, Sea Sweep, Harlequin Fish, Swallowtail and Sergeant Baker in the South Coast.

The estimated recreational harvest of Mud Crab in the North Coast represented 92% of the statewide total catch (kept by numbers) in 2017/18. The estimated recreational harvest range of Mud Crab in the North Coast was steady at 2.5 t (95% CI 2–3) in 2017/18 compared with 2.5 t (95% CI 2–3) in 2015/16, but lower than 6.5 t (95% CI 5–8) in 2013/14 and 7 t (95% CI 5–9) in 2011/12. The estimated recreational harvest of Blue Swimmer Crab in the West Coast represented 90 % of the statewide total catch (kept by numbers) in 2017/18. The estimated recreational harvest range for Blue Swimmer Crab in the West Coast was steady at 54 t (95% CI 45–63) in 2017/18 compared with 43 t (95% CI 36–50) in 2015/16 and 59 t (95% CI 50–68) in 2013/14, but lower than 87 t (95% CI 76–98) in 2011/12.

The statewide top 10 pelagic scalefish species (or species groupings) in 2017/18 represented 85% of the total resource catch (kept by numbers). The estimated recreational harvest range for the top 10 pelagic species was steady at 104 t (95% CI 87–121 t) in 2017/18 compared with 106 t (95% CI 93–118 t) in 2015/16, but lower than 143 t (95% CI 124–163) in 2013/14 and 174 t (95% CI 154–193) in 2011/12. The estimated recreational harvest range of Spanish Mackerel was steady in 2017/18 (37–58) compared with 2015/16 (35–54), and lower than 2013/14 (69–103) and 2011/12 (78–108). The estimated recreational harvest range of Samsonfish was steady in 2017/18 (10–17) compared with 2015/16 (11–19), 2013/14 (16–28) and 2011/12 (14–22).

Changes in the magnitude of estimates over time only provide an indication of the number kept and/or released from recreational fishing between surveys and does not provide an indication of the drivers of changes in the resource abundance. Effort and catches reported from recreational fishers varies in accordance with the nature of the fishery (from both biological and human dimensions), spatial and temporal scales of the resource and fishing activity, and

how these collectively respond to management actions. For example, access to the resource can vary over time through fish availability, legal size and bag limits, fisher mobility or fishing technology. Comparing estimates of catch from recreational fishing has similar constraints to those required for evaluating changes in commercial catch where differences can result from changes in both fish abundance and catchability. Catchability can vary with changes in fish behaviour and movement patterns, which vary by species, age and environmental factors, or changes in fishing practices, such as changes in targeted effort, time spent fishing and distance travelled to fishing location. Comparing estimates of catch from recreational fishing also requires consideration of release rates and the potential for change in fisher behaviour (e.g. species or targeting substitution).

Most importantly, evaluating time series of estimates of catch from recreational fishing requires consideration of the uncertainty associated with estimates. For the statewide surveys, the desired outcome was to achieve estimates for indicator species at statewide and bioregion levels with a precision suitable for stock assessments and developing management policies. It should not be expected that similar precision will be achieved for less common species, or any species at small spatial scales, although the survey design and sample size have allowed this to occur for some species. For example, the sample size and relative standard error achieved for indicator species in the Mid West, Metropolitan and South West zones have provided representative and precise estimates for spatial assessment of the West Coast Demersal Scalefish Resource.

While this report compares estimates from four statewide surveys of boat-based recreational fishing, additional catches from charter-boat recreational fishing (reported in Tour Operator Returns) are used to determine the total catch from the recreational sector. Specific performance indicators, reference levels and catch tolerances will be reported separately, and these will be used to provide trends in total catch to assist in developing, monitoring and refining management arrangements.

## **10.2 Fine-scale Estimates**

It was anticipated that highest precision would be achieved for key species at annual and statewide levels, however, estimates with lower precision may be available at finer scale temporal (monthly) and spatial (zone within bioregions) levels.

The precision achieved for any estimate is generally dependent on the sample size and the level of variability in the data. Consequently, low accuracy and precision can occur for species caught rarely or infrequently from recreational fishing, or when disaggregating data to smaller spatial and temporal scales. The ability to improve precision in these situations depends on the ability to increase the sample size. Therefore, there is a recognised trade-off between survey costs and precision, which often requires balancing the need for desired precision with the available funding before commencing surveys.

## **10.3 Validation of Estimates from On-Site Surveys**

Estimates of effort and catch from boat-based recreational fishing from the four statewide surveys are being compared with previous recreational fishing surveys to determine if there

have been changes in the catch composition and harvest, and whether current management arrangements are appropriate. The results of these analyses will be published separately.

Additional components of the statewide surveys, the Boat Ramp and Remote Camera Surveys (to be reported separately) have provided biological data to assist in converting catch (by number) to harvest (by weight) and comparison of estimates of boat-based recreational fishing effort from the Phone-Diary Survey (fishers only) against launch and retrieval counts from the Remote Cameras (fishers and non-fishers). Additional information on the proportion of boat launches with fishers and non-fishers will allow direct comparison of boat-based recreational fishing effort and potentially an ongoing measure of fishing activity between statewide surveys.

## **10.4 Improving Accuracy and Precision of Estimates**

Recreational fishers are numerous, diverse and diffuse. They use numerous access points and platforms for fishing, including boats launched from harbours, marinas, beaches and private docks. Their divergent nature ranges from avid to infrequent fishers and different survey methods will encounter avid and infrequent fishers in different relative proportions. This means there is no single survey method that can be used to accurately and precisely estimate effort and catch from all recreational fisheries. Consequently, all surveys of recreational fishing have customised designs, which reflect the specific objectives of the survey, the spatial and temporal scope to be covered, the nature of the recreational fishery, and the constraints on resources available to conduct the survey.

A Research Partnership between the Department and Edith Cowan University has provided opportunities for postgraduate research to explore integration of spatial and temporal data obtained from recreational fishing surveys. To date, appropriate statistical and modelling methods have been explored to integrate the uncertainty associated with estimates of catch at different spatial and temporal scales (Aidoo *et al.* 2015; 2016). This research will assist in determining whether data from the statewide surveys can provide information at the resolution required for management of recreational fisheries at small spatial and temporal scales.

The Recreational Boat Fishing Licence (RBFL) was implemented in 2010 and uptake of licences numbers increased to 249,020 in 2017/18, then declined to 223,299 in 2018/19. Understanding any consequences that may occur due to changes in annual patterns of RBFL usage is critical when considering survey design and analysis, including behavioural adjustments of fishers. It is likely that some survey components will need to be modified to address any bias, and in some cases, it may be necessary to apply emerging techniques in survey design to further improve the accuracy and precision of estimates. This could include adjustment of weighting factors to account for avidity bias and non-intending fishing, subsequently estimates (and their uncertainty) may be revised on this basis.

As patterns in recreational fishing can change, the survey design needs to be flexible enough to accommodate these changes. A critical element of the Research Partnership is utilising expertise across several related disciplines (experimental design, survey sampling, data mining, spatial and temporal statistics) to allow further development and implementation of changes to the surveys if warranted. The Research Partnership with Edith Cowan University will also have a focus on developing human capital in fields directly relevant to statewide surveys.

The Department will continue to work proactively to ascertain whether additional information could be collected to better understand the human dimensions of recreational fishing and improve the accuracy and precision associated with estimates of effort and catch from recreational fishing to continue to provide the best available information for sustainable management of fishery resources.

## 11 Acknowledgements

This report would not be possible without contributions from all the recreational fishers who voluntarily participated in the recreational fishing surveys. The authors would also like to thank staff from the Department of Primary Industries and Regional Development, Edith Cowan University and RecFishWest that provided support and assistance for this project: Brett Harrison and staff from Geospatial Services for preparing licence extracts and maps; Stuart Blight and Cameron Desfosses for facilitating the remote camera surveys; field staff for conducting the on-site interviews and reading the remote camera data; Veronique Vanderklift and Mark Goninon for assistance with average weights from Tour Operator Returns; Vangie Gerginis for entering the on-site interview data and administration assistance throughout the phone surveys; Joshua Brown, Brett Crisafulli, Paul Lewis, Stephen Newman and Corey Wakefield for providing species identification training for interviewers; and Vicki Graham, Amber Sky, Cassidy Hill, Sonia Prokojes and staff from the Survey Research Centre (Edith Cowan University) for data collection and entry of the phone surveys. Laurie West (Kewagama Research) and Jeremy Lyle provided advice in ensuring a consistent approach to statewide Phone Surveys of recreational fishing. We also thank Nick Caputi, David Fairclough, Jeffrey Norriss, Paul Lewis, Kim Smith and Lachlan Strain for reviewing the report and providing valuable comments.

## 12 References

- Aidoo EN, Mueller U, Goovaerts P, Hyndes GA (2015). Evaluation of geostatistical estimators and their applicability to characterise the spatial patterns of recreational fishing catch rates. *Fisheries Research* **168**, 20–32.
- Aidoo EN, Mueller U, Hyndes GA, Ryan KL (2016). The effects of measurement uncertainty on spatial characterisation of recreational fishing catch rates. *Fisheries Research* **181**, 1–13.
- Allen GR (2009). *Field Guide to the Marine Fishes of Tropical Australia and South-East Asia*, Fourth Edition. Western Australia Museum, Perth, Western Australia. 287 pp.
- Blight SJ, Smallwood CB (2015). Technical manual for camera surveys of boat- and shore-based recreational fishing in Western Australia. Fisheries Occasional Publication No. 121. Department of Fisheries, Western Australia. 30 pp.
- Brown J, Dowling C, Hesp A, Smith K, Molony B (2013). Status of nearshore finfish stocks in southwestern Western Australia. Part 3: Whiting (Sillaginidae). Fisheries Research Report No. 248. Department of Fisheries, Western Australia. 128 pp.
- Cochran WG (1977). *Sampling Techniques*. Third Edition. Wiley, New York. 428 pp.
- Department of Fisheries (2010). Integrated Fisheries Management Report: West Coast Demersal Scalefish Resource. Fisheries Management Paper No. 247. Department of Fisheries, Western Australia. 65 pp.
- Department of Fisheries (2011). Recreational Fishing in Western Australia - Fishing Location Guide, May 2013. Fisheries Occasional Publication No. 92. Department of Fisheries, Western Australia. 20 pp.
- Department of Fisheries (2012). A Resource-based Management Approach for Recreational Fishing in Western Australia 2012–2017: Statewide management proposals for finfish, crustaceans, molluscs and other invertebrates. Fisheries Management Paper No. 252. Department of Fisheries, Western Australia. 54 pp.
- Department of Primary Industries and Regional Development (2018). Annual Report 2018. Department of Primary Industries and Regional Development, Western Australia. 248 pp.
- Department of Primary Industries and Regional Development (2019). Annual Report 2019. Department of Primary Industries and Regional Development, Western Australia. 276 pp.
- Department of Fisheries (2017). Recreational Fishing in Western Australia - Fish Identification Guide, May 2017. Fisheries Occasional Publication No. 103, fifth edition. Department of Fisheries, Western Australia. 33 pp.
- Fairclough DV, Molony BW, Crisafulli BM, Keay IS, Hesp SA, Marriott RJ (2014). Status of demersal finfish stocks on the west coast of Australia. Fisheries Research Report No. 253. Department of Fisheries, Western Australia. 96 pp.
- Gaughan DJ, Santoro K (eds) (2019). Status Reports of the Fisheries and Aquatic Resources of Western Australia 2017/18: The State of the Fisheries. Department of Primary Industries and Regional Development, Western Australia. 240 pp.

- Giri K, Hall K (2015). South Australian Recreational Fishing Survey 2013/14. Fisheries Victoria Internal Report Series No. 62. Department of Economic Development, Jobs, Transport and Resources, Victoria. 65 pp.
- Hartill BW, Cryer M, Lyle JM, Rees EB, Ryan KL, Steffe AS, Taylor SM, West L, Wise BS (2012). Scale- and Context-Dependent Selection of Recreational Harvest Estimation Methods: The Australasian Experience. *North American Journal of Fisheries Management* 32(1), 109-123
- Henry GW, Lyle JM (2003). The National Recreational and Indigenous Fishing Survey. Final Report for FRDC Project No. 99/158. Australian Government Department of Agriculture, Fisheries and Forestry, Canberra. 188 pp.
- Hutchins B, Swainston R (1999). *Sea Fishes of Southern Australia: complete field guide for anglers and divers*, Second Edition. Gary Allen Pty Ltd. 180 pp.
- Jones DS, Morgan GJ (2002). *A Field Guide to Crustaceans of Australian Waters*. Reed, New Holland. 224 pp.
- Jones K. (2009). South Australian Recreational Fishing Survey. South Australian Fisheries Management Series Paper No 54. PIRSA Fisheries, Adelaide. 84 pp.
- Lhor S (2010). *Sampling: design and analysis*, Second Edition. Brooks/Cole, Cengage Learning. 596 pp.
- Lindner RK, McLeod PB (1991). An economic impact of recreational fishing in Western Australia. Fisheries Management Paper No. 38. Department of Fisheries, Western Australia. 48 pp.
- Lumley T (2004). Analysis of complex survey samples. *Journal of Statistical Software* 9, 1–19
- Lumley T (2010). *Complex Surveys: a guide to analysis using R*. John Wiley and Sons Inc., New Jersey. 276 pp.
- Lyle JM, Coleman APM, West L, Campbell D, Henry GW (2002). An innovative methodology for the collection of detailed and reliable data in large-scale Australian recreational fishing surveys. In: *Recreational Fisheries: Ecological, Economic and Social Evaluation*. Pitcher TJ, Hollingworth CE (Editors), pp. 207–226. (Fish and Aquatic Resources Series No. 8, Blackwell Science, Oxford, UK).
- Lyle JM, Stark KE, Tracey SR (2014). 2012-13 survey of recreational fishing in Tasmania. The Institute for Marine and Antarctic Studies, University of Tasmania, 124 pp.
- Lyle JM, Tracey SR (2016). Tasmanian recreational rock lobster and abalone fisheries: 2015-16 fishing season. Institute for Marine and Antarctic Studies, University of Tasmania. 37 pp.
- Lyle JM, Tracey SR, Stark KE, Wotherspoon S (2009). 2007-08 survey of recreational fishing in Tasmania, TAFI Technical Report, Tasmanian Aquaculture and Fisheries Institute, Hobart. 107 pp.
- Lyle JM, Wotherspoon S, Stark KE (2010). Developing an analytical module for large-scale recreational fishery data based on phone-diary survey methodology. Final report to Fisheries Research and Development Corporation Project No. 2007/064. Tasmanian Aquaculture and Fisheries Institute, Hobart. 105 pp.
- Marriott R, Jackson G, Lenanton R, Telfer C, Lai E, Stephenson P, Bruce C, Adams D, Norriss J (2012). Biology and stock status of inshore demersal scalefish indicator species in the



- Gascoyne Coast Bioregion. Fisheries Research Report No. 228, Department of Fisheries, Western Australia. 216pp.
- McLeod P, Lindner R (2018). Economic Dimension of Recreational Fishing in Western Australia. Research Report for the Recreational Fishing Initiatives Fund. 83 pp.
- Misson D, Phillips B, Rawding C, Siow E (2019). Statewide recreational fishing survey 2019-20 Screening Survey: Technical Report. Report prepared for Fisheries Queensland Department of Agriculture and Fisheries. The Social Research Centre, Melbourne. 37 pp.
- Pollock KH, Jones CM, Brown TL (1994). *Angler survey methods and their applications in fisheries management*. (American Fisheries Society Special Publication 25), American Fisheries Society, Bethesda. 371 pp.
- R Core Team (2016). *R: A Language and Environment for Statistical Computing*. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.
- Rees AJ, Yearsley GK, Gowlett-Holmes K, Pogonoski J (2012). Codes for Australian Aquatic Biota (on-line version). CSIRO Marine and Atmospheric Research, World Wide Web electronic publication, 1999 onwards.
- Rome B.M., Newman S.J. (2010). North Coast Fish Identification Guide. Fisheries Occasional Publication No. 80. Department of Fisheries, Western Australia. 79 pp.
- Ryan KL, Hall NG, Lai EK, Smallwood CB, Taylor SM, Wise BS (2015). Statewide survey of boat-based recreational fishing in Western Australia 2013/14. Fisheries Research Report No. 268, Department of Fisheries, Western Australia. 208pp.
- Ryan KL, Hall NG, Lai EK, Smallwood CB, Taylor SM, Wise BS (2017). Statewide survey of boat-based recreational fishing in Western Australia 2015/16. Fisheries Research Report No. 287, Department of Primary Industries and Regional Development, Western Australia. 205pp.
- Ryan KL, Morison AK, Conron S (2009). Evaluating methods of obtaining total catch estimates for individual Victorian bay and inlet recreational fisheries. Final report to Fisheries Research and Development Corporation Project No. 2003/047. Department of Primary Industries, Queenscliff. 124 pp.
- Ryan KL, Trinnie FI, Jones R, Hart AM, Wise BS (2016). Recreational fisheries data requirements for monitoring catch shares. *Fisheries Management and Ecology* **23**, 218–233.
- Ryan KL, Wise BS, Hall NG, Pollock KH, Sulin EH, Gaughan DJ (2013). An integrated system to survey boat-based recreational fishing in Western Australia 2011/12. Fisheries Research Report No. 249, Department of Fisheries, Western Australia. 168pp.
- Särndal CE, Swensson B, Wretman J (2003). *Model Assisted Survey Sampling*. Springer Series in Statistics, New York. 265 pp.
- Smallwood CB, Tate A, Ryan KL (2017). Weight-length summaries for Western Australian fish species derived from surveys of recreational fishers at boat ramps. Fisheries Research Report No. 278, Department of Fisheries, Western Australia. 151 pp.
- Smallwood CB, Sumner NR (2007). A 12-month survey of recreational estuarine fishing in the South Coast bioregion of Western Australia during 2002/03. Fisheries Research Report No. 159. Department of Fisheries, Western Australia, 56 pp.
- Smith K, Brown J (2014). Biological synopsis of Australian herring (*Arripis georgianus*). Fisheries Research Report No. 251. Department of Fisheries, Western Australia. 40 pp.

- Smith K, Lewis P, Brown J, Dowling C, Howard A, Lenanton R, Molony B (2013). Status of nearshore finfish stocks in south-western Western Australia Part 2: Tailor. Fisheries Research Report No. 247. Department of Fisheries, Western Australia. 112 pp.
- Steffe AS, Taylor SM, Blight SJ, Ryan KL, Desfosses C, Tate AC, Smallwood CB, Lai EK, Trinnie FI, Wise BS (2017). Framework for Integration of Data from Remotely Operated Cameras into Recreational Fishery Assessments in Western Australia. Fisheries Research Report No. 286, Department of Primary Industries and Regional Development, Western Australia. 36 pp.
- Sumner NR, Williamson PC (1999). A 12-month survey of coastal recreational boat fishing between Augusta and Kalbarri on the west coast of Western Australia during 1996-97. Fisheries Research Report No. 117. Department of Fisheries, Western Australia. 58 pp.
- Sumner NR, Williamson PC, Blight SJ, Gaughan DJ (2008). A 12-month survey of recreational boat-based fishing between Augusta and Kalbarri on the west coast of Western Australia during 2005-06. Fisheries Research Report No. 177. Department of Fisheries, Western Australia. 44 pp.
- Sumner NR, Williamson PC, Malseed BE (2002). A 12-month survey of recreational fishing in the Gascoyne bioregion of Western Australia during 1998-99. Fisheries Research Report No. 139. Department of Fisheries, Western Australia. 60 pp.
- Survey Development Working Group (2000). Development of the National Recreational and Indigenous Fishing Survey, FRDC Project No. 98/169. NSW Fisheries Final Report Series No. 23 (Volume 1). 36 pp.
- Taylor SM, Ryan KL (2019). Concurrent Western Australian telephone surveys highlight the advantages of sampling from a registry of recreational fishers. *ICES Journal of Marine Science* <https://doi.org/10.1093/icesjms/fsz115>
- Taylor S, Webley J, McInnes K (2012). 2010 Statewide Recreational Fishing Survey. Department of Agriculture, Fisheries and Forestry, Queensland. 82 pp.
- Webley JAC, McInnes K, Teixeira D, Lawson A, Quinn R (2015). Statewide Recreational Fishing Survey 2013–14. Department of Agriculture and Fisheries, Queensland Government. 127 pp.
- West LD, Lyle JM, Matthews SR, Stark KE, Steffe AS (2012). Survey of recreational fishing in the Northern Territory, 2009/10. Northern Territory Fisheries. Department of Resources, Northern Territory. 128 pp.
- West LD, Stark KE, Murphy JJ, Lyle JM, Ochwada-Doyle FA (2015). Survey of Recreational Fishing in New South Wales and the ACT, 2013/14. Fisheries Final Report Series No. 149. Department of Primary Industries, New South Wales. 150 pp.
- Williamson PC, Sumner NR, Malseed BE (2006). A 12-month survey of recreational fishing in the Pilbara region of Western Australia during 1999-2000. Fisheries Research Report No. 153. Department of Fisheries, Western Australia. 61 pp.
- Wise BS, Fletcher WJ (2013). Determination and development of cost effective techniques to monitor recreational catch and effort in Western Australian demersal finfish fisheries. Final Report for FRDC Project 2005/034 and WAMSI Subproject 4.4.3. Fisheries Research Report No. 245. Department of Fisheries, Western Australia.

## Appendix: Estimates of average weight of key species from Boat Ramp Surveys in the West Coast Bioregion in 17/18.

Av wt is the average weight (measured in grams); n is the number of weight measurements recorded; se is standard error

Reporting Group	Common Name	Species Name	n	Av Wt	se
Abalone	Greenlip Abalone	<i>Haliotis laevis</i>	28	511	17
	Roe's Abalone	<i>Haliotis roei</i>	6	68	4
Cephalopods	Cuttlefish	<i>Sepia</i> spp.	2	5498	900
	Octopuses	Octopodidae - undifferentiated	1	354	
Lobster	Western Rock Lobster	<i>Paralimnites cygnus</i>	1634	588	8
Crab	Blue Swimmer Crab	<i>Portunus armatus</i>	794	217	3
Sharks	Gummy Shark	<i>Mustelus antarcticus</i>	8	3083	609
	Bronze Whaler	<i>Carcharhinus brachyurus</i>	4	8040	1761
	Dusky Whaler	<i>Carcharhinus obscurus</i>	1	4364	
	Whiskery Shark	<i>Furgaleus macki</i>	1	6476	
	Blacktip Shark	<i>Carcharhinus, Loxodon &amp; Rhizoprionodon</i> spp.	1	6272	
	Whaler & Weasel Sharks	Carcharhinidae - undifferentiated	2	3392	915
	Wobbegong	Orectolobidae - undifferentiated	3	5783	2915
Rays	Southern Fiddler Ray	<i>Trygonorrhina dumerilii</i>	1	1367	
Boarfish	Longsnout Boarfish	<i>Pentaceropsis recurvirostris</i>	1	967	
Bream	Pink Snapper	<i>Chrysophrys auratus</i>	173	2716	126
	Tarwhine	<i>Rhabdosargus sarba</i>	24	359	40
Bullseye	Rough Bullseye	<i>Pempheris klunzingeri</i>	1	62	
Cod	Breaksea Cod	<i>Epinephelides armatus</i>	211	969	26
	Chinaman Rockcod	<i>Epinephelus rivulatus</i>	15	535	72
	Goldspotted Rockcod	<i>Epinephelus coioides</i>	4	3799	97
	Harlequin Fish	<i>Othos dentex</i>	26	1329	106
	Tomato Rockcod	<i>Cephalopholis sonnerati</i>	1	1976	
Coral Trout	Barcheek Coral Trout	<i>Plectropomus maculatus</i>	9	2246	324
	Common Coral Trout	<i>Plectropomus leopardus</i>	14	2015	150
Damselfish	Mcculloch's Scalyfin	<i>Parma mccullochi</i>	2	549	35
	Scalyfin	<i>Parma victoriae</i>	1	478	
	Damselfishes	Pomacentridae - undifferentiated	2	322	96
Dottyback	Lined Dottyback	<i>Labracinus lineatus</i>	1	146	
Drummer	Silver Drummer	<i>Kyphosus sydneyanus</i>	7	1857	608
	Western Buffalo Bream	<i>Kyphosus cornelii</i>	3	2514	329
	Western Rock Blackfish	<i>Girella tephraeops</i>	1	503	
Emperor	Redthroat Emperor	<i>Lethrinus miniatus</i>	32	1153	77
	Spangled Emperor	<i>Lethrinus nebulosus</i>	7	2204	157
Flathead	Longhead Flathead	<i>Leviprora inops</i>	1	1244	
	Longspine Flathead	<i>Platycephalus longispinis</i>	4	189	16
	Northern Sand Flathead	<i>Platycephalus endrachtensis</i>	1	196	
	Southern Bluespotted Flathead	<i>Platycephalus speculator</i>	35	543	57
	Yellowtail Flathead	<i>Platycephalus westraliae</i>	4	506	315
	Flatheads	Platycephalidae - undifferentiated	1	287	
Flounder	Smalltooth Flounder	<i>Pseudorhombus jenynsii</i>	6	329	69
	Flounders	Bothidae, Psettodidae & Pleuronectidae - undifferentiated	1	202	
Garfish	Southern Garfish	<i>Hyporhamphus melanochir</i>	29	93	6
	Three-By-Two Garfish	<i>Hemiramphus robustus</i>	2	194	34
	Garfishes	Hemiramphidae - undifferentiated	1	175	

Reporting Group	Common Name	Species Name	n	Av Wt	se
Goatfish	Blacksaddle Goatfish	<i>Parupeneus spilurus</i>	3	671	150
	Bluespotted Goatfish	<i>Upeneichthys vlamingii</i>	10	490	114
	Goatfishes	Mullidae - undifferentiated	1	444	
Grunter	Sea Trumpeter	<i>Pelsartia humeralis</i>	3	187	34
	Western Striped Grunter	<i>Pelates octolineatus</i>	14	148	11
Grunter Bream	Goldspotted Sweetlips	<i>Plectorhinchus flavomaculatus</i>	11	1229	83
	Painted Sweetlips	<i>Diagramma labiosum</i>	5	2176	447
Gurnard	Bighead Gurnard Perch	<i>Neosebastes pandus</i>	1	878	
	Searobins & Armour Gurnards	Triglidae & Peristediidae - undifferentiated	1	1136	
Jewfish	Mulloway	<i>Argyrosomus japonicus</i>	6	8252	947
Leatherjacket	Black Reef Leatherjacket	<i>Eubalichthys bucephalus</i>	1	253	
	Bluelined Leatherjacket	<i>Meuschenia galii</i>	5	333	20
	Bluetail Leatherjacket	<i>Eubalichthys cyanoura</i>	1	855	
	Horseshoe Leatherjacket	<i>Meuschenia hippocrepis</i>	2	844	6
	Sixspine Leatherjacket	<i>Meuschenia freycineti</i>	4	839	148
Mackerel	Bigeye Tuna	<i>Thunnus obesus</i>	2	6251	2664
	Blue Mackerel	<i>Scomber australasicus</i>	10	345	52
	Frigate Mackerel	<i>Auxis thazard</i>	1	755	
	Spanish Mackerel	<i>Scomberomorus commerson</i>	5	11739	1336
Mahi Mahi	Mahi Mahis	<i>Coryphaena</i> spp.	11	3053	488
Moonfish & Batfish	Western Pomfred	<i>Schuettea woodwardi</i>	1	105	
Morwong	Blue Morwong	<i>Nemadactylus valenciennesi</i>	11	2648	185
	Dusky Morwong	<i>Dactylophora nigricans</i>	3	6608	685
	Redlip Morwong	<i>Cheilodactylus rubrolabiatus</i>	3	1130	110
Mullet	Sea Mullet	<i>Mugil cephalus</i>	2	946	4
Pearl Perch	West Australian Dhufish	<i>Glaucosoma hebraicum</i>	451	4810	139
Pigfish	Western Pigfish	<i>Bodianus vulpinus</i>	2	753	187
Pike	Longfin Pike	<i>Dinolestes lewini</i>	1	0	
	Snook	<i>Sphyræna novaehollandiae</i>	12	649	120
	Yellowtail Barracuda	<i>Sphyræna obtusata</i>	13	1105	214
Redfish	Bight Redfish	<i>Centroberyx gerrardi</i>	21	1476	104
	Swallowtail	<i>Centroberyx lineatus</i>	2	334	51
Salmon & Herring	Australian Herring	<i>Arripis georgianus</i>	821	132	1
	Western Australian Salmon	<i>Arripis truttaceus</i>	73	4632	77
Sand Bass	Sand Bass	<i>Psammoperca waigiensis</i>	7	557	70
Sergeant Baker	Sergeant Baker	<i>Latropiscis purpurissatus</i>	10	616	85
Snappers (Tropical)	Red Emperor	<i>Lutjanus sebae</i>	1	3697	
Stonefish	Western Red Scorpionfish	<i>Scorpaena sumptuosa</i>	5	627	124
Striped Grunter	Striped Grunters	Terapontidae - undifferentiated	7	77	9
Sweep	Banded Sweep	<i>Scorpis georgiana</i>	5	606	73
	Footballer Sweep	<i>Neatypus obliquus</i>	1	258	
	Moonlighter	<i>Tilodon sexfasciatus</i>	4	1018	91
	Sea Sweep	<i>Scorpis aequipinnis</i>	32	1261	61
Tailor	Tailor	<i>Pomatomus saltatrix</i>	37	407	49
Threadfin Bream	Western Butterfish	<i>Pentapodus vitta</i>	146	151	5
Trevalla	Blue-Eye Trevalla	<i>Hyperoglyphe antarctica</i>	1	11221	
Trevally	Samsonfish	<i>Seriola hippos</i>	13	8092	1137
	Silver Trevally	<i>Pseudocaranx georgianus</i> spp. complex	330	512	20
	Skipjack Trevally	<i>Pseudocaranx wrighti</i>	2	412	95
	Yellowtail Kingfish	<i>Seriola lalandi</i>	16	3629	311
	Yellowtail Scad	<i>Trachurus novaezelandiae</i>	14	81	6
Tuna	Skipjack Tuna	<i>Katsuwonus pelamis</i>	3	5563	278
	Southern Bluefin Tuna	<i>Thunnus maccoyii</i>	22	3246	156

Reporting Group	Common Name	Species Name	n	Av Wt	se
	Yellowfin Tuna	<i>Thunnus albacares</i>	1	13597	
Tuskfish & Wrasse	Baldchin Groper	<i>Choerodon rubescens</i>	254	2074	57
	Brownspeckled Wrasse	<i>Notolabrus parilus</i>	131	381	14
	Foxfish	<i>Bodianus frenchii</i>	45	780	33
	Southern Maori Wrasse	<i>Ophthalmolepis lineolatus</i>	7	156	35
	Western Blue Groper	<i>Achoerodus gouldii</i>	2	5015	239
	Western King Wrasse	<i>Coris auricularis</i>	138	276	11
Whiting	King George Whiting	<i>Sillaginodes punctatus</i>	175	438	24
	Southern School Whiting	<i>Sillago bassensis</i>	1150	94	1
	Western School Whiting	<i>Sillago vittata</i>	123	83	5
	Western Trumpeter Whiting	<i>Sillago burrus</i>	7	192	60
	Yellowfin Whiting	<i>Sillago schomburgkii</i>	2	97	7
	Whittings	Sillaginidae - undifferentiated	7	97	22
Wirrah	Western Wirrah	<i>Acanthistius serratus</i>	2	750	24
Southern Blue Devil	Southern Blue Devil	<i>Paraplesiops meleagris</i>	2	396	40
Small Baitfish	Australian Sardine	<i>Sardinops sagax</i>	1	52	
	Common Hardyhead	<i>Atherinomorus vaigiensis</i>	18	7	0
	Silverbelly	<i>Parequula melbournensis</i>	1	44	