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Survey of recreational fishing in NSW, 2021/22 – Key Results

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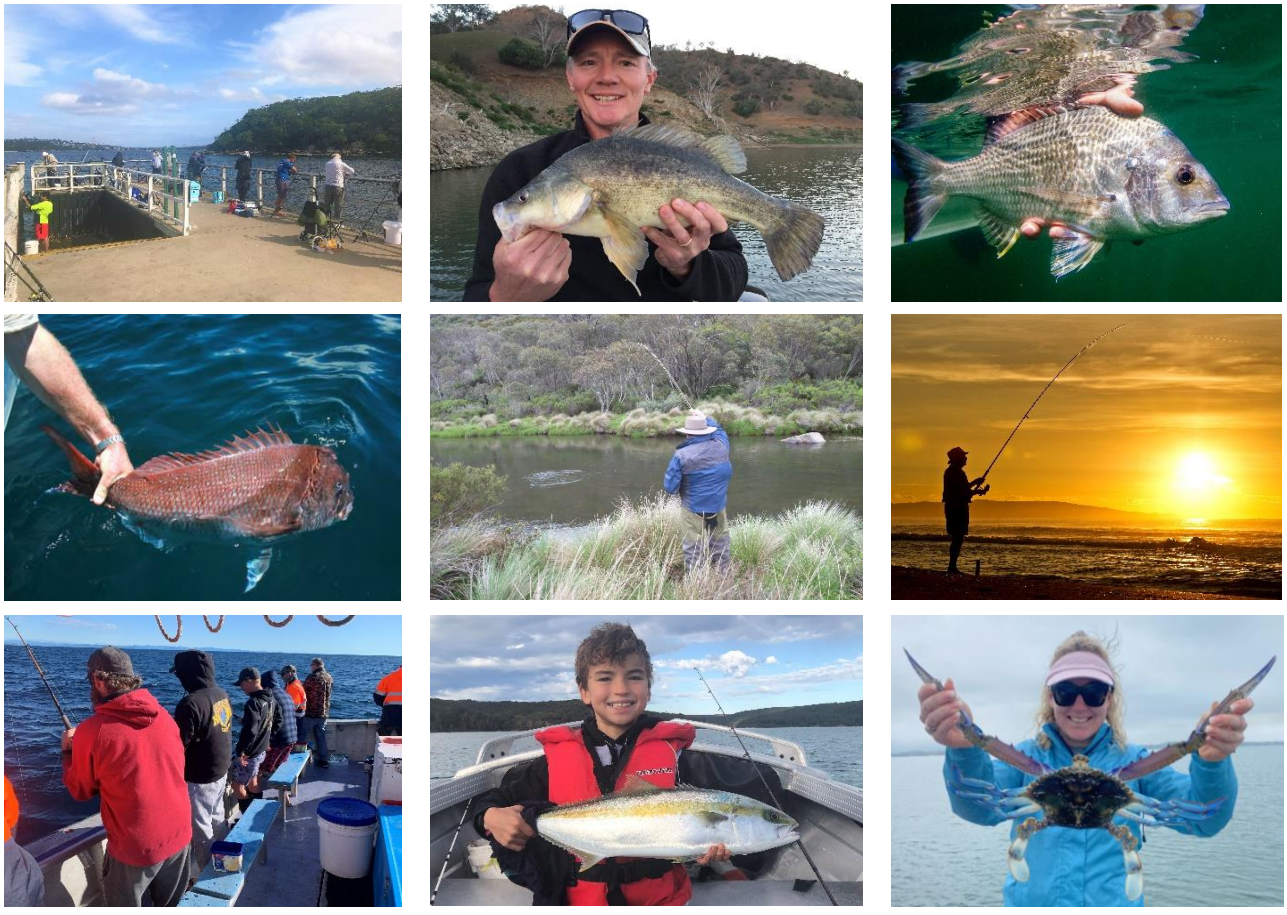

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Survey of recreational fishing in NSW, 2021/22 - Key Results

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Non-technical summary

Objectives

To provide detailed information on recreational fishing in NSW waters, including annual catch and effort information for long-term (1 or 3-year duration) NSW recreational fishing licence holders (RFL holders) and other members of their households (RFL household fishers) – by fishing method, platform (boat or shore), waterbody type (ocean waters, estuaries, rivers and lakes/dams) and for six defined fishing zones during the period November 2021 to October 2022.

Key words

Recreational fishing, telephone-diary survey

Fishing participation and effort

The 2021/22 survey estimated that 339,334 residents of RFL households aged five years and older fished at least once in NSW waters during the twelve months from November 2021 to October 2022 across a variety of freshwater and saltwater environments. This equated to a total estimated fishing effort of 1,699,665 fisher-days.

Overall, saltwater fishing represented 70% of the total fishing effort while fishing in freshwater accounted for the remaining 30%. The majority of saltwater fishing (71% of saltwater effort) occurred within estuaries with the remainder (29%) in ocean waters. For freshwater fishing, the majority of effort (64%) occurred in rivers, with the remainder occurring in lakes and dams (36%).

Shore-based fishing accounted for 64% of all effort and line fishing (with bait or lures) was the dominant fishing method at 96% of the total effort.

Regionally, three coastal saltwater fishing zones accounted for the vast majority (70%) of all state-wide effort, and the Central and North coastal regions (33% and 23% respectively) had the highest activity levels among these coastal regions. Within the three freshwater zones, the majority of state-wide freshwater effort (76%) occurred within the Murray-Darling region.

Catch

Survey participants recorded the capture of a diverse range of finfish, elasmobranchs (sharks and rays), crustaceans, molluscs, and other taxa, with 123 species and species groupings caught during 2021/22.

Overall, the total state-wide recreational catch of RFL households was estimated to be 7,736,592 individual organisms, with 3,658,098 being kept (47% of total catch) and the remaining 4,078,494 released (53% of total catch).

In terms of saltwater fish, Bream was the most common species/group caught (an estimated 1,112,741 individuals), followed by Dusky Flathead (515,197), Snapper (306,850) Sand Whiting (302,238) and Yellowtail Scad (217,202). Among freshwater fish, Redfin Perch (349,576) was the most common species caught, followed by Murray Cod (335,478), European Carp (292,598) and Rainbow Trout (176,437).

The smaller crustacean species dominated the remainder of the total catch, including saltwater nippers (708,532), followed by freshwater shrimp (342,106) and saltwater prawns (332,866). Freshwater yabbies (259,616) accounted for the majority of the larger crustaceans, followed by Mud Crab (48,538), Rock Lobster (36,989) and Blue Swimmer Crab (18,180).

Overall, 53% of all species/groups caught were released (or discarded), with the highest rates of release (>75%) observed for key saltwater finfish species/groups such as Mulloway, Australian Salmon, Bream, Yellowtail Kingfish and Sergeant Baker. For key freshwater finfish species/groups the highest rates of release (>75%) were for Trout Cod, Silver Perch, Murray Cod and Freshwater Catfish.

By contrast, the lowest release rates (<25%) occurred for saltwater finfish species/groups such as Blue Mackerel, Yellowtail Scad, Luderick and Mahi Mahi. Various crustaceans and molluscs also displayed very low release rates, such as Ghost Nippers and Pipis. For freshwater species/groups, European Carp and Redfin Perch had the lowest finfish release rates along with Freshwater Yabbies and Shrimps for crustacean species/groups.

In terms of reasons for release, 'small size' was the primary release reason for over two-thirds of all species groups and especially for sought after edible species, such as Bream, Dusky and Sand/Bluespotted Flathead, Sand Whiting, key freshwater finfish such as Murray Cod and Golden Perch, the various crustaceans and squid. Large catches ('too many' or 'over bag limit') were the primary release reasons for Freshwater Yabbies and various small bait species. 'Catch and release' was the primary release reason for Murray Cod and Australian Bass, with 'unwanted' the main reason for species/groups such as Red Rock Cod and elasmobranchs.

Comparison with previous surveys

Survey statistics

When comparing trends in the recreational fishery over time, it is important to note that sample sizes were similar among the four telephone-diary (TD) surveys completed so far (between ~1,900 and ~2,000 RFL households for each survey year). Net sample size for the current survey (1,967 RFL households) was similar to the previous three surveys with 1,882, 1,960 and 1,990 RFL households engaged in the 2013/14, 2017/18 and 2019/20 surveys, respectively.

Response rates to these four surveys remained high with ~80% to ~90% of households contacted responding to the survey. Numbers have dropped from a high in 2013/14 (89.6%) but have been stable for the following survey years - 82.6% in 2017/18, 80.8% in 2019/20 and 82.0% for 2021/22. Also, the proportions of eligible RFL households that completed the survey remained high among survey years with 92.0%, 95.8%, 92.9% and 87.7% of these RFL households completing the 12-month Diary Surveys for each of the four survey periods.

This consistency in response and completion rates among surveys allows for robust comparisons to be made. However, the issue of inter-annual variability among survey timepoints is a critical factor when interpreting any differences. These include environmental influences, natural changes in abundance, and socio-economic differences among survey years. Other factors that may also influence patterns include changes to fishing practices (e.g., increased usage of lures, increased preference for catch and release), targeting preferences, technology (e.g., GPS availability,

improvements to sounders), and regulations (e.g., size and bag/possession limits), among other things.

Fishing Participation

The 2021/22 survey showed a small increase in recreational fishing participation (number of persons in RFL households) compared with the previous survey year (2019/20) across both freshwater and saltwater fishing. Overall, participation in 2021/22 increased by ~6% compared with participation in 2019/20 but was still lower than 2017/18 and 2013/14 by ~14% and ~23% respectively. The magnitude of these trends was similar across participation by total persons, RFL holders, others within RFL households, and total households.

Fishing Effort and Catch

The 2021/22 survey showed a similar level of fishing effort to the previous survey year (2019/20), however overall fishing effort by RFL households during 2021/22 was somewhat lower than earlier surveys (>20% lower than 2017/18, and >32% lower than 2013/14).

The relative composition of key finfish and invertebrate species has been comparatively stable through the survey time-series, although there was some variation in catch at the species level. Similar to effort, the total catch (kept plus released) for all species in 2021/22 closely matched the 2019/20 survey, but was substantially lower than in 2017/18 (~17% lower) and 2013/14 (~33% lower).

The most common species reported in the survey—Yellowfin Bream and Dusky Flathead—showed similar catches in 2021/22 to 2019/20. Catch of Sand/Bluespotted Flathead has shown a continued decline across all previous years, and both Snapper and Sand Whiting catch was lower in 2021/22 than 2019/20. Of the common freshwater species, Murray Cod, Yabbies, and several trout species showed higher catches in 2021/22, likely associated with increased rainfall in inland catchments experienced during this survey year. Catch of Blue Swimmer Crab showed a pronounced decline in 2021/22, which was similar to observations of commercial catch across NSW.

Licence Sales

Licence sales and renewal figures have shown a steady decline over past 10 years. For 2021/22 sales for all licence categories combined were ~12% lower than for 2019/20, and ~20% and ~29% lower when compared to 2017/18 and 2013/14, respectively. This decline in sales was more evident amongst the short-term licence categories (1 month and 3 days duration) with a drop of ~26% when comparing 2021/22 to 2019/20, and much lower than 2017/18 (~41% lower than 2021/22) and 2013/14 (~53% lower than 2021/22). However, sales for long-term licences remained relatively steady over the same time periods.

Extrinsic Influences Affecting Recreational Fishing

When interpreting any changes in the NSW recreational fishery through time it is important to consider the potential causes of inter-annual variability. While these may reflect changes in fish abundance, they may also be influenced by environmental and socio-economic factors, as well as changes to fishing practices, targeting preferences, technology, and regulations.

The 2021/22 survey period encompassed a combination of extreme environmental and social factors that likely impacted on recreational fishing activity. During the 2021/22 survey period, coastal and

inland regions of NSW experienced some of the highest rainfall and flooding on record. The COVID-19 pandemic continued to disrupt society throughout the survey, with continuing restrictions on movement in the early stages of the survey affecting the ability of fishers to travel throughout the state. These environmental and social conditions were in marked contrast to conditions experienced during the previous survey of 2019/20 which was characterised by severe drought and bushfires. These major environmental and social impacts highlight the importance of the consistent, on-going time-series provided by the RFMP TD surveys.

Introduction

This study represents the fourth comprehensive assessment of recreational fishing in New South Wales (NSW) undertaken as part of the NSW-DPI Fisheries' Recreational Fisheries Monitoring Program (RFMP).

This report provides a snapshot of participation, fishing effort and catch, for the 2021/22 survey year and builds on three previous surveys completed in 2013/14 (West et al., 2015), 2017/18 (Murphy et al., 2020) and 2019/20 (Murphy et al., 2022). The continually developing time-series of data collected by the RFMP allows for an examination of trends through time that will assist in the management and assessment of recreational fisheries in NSW. These surveys give a 'big picture' perspective of recreational catch and effort throughout NSW and provide robust state-wide indices for the more common fishing activities and species caught.

Structure of this report

The first section of the report provides the background and need for the research, and summarises the survey design, methodology and the analysis approach. The results presented include survey statistics, estimates of participation (number of persons, specific to the survey frame), fishing effort (fisher-days) and catch (numbers kept and released). Results are presented for the whole fishery, as well as within sub-groups including by waterbody, platform, method and region. Catch results are also examined in detail for 20 key species of interest. The report is intentionally compiled as a data report, and thus commentary on the findings is intentionally brief. Appendices provide tabulations of key results presented graphically in the report body, and these data are available via the links in the Appendix section of the report. In addition to this report, a substantial database has been established in anticipation of requests for further detailed data summaries and analyses. The RFMP TD survey does not collect any information on fish sizes (length or weights), and estimates of harvest weights are not included in this report. Readers interested in converted harvest weights are encouraged to consult published Stock Assessment and Stock Status Summary reports, which are available at www.dpi.nsw.gov.au, and the Fisheries Research and Development Corporation's Status of Australian Fish Stocks Reports (www.fish.gov.au).

Background and Methodology

Why do we monitor recreational fishing within NSW?

The fisheries resources of NSW are shared among recreational fishers, commercial fishers, charter operators, and Aboriginal cultural fishers. Fisheries management seeks to ensure that use and exploitation of resources among sectors and stakeholders are ecologically sustainable, at the same time as servicing socio-economic objectives of recreational fishing (Sutinen & Johnston, 2003; Crowe et al., 2013; Fenichel et al., 2013; Ryan et al., 2016). The non-fishing public also value science- and data-based management, and recognise the importance of this for ensuring healthy aquatic ecosystems more broadly.

Recreational fishing is an important pastime for 19.6% of NSW and ACT residents and it is estimated that the recreational sector contributed about $4.07 billion to the NSW/ACT economy in 2019-20 (Moore et al., 2023).

Recreational fishing also supports substantial social outcomes for the community (Hyder et al., 2018), with primary motivations to go fishing including 'to relax and unwind', 'to spend time with family', 'to fish for sport' and 'to be outdoors' (Georgeson et al., 2015). The interaction with the natural environment that comes with recreational fishing not only provides demonstrated health benefits, but also fosters environmental stewardship among resource users and encourages the public to take an active interest in the health of our environmental assets (McPhee, 2017).

Effective fisheries management requires robust indices of effort and catch across space and time, for all sectors. Data collection in fisheries has historically focussed on the commercial sector, but contemporary fisheries are usually characterised by strong participation by recreational fishers, to the point where harvest for certain species by the recreational sector may exceed harvest by commercial fishers (Cooke & Cowx, 2006; Ihde et al., 2011; Lloret & Font, 2013; Ryan et al., 2016). Thus, data series that capture trends in recreational fishing through time are essential for characterising exploitation levels for many species. Furthermore, with diverse social outcomes, the collection of data on fishing quality and fisher experience in the context of motivational characteristics and objectives is important for tracking satisfaction through time, particularly where fisheries are managed within a harvest strategy framework.

NSW DPI-Fisheries and the NSW Recreational Fishing Trust have committed to ongoing collection of information on recreational fishing within NSW, through the RFMP. These surveys provide data that is essential for meeting management and reporting requirements for several State and Federal agencies. In addition, ongoing data on recreational fisheries are particularly important for NSW as fisheries management continues to be guided by cross-sectoral harvest strategies, supported by regular stock assessments, Total Allowable Fishing (TAF) allocation (for some species), and stock status reporting (see www.fish.gov.au).

The Recreational Fisheries Monitoring Program

The RFMP encompasses two components: 1) off-site fisher telephone-diary (TD) surveys; and 2) targeted on-site survey activity that has to date principally focussed on the 'for hire' charter fishery in NSW. Both components run on a biennial basis and, during each survey year, engage with thousands of recreational fishers who voluntarily provide information on their fishing activities within a specifically designed scientific framework. The primary objective of the RFMP off-site fisher

TD surveys is to collect data from which state wide indices of participation, effort, and catch can be derived.

The RFMP provides the only source of quantitative data on the activities of recreational fishers in NSW. This information is used in a number of different ways to assess the status of the resources that recreational fishers exploit. For example, data from the RFMP are used to ensure sustainable exploitation and management of these stocks and provide indicators of performance for this important industry. The information generated through the RFMP is the primary means by which the recreational sector can demonstrate its role as a significant user and custodian of wild fisheries resources. This in turn ensures that the interests of recreational fishers remain central in broader dialogue regarding resource management and that the needs of the recreational sector are therefore formally recognised and reflected in management arrangements and harvest strategies.

Benefits to recreational fishing are realised through a range of activities undertaken by the RFMP; some examples of these from recent years include:

- Provision of robust estimates of recreational catch, effort and size compositions to support stock assessments and stock status determination (e.g., Status of Australian Fish Stocks [SAFS]), and contribute to decision making (such as quota setting), for species that are commonly exploited by recreational fishers;
- Providing sources of evidence for threat and risk assessment under the Recreational Fishing Environmental Impact Assessment (EIA) process;
- Testing and evaluating the impact of proposed changes in management regulations, such as bag and size limits, which are increasingly being driven by recreational resource users;
- Providing data and analysis to support the deliberations and recommendations of the Recreational Fishing NSW Advisory Council (RFNSW);
- Providing data required to support mandated reporting requirements for recreational industries, such as the National Plan of Action for Minimising Incidental Catch of Seabirds in Australian Capture Fisheries (Department of Agriculture and Water Resources, 2018);
- Assessing the potential exposure risk associated with contamination for recreational fishers (e.g. impact of exposure to Per and Poly Fluoroalkyl Substances [PFAS]);
- Supporting the development of other fisheries management initiatives (e.g. stocking, artificial reefs) including evaluating stocking programs and prioritising allocation of fish to different waterbodies;
- Providing supporting data and analysis to ensure continued access to Southern Bluefin Tuna by anglers;
- Estimation of impacts of droughts, bushfires and global pandemics on recreational anglers;
- Informing matters of interest to key stakeholder groups (e.g., South Sydney Amateur Fishermen's Association, Recreational Fishing Alliance of NSW);
- Providing data for use in analysis and research publications prepared by researchers from within NSW DPI-Fisheries, as well as external organisations such as the Commonwealth Scientific and Industrial Research Organisation (CSIRO), the Australian National Centre for Ocean Resources and Security (ANCORS) and Universities;

- Evaluating spatial distribution patterns and angler interactions, with threatened, endangered and protected species (TEPS) and introduced species.

This report encompasses results from the off-site fisher TD survey component of the RFMP, with a focus on data collected during the 2021/22 survey (but also includes comparison with the results of previous surveys, where appropriate). A full background to recreational fishing surveys, fisher TD surveys, sampling frames, and a full description of the RFMP fisher TD survey methodology are provided in Murphy et al. (2020). However, important details are summarised below, so that readers of this report can interpret the results that are presented.

Who is included in the survey?

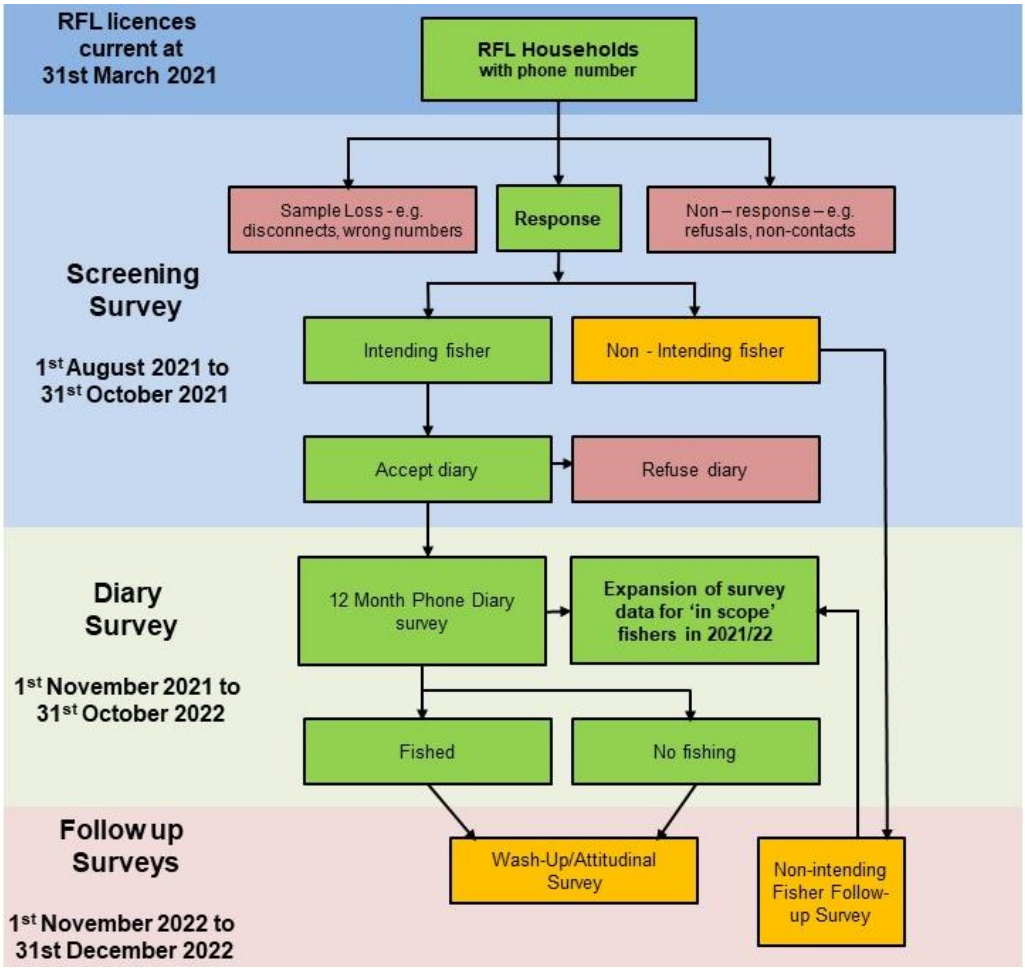
The biennial RFMP fisher TD survey selects participants from Recreational Fishing Licence (RFL) households, which are defined as households that include at least one resident who possesses a long-term (i.e., of 1 or 3 years duration) NSW recreational fishing licence (otherwise known as a NSW Recreational Fishing Fee Receipt [RFFR] — see NSW Recreational Fishing Fee). As the survey engages with the entire 'household', the data collected includes other household members (aged 5 years and older) who may be exempt from holding an RFFR, as well as any other long-term and short-term licence holders, and non-fishers, that reside within the household. A majority of fishing effort within NSW is attributable to RFL households resident within NSW and the ACT, Victoria and Queensland (Henry & Lyle, 2003; West et al., 2015; Murphy et al., 2020). Thus, RFL households across these jurisdictions are included in the survey. Small numbers of RFL households from other states (e.g., Tasmania) and international RFL holders are excluded from the survey frame.

Overview of survey approach

The TD survey methodology involves a multi-phase design, the principal components being an initial screening phase (referred to as the Screening Survey) to gather profiling information from a large sample of RFL households (as at 31st March 2021, for the 2021/22 survey) and a subsequent, intensive phase (referred to as the Diary Survey), in which respondents provide detailed catch and effort information over a 12-month period (for the 2021/22 survey, this ran from 1st November 2021 to 31st October 2022). Two additional phases follow on from the Diary Survey. Firstly, a sample of fishers from the Screening Survey who indicated that they did not intend to fish during the Diary Survey period, are contacted to verify whether they did actually fish during that period. This is called the Non-intending Fisher Follow-up Survey and identifies 'unexpected fishing' that may have occurred during the 12-month diary period, allowing for expanded estimates to be adjusted accordingly. Secondly, a Wash-up/Attitudinal Survey has been conducted in 2013/14, 2017/18, 2019/20 and 2021/22, which collects information such as opinions, levels of satisfaction, and issues of importance to recreational fishers. The Wash-up/Attitudinal Survey is subject to separate analysis and reporting and is not captured within this report.

Further details on the Screening Survey, Diary Survey, and Non-intending Fisher Follow-up Survey, are summarised in the figure below.

RFMP TD Survey design



Screening Survey

The Screening Survey is administered as a structured telephone interview on a stratified random sample of individual long-term RFL holders. Recreational Fishing Fee Receipts are assigned to an individual, which meant that the initial sampling frame was person-based. However, as noted above, the survey collects information for all household members (aged 5 years and older).

Survey respondents are asked for information on past fishing activity, any intention to fish in the coming 12 months, among other general profiling information (such as age and sex), for both themselves, and as well as for other members of the household. All eligible households (i.e., those intending to fish sometime over the next 12 months) are subsequently invited to participate in the Diary Survey.

The Screening Survey is stratified across 12 geographic areas defined by ABS Statistical Area classification, Level 4 (SA4) (see Murphy et al., 2020 for further details), and at least 15 calls are made to each active telephone number to maximise the proportion of the sample that is contacted. Disconnected numbers, wrong numbers and numbers with any other issues rendering them unusable, are treated as sample loss and not replaced. For the 2021/22 TD Survey, the Screening Survey occurred between 1st August and 31st October 2021.

Diary Survey

Long-term RFL households from the Screening Survey that accept the invitation to participate in the Diary Survey are issued with a diary kit (containing a diary card, a coloured fish identification booklet and a covering letter providing further details about the survey), and fishing activity of all household members aged 5 years and older is monitored over 12 months. The approach taken in this survey differs to conventional fisher TD surveys in that the diary card is employed more as a 'memory jogger' than a logbook, and responsibility for data collection rests with the survey interviewers rather than the diarists. Data collection is undertaken by several brief telephone interviews, in which trained interviewers record details of any fishing that had occurred since the last contact. The level of fishing activity determines the frequency of contact, but respondents are called at least once a month, even if no fishing was planned. All fishing activity is recorded by the interviewer, including fishing event duration, location, method, gear quantities, as well as any kept or released catch (detailed by species), and reasons for release.

Non-intending Fisher Follow-up Survey

A random sample is drawn from all long-term RFL households (identified during the Screening Survey) that indicated no intention to go fishing during the diary period (and hence ineligible for the Diary Survey) and these households are re-contacted shortly after the conclusion of the Diary Survey. Respondents are asked during a brief telephone interview whether any fishing had occurred during the diary period, and any changes in household members during that period are assessed. Further details are collected from any households in which (unexpected) fishing was reported, including which individual household members had fished and the number of days fished during the 12 months of the survey period.

What data are reported during the Diary Survey?

Fishing participation and effort

The number of fishers, fishing events, and hours fished per event are recorded by diarists and reported to interviewers. Fishing information is collected on an 'event' basis, where an event is defined as a discrete fishing episode and the actual household member(s) involved in the event are recorded, along with the number of other (non-household member) fishers that may have participated in the event. Separate fishing events within a day are defined by a change in fishing region or waterbody type, a change in target species and/or fishing method. As a result, a day's fishing trip could comprise several events, which are reported separately, such as gathering bait, and then using them for fishing later in the day; or deploying traps and leaving them set while line fishing. In this report, fishing effort is presented in terms of the estimated number of fishers who fished during the survey (or participation in fishing) and also is expressed as fisher-days (i.e., separate days on which some form of fishing was undertaken by each fisher).

Catch

The diary kit includes a coloured species identification guide to support accurate species identification. While best efforts are made by diarists to accurately identify species caught, species-based catch reporting is subject to some limitations, particularly for different species which are morphologically similar. In these cases, species complexes are used for reporting (e.g., 'Bream' and

'Leatherjackets'). Where diarists could not identify a species with any confidence, or for obscure or rare species for which there were few records, these were pooled into broader taxonomic categories for analysis (e.g., 'scalefish, other/unidentified', and 'sharks and rays').

Catches are reported as numbers of individuals kept or harvested, and numbers released or discarded, by species, for each fishing event.

The harvested (or kept) portion of a catch may be used for a variety of purposes including consumption or bait, whereas fish may be released because of regulation (e.g. size and/or bag limits), ethical reasons and undesirability of the species (among other reasons). To better understand fisher motivations in relation to releasing or discarding, respondents identify their reason(s) for release. The following release categories were identified and reported by diarists: 'too small' – implying that the fish was too small to be retained (not necessarily due to size limit regulations); 'undersized' – implying some knowledge and adherence to legal size limit regulations; 'over bag limit' – implying some knowledge and adherence to legal bag limit regulations; 'catch and release' – implying a voluntary release ethic associated with either sport fishing or conservation (no inference about fish size); and 'too many' – implying a catch number in excess of personal needs, as opposed to legal bag limits. Other reasons for release included 'poor eating qualities', 'unwanted', 'damaged or poor quality', 'berried female' and 'prohibited species'.

How are the survey data analysed?

Analysis and expansion of survey data

Detailed descriptions of the TD design philosophy and methodology employed by the RFMP and expansion approaches employed with this type of survey data are provided in Lyle et al. (2002), Henry and Lyle (2003), and Lyle et al. (2010). All analysis and expansion of survey data are undertaken using the statistical computing package R (R Core Team, 2017) principally through functions contained within the 'survey' package (Lumley, 2004; Lumley, 2010) which follows the algorithms outlined in Lyle et al. (2010). The analytical approach employed emulates that which has been applied to other state-wide recreational fishing surveys within Australia (Lyle et al., 2002; Lyle et al., 2014; Lyle et al., 2019; Ryan et al., 2015; Ryan et al., 2017; Ryan et al., 2019; West et al., 2015).

Measures of precision and accuracy

Measures of precision and accuracy are important to consider alongside the estimates of effort (numbers of days fished) or catch (numbers of fish) themselves. Standard error (SE) is provided for all estimates derived from RFMP fisher TD surveys, which provides a measure of statistical accuracy (the smaller the SE, the more accurate the estimate). When the SE is large, it becomes less likely that a given estimate may be an accurate representation of the true value. The size of the SE depends on factors such as the size of the sample, the design of the survey, and variability within the population being sampled. Increasing the size of the sample generally decreases the sampling error (NOAA, 2020) such that catch estimates for commonly caught species often have a smaller SE than catch estimates for rarely caught species. Standard error is displayed on charts in this report as bars above and below the estimated value (with each bar representing 1 SE).

Relative standard error (RSE) is also presented for some survey estimates. The RSE is simply the SE for an estimate expressed as a percentage of the estimate. As for SEs, large RSEs indicate low accuracy, while small RSEs indicate more accurate estimates. RSE allows for the comparison of the

relative precision and accuracy between different estimates. As a general rule, estimates with RSEs of greater than 30% may be regarded as less robust (in all tables within this report these estimates are presented in **bold face**). In addition, estimates derived from records with a sample size of fewer than 20 RFL households should be considered with caution, since they may be particularly influenced by the activities of very few fishers (these estimates are presented in *italics*). These characteristics of estimate quality follow similar conventions used for recreational fishing surveys in other jurisdictions (e.g., Lyle et al., 2019; Ryan et al., 2019; NOAA, 2020).

When comparing results from the four RFL household TD surveys undertaken to date in NSW (2013/14, 2017/18, 2019/20 and 2021/22) in order to identify any changes or developments that occurred in the recreational fishery over the intervening periods, the SEs provided with the point estimates must be taken into consideration. The degree of overlap between error bars on the survey point estimates provides an indication of statistical significance. Overlapping error bars suggest that the differences between the point estimates for the surveys are unlikely to be significant. Where there is no overlap of error bars between groups, the difference may be significant (and statistical testing should be applied to obtain a valid conclusion). It is important to note, however, that despite the robust nature and fundamental comparability of the studies, the comparison of just four points in time and the issue of inter-annual variability is a critical factor – especially in terms of variation in the natural availability of certain species and therefore the catch levels in a given year, as well as other chance events that may impact fishing among years (e.g., floods, droughts, bushfires, pandemics) – the potential impacts of such events that overlapped with the 2021/22 TD Survey are briefly discussed at the end of this report.

Reporting categories and definitions

Data from previous surveys

Some catch, effort and participation data within this report are presented alongside survey statistics from the three previous TD surveys of RFL households conducted in 2013/14, 2017/18 and 2019/20. These include aggregated estimates (i.e., aggregated on a state-wide basis) for survey statistics (sample sizes, response rates), fishing effort (participation and fisher-days), catch estimates (by number - for all species combined), as well as taxa-specific data for 20 key species/groups of interest. When considering these data, it is important to note that Queensland (QLD) residents were not included in the 2013/14 RFL household survey (mainly due to sampling and cost constraints at the time), but the subsequent surveys did include QLD resident fishers. Therefore, results presented in this report for 2013/14 may be an underestimate of RFL household fishing effort and catch for that year. Whenever results data for the 2013/14 year are presented in this report they are noted by an asterisk (*) highlighting the absence of QLD fisher data.

Sales of new RFFRs and renewals of existing ones for the 13-year period 2009/10 to 2021/22 are also presented as a supplementary indicator of trends in the NSW recreational fishery through time. Sales and renewal data may provide a measure of the eligible licenced population who intend to go fishing during a particular year. Sales of both short-term (3 days or 1 month duration) and long-term (1 or 3-year duration) licence categories are summarised.

Readers should note that an assumption regarding RFFR renewal patterns was altered for data analysis of the 2021/22 TD Survey (and future surveys), which led to a minor increase in the size of the population used in the expansion (see footnote [^] to table *Summary of RFMP Telephone-Diary*

Survey statistics through time for more details). This may have a minor impact (5-6% increase) on the 2021/22 catch numbers outlined in this report, as the expansion population is slightly larger than in past TD surveys.

More granular reporting categories are used (see below) to summarise estimates of effort and catch for the 2021/22 TD Survey. For information on results at these levels of reporting for the preceding surveys, see West et al. (2015) and Murphy et al. (2020).

Waterbody

The TD Survey is confined to fishing within NSW waters, which are defined as all waters within the borders of NSW and the Australian Capital Territory (ACT) and includes both State marine waters (out to 3 nm from the coast) and water further offshore to the 200 nm Exclusive Economic Zone (EEZ). Diarists report spatial information for fishing events, which includes both specific details on the location, and also whether fishing occurred within the waterbody categories:

1) Ocean waters (from the coastline to the edge of the EEZ); 2) Estuarine waters (including bays and inlets); 3) Freshwater rivers; and, 4) Freshwater lakes/dams (public or private).

Platform

Effort and catch details by fishing platform (Boat or Shore) are presented on a state-wide basis and are also displayed by the waterbody reporting category for this report (e.g., Boat or Shore fishing within estuaries, ocean waters, rivers and lake/dams).

Method

A variety of fishing/harvesting methods were identified by diarists but for the purposes of analysis, the following reporting categories have been defined: line fishing using bait; line fishing using lures (and/or jig/fly); pot/trap (baited, passive use); net (including scoop and drag/seine nets); dive collection (spearfishing and hand collection by snorkel, scuba or hookah); and other methods (e.g., other hand collection and the use of pumps and spades).

Region

For reporting of data collected by the TD Survey, specific location details recorded by diarists were categorised into six fishing regions, reflecting the three major drainage basins of NSW for freshwater systems (Argent, 2016), and the three major coastal regions defined for the Marine Estate of NSW (NSW Marine Estate Management Authority, 2018).

Freshwater drainage basins include:

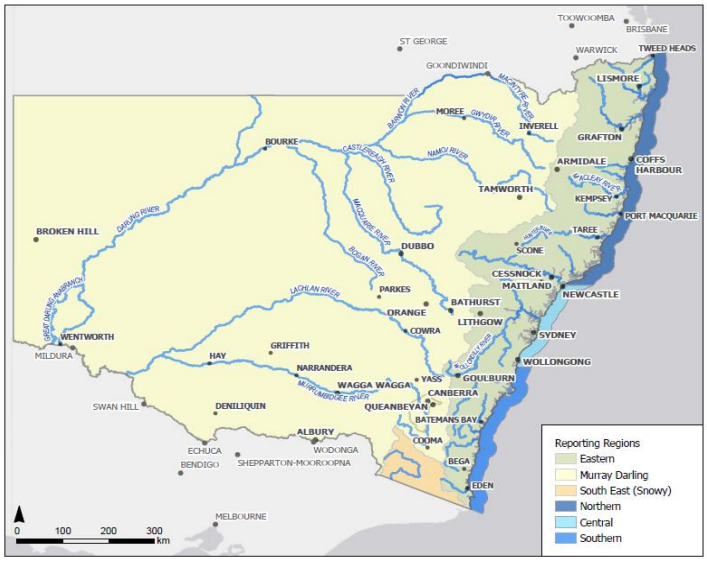
1) Eastern – East of the Great Dividing Range;

2) Murray-Darling – West of the Great Dividing Range and includes the waters of the Murray-Darling Basin and waterbodies within the ACT;

3) South East – includes the majority of the Snowy Mountains region.

Saltwater coastal regions include all estuarine, coastal (e.g. headlands and beaches) and marine habitats:

4) Northern – Queensland-NSW border to Stockton (just north of Newcastle);



Fishing regions used for reporting RFMP TD survey

6) Central – Stockton to Shellharbour (just south of Wollongong);

6) Southern – Shellharbour to the NSW-Victorian Border

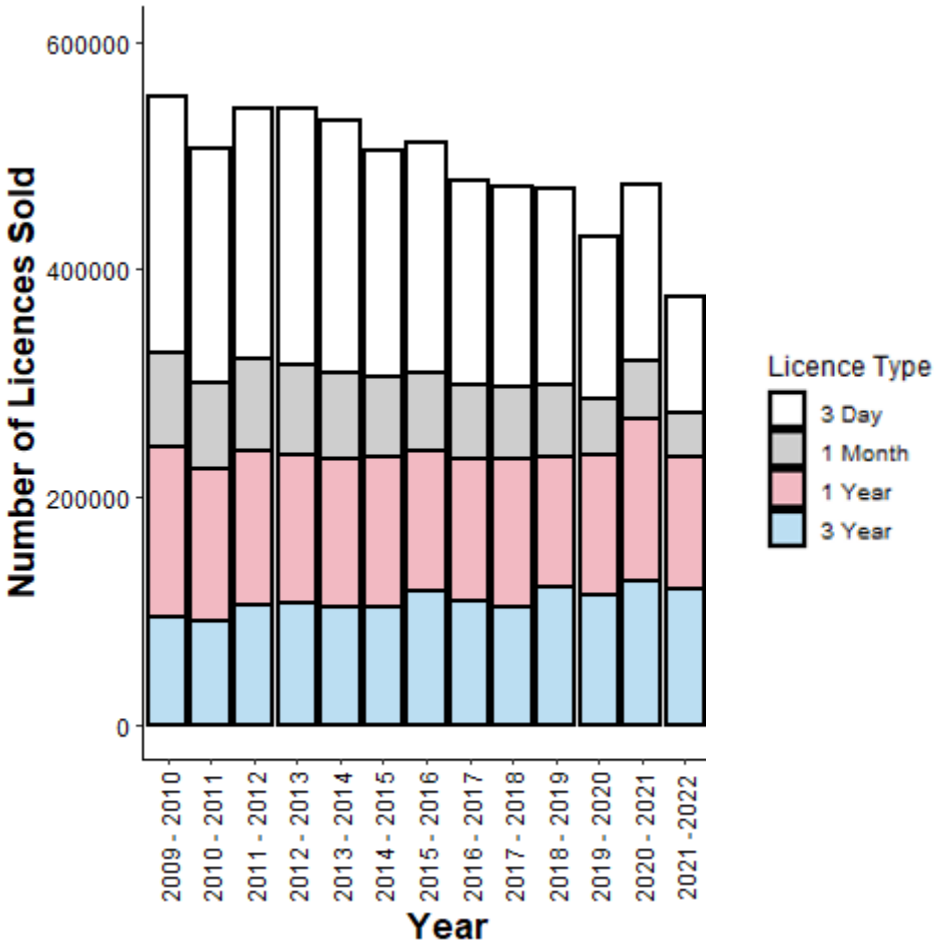
Catch – numbers of fish and invertebrates

Estimates of catch recorded during 2021/22 are aggregated on a state-wide basis and displayed for all species combined, and by major finfish and invertebrate categories. Also, 20 species/groups have been separately assessed in the chapter 'Report Cards for key species' (p. 39-58). These report cards present graphical summaries of the numbers kept and released for the 2021/22 TD Survey by waterbody, platform, method and region, as well as for the three previous TD surveys on a state-wide basis (West et al., 2015; Murphy et al., 2020; Murphy et al., 2022). These 'report card' results are presented on a single page for the convenience of the reader.

Results

NSW Recreational Fishing Fee Receipt sales

Summary of NSW Recreational Fishing Fee Receipt sales 2009-2010 – 2021-2022



Broad RFMP Telephone-Diary Survey statistics

Summary of RFMP Telephone-Diary Survey statistics through time

Survey details	2013/14	2017/18	2019/20	2021/22
No. active long-term licence holders in NSW	392,194* (as at 1/11/2012)	432,218 (as at 31/03/2017)	430,223 (as at 31/03/2019)	460,436^ (as at 31/03/2021)
Screening Survey				
No. of RFL households contacted (net sample)	1,882	1,960	1,990	1,967
No. of responses (rate)	1,686 (89.6%)	1,618 (82.6%)	1,608 (80.8%)	1,612 (82.0%)
No. RFL household residents (≥ 5 years old) profiled	4,656	4,335	4,291	4,023
No. of RFL households eligible for Diary Survey	1,521	1,413	1,451	1,382
Diary Survey				
No. RFL households that commenced survey	1,445	1,312	1,319	1,159
No. of RFL households that completed survey	1,329	1,257	1,226	1,017
Total no. of residents (≥ 5 years old) surveyed	3,727	3,442	3,385	2,620
Total no. of person-based fishing events reported	14,458	10,951	7,396	6,421

^ A review of the RFMP was undertaken during the analysis phase of the 2021/22 survey that led to revision of an assumption related to expansion of the data collected during the TD survey to the long-term RFL (and their household) population). For previous surveys, it was assumed that Recreational Fishing Fee Receipts that expired between the 31st March (when the sample was drawn) and the beginning of July WOULD NOT be renewed. For the 2021/22 TD Survey (and for future surveys), it was assumed that licenses falling into this category WOULD be renewed, and were thus considered active. The value indicated here for 2021/22 reflects this assumption, with the change in the assumption being a primary reason for the increase in the number of *active long-term licence holders in NSW* relative to previous years. This may also have a minor impact (5-6% increase) on the 2021/22 catch numbers outlined in this report, as the expansion population is larger.

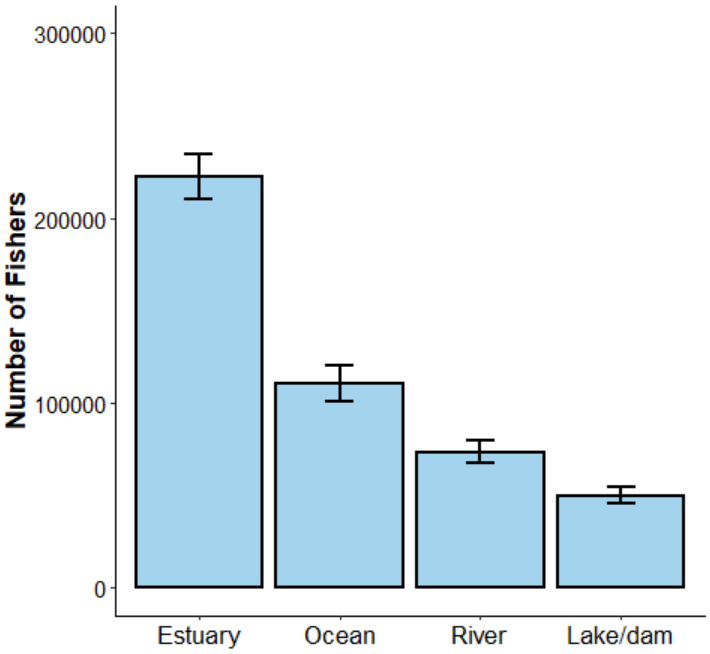
Participation – number of fishers

Participation by RFL household residents who fished within NSW through time

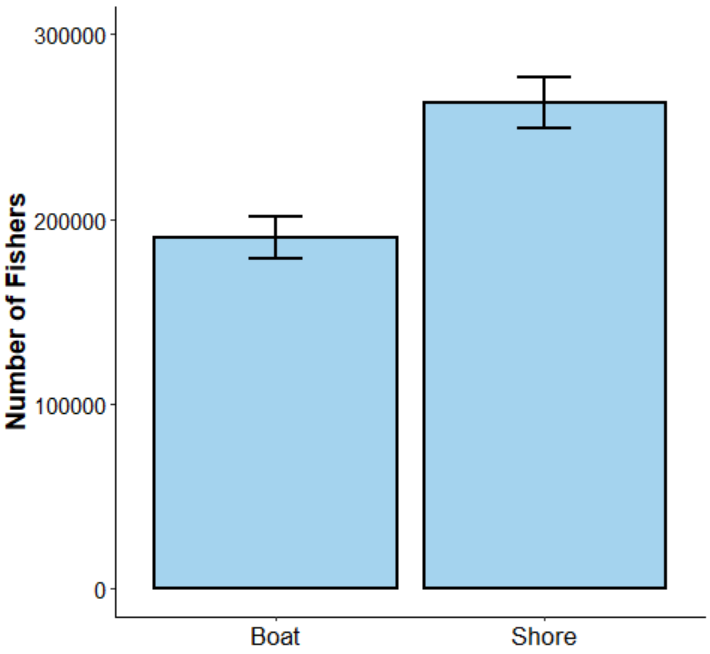
	2013/14*		2017/18		2019/20		2021/22^	
	Number	RSE (%)	Number	RSE (%)	Number	RSE (%)	Number	RSE (%)
FRESHWATER								
Total Persons	193,215	6	145,373	6	98,481	7	101,078	7
Total Households	117,088	5	90,331	5	63,090	6	64,052	6
SALTWATER								
Total Persons	334,372	4	304,434	5	255,674	4	273,875	5
Total Households	207,699	3	183,030	4	155,518	4	165,952	4
TOTAL**								
Total Persons	442,797	3	392,484	4	321,115	4	339,333	4
Total Households	262,485	2	231,985	3	193,916	3	203,828	3

** Note: The numbers of fishers or households who fished in freshwater and saltwater are not directly additive, as some fished both.

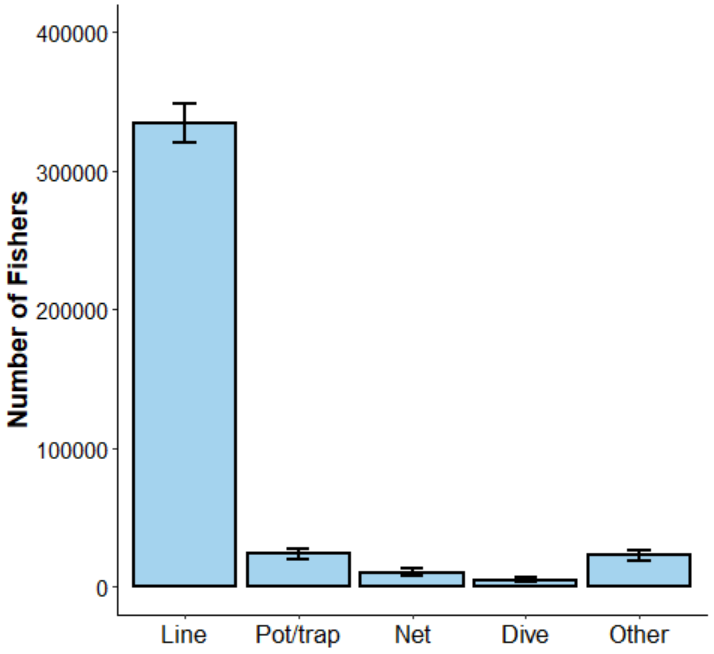
Participation by Waterbody for RFL households during 2021/22



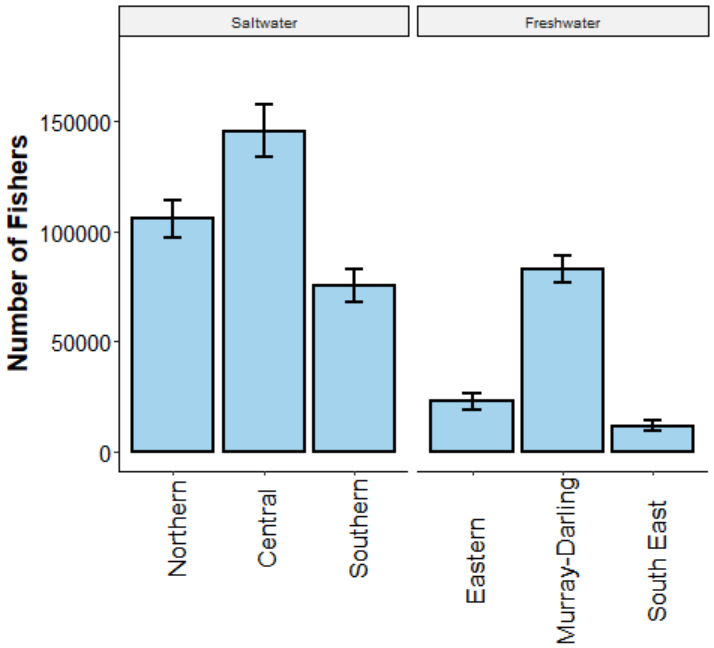
Participation by Platform for RFL households during 2021/22



Participation by Method for RFL households during 2021/22

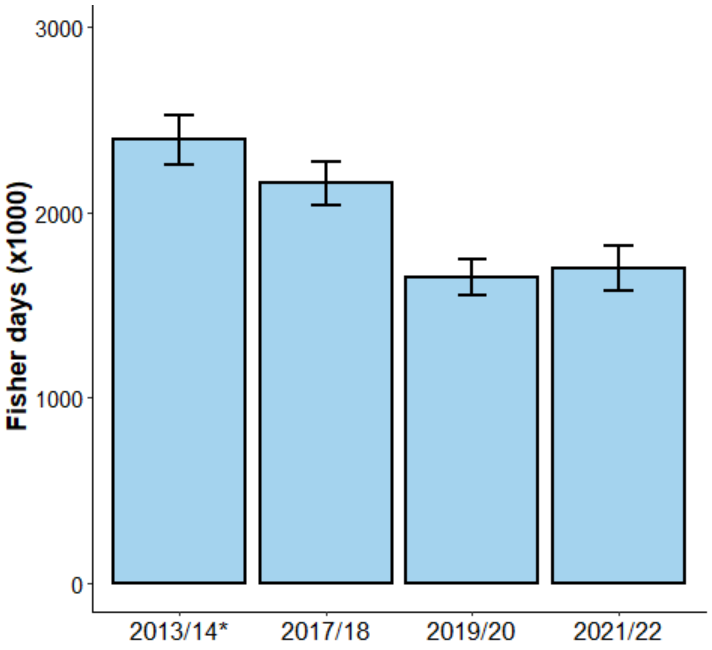


Participation by Region for RFL households during 2021/22



Fishing effort – number of fisher-days

Total state-wide fishing effort through time

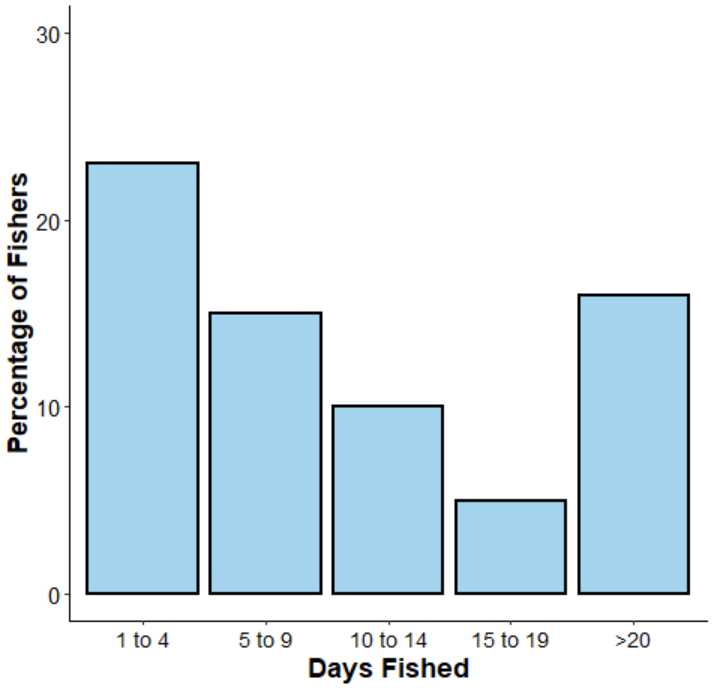


Fishing effort by RFL household residents who fished in NSW within freshwater and saltwater during 2021/22

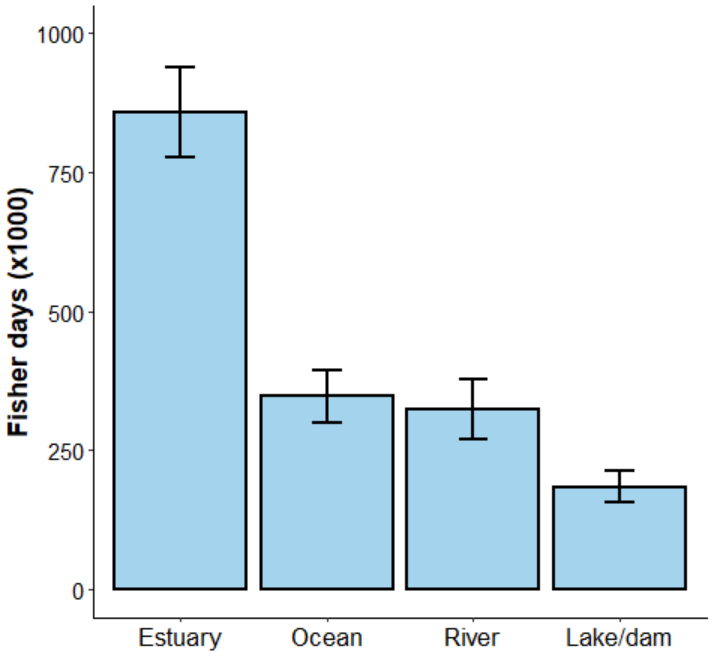
	Freshwater		Saltwater		Total**	
	Number	RSE (%)	Number	RSE (%)	Number	RSE (%)
Effort (Fisher-days)	509,156	13.0	1,190,508	8.2	1,699,665	7.3

**Note: The numbers of fisher days expended in freshwater and saltwater are not directly additive as some fishers fished both.

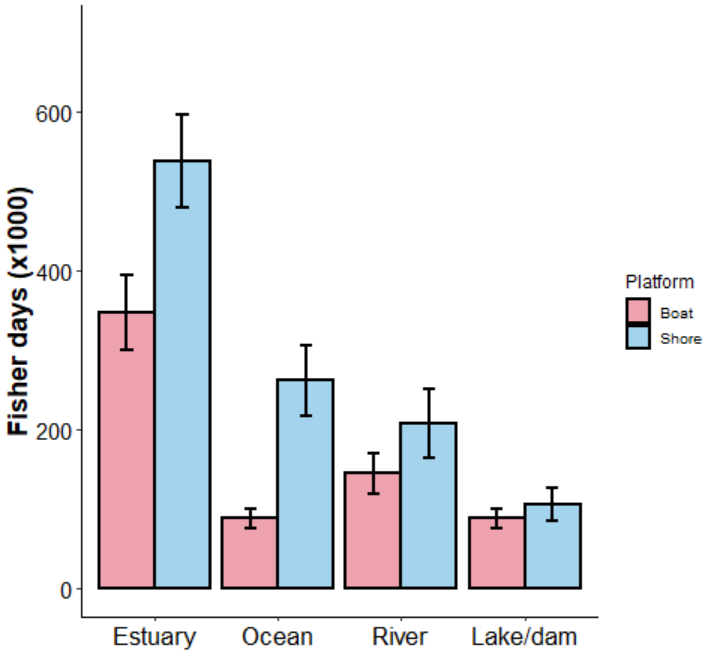
Days fished per year by avidity group for RFL households during 2021/22



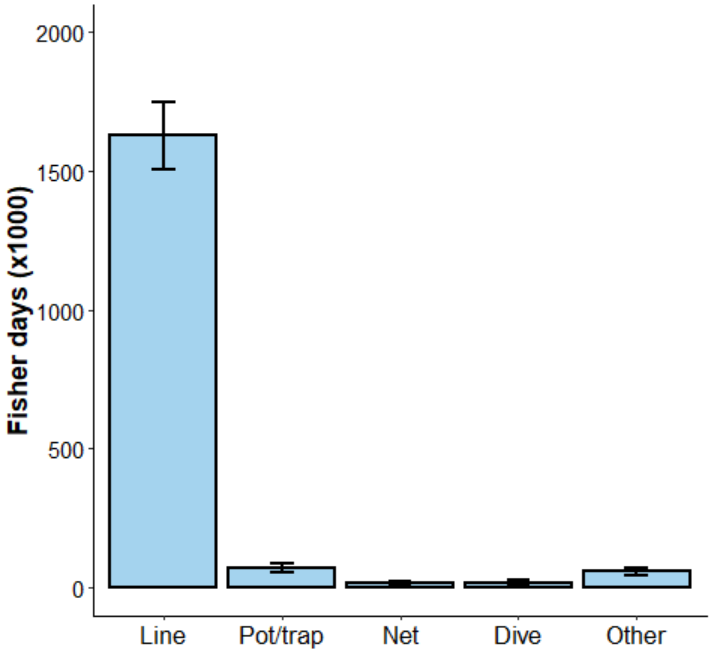
Fishing effort by Waterbody for RFL households during 2021/22



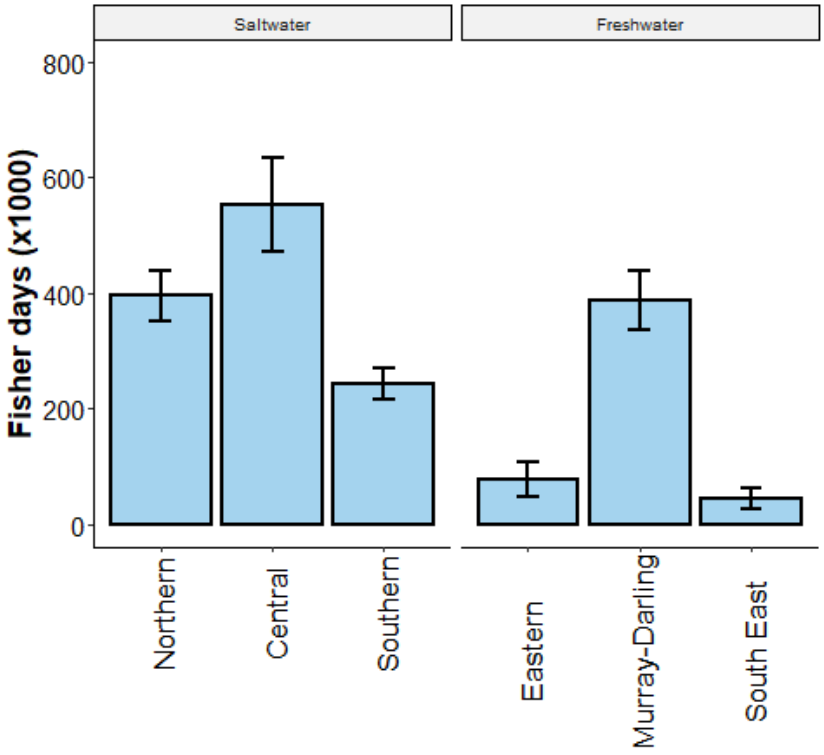
Fishing effort by Platform and Waterbody for RFL households during 2021/22



Fishing effort by Method for RFL households during 2021/22



Fishing effort by Region for RFL households during 2021/22

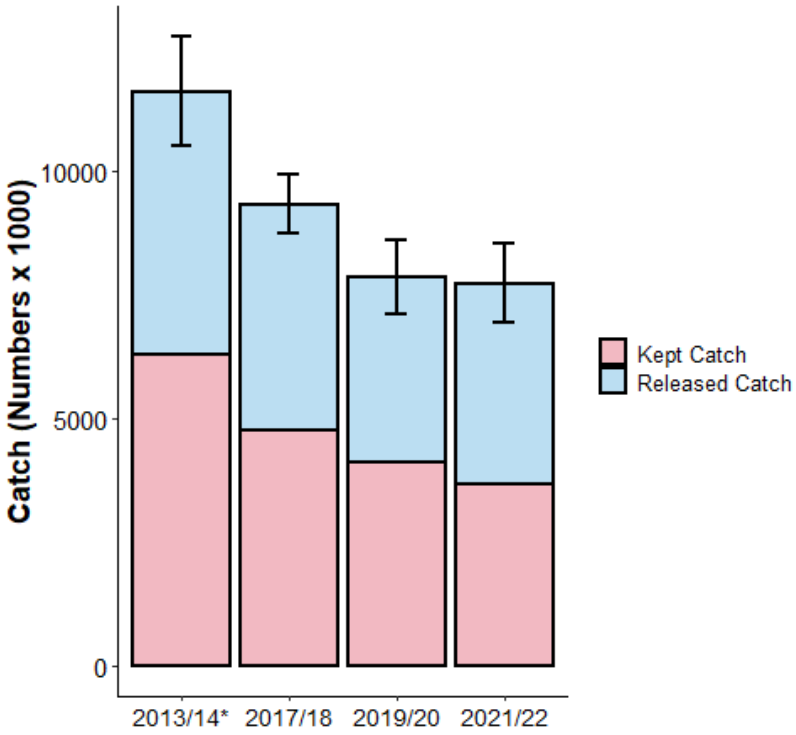


Catch – numbers of finfish and invertebrates

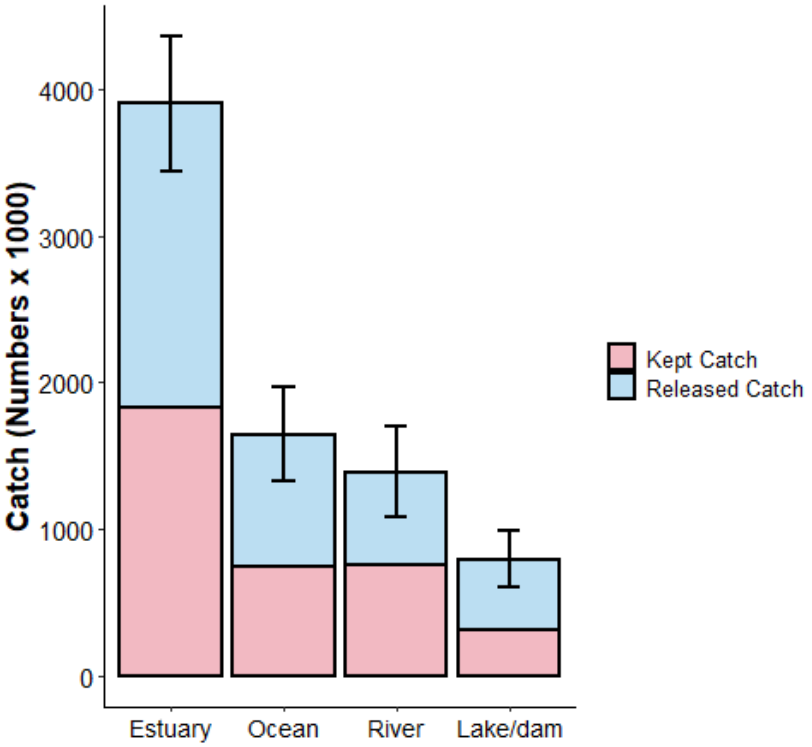
Recreational fishers in NSW caught a diverse range of finfish, elasmobranchs (sharks and rays), crustaceans, molluscs, and other taxa, with 123 species and species groupings caught during the 2021/22 TD Survey.

Overall, the total state-wide recreational catch of RFL households was estimated to be 7,736,592 (RSE 10.3%) individual organisms, with 3,658,098 being kept (47.3% of total catch) and the remaining 4,078,494 released (52.7% of total catch).

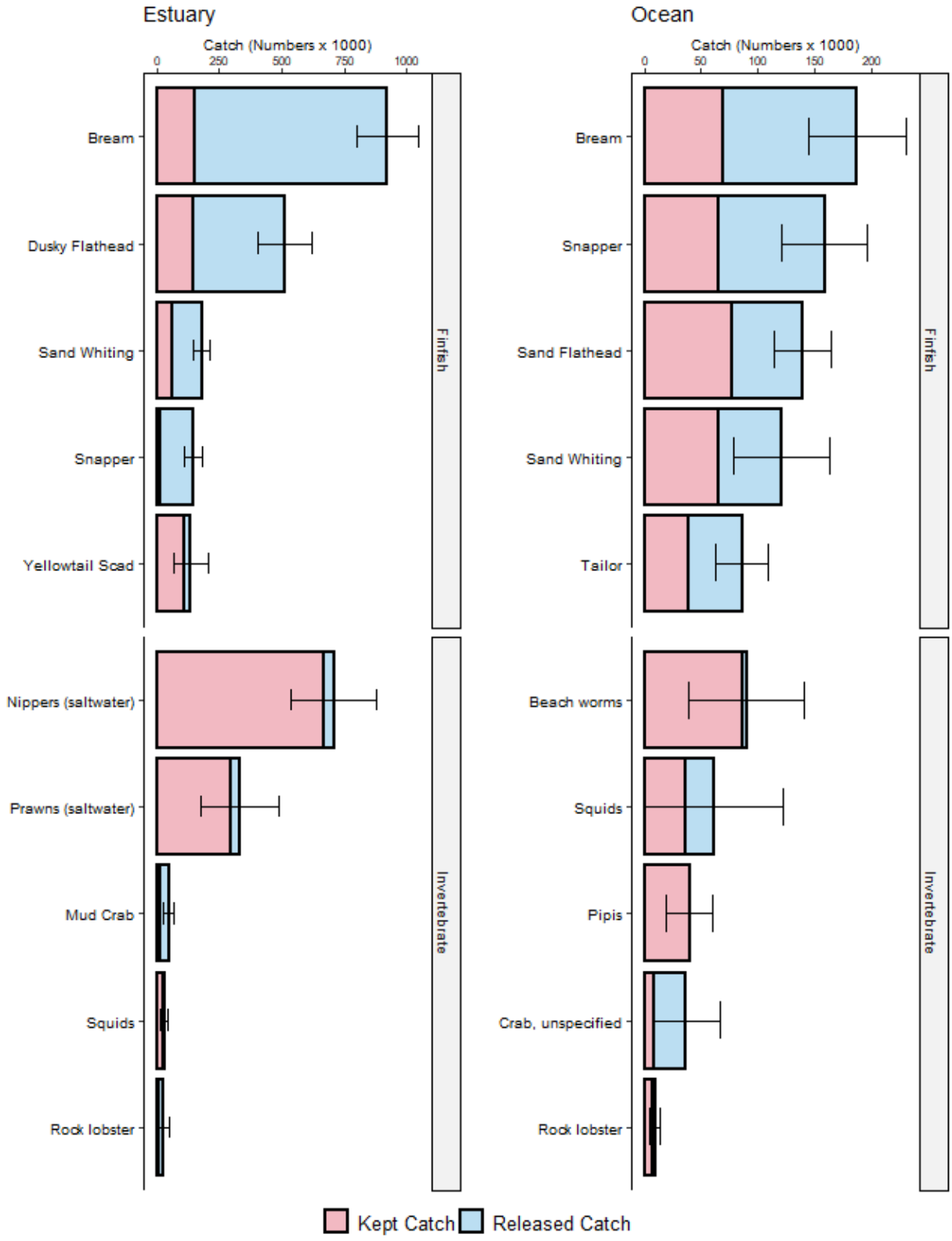
Total state-wide catch for RFL households through time (all species combined)



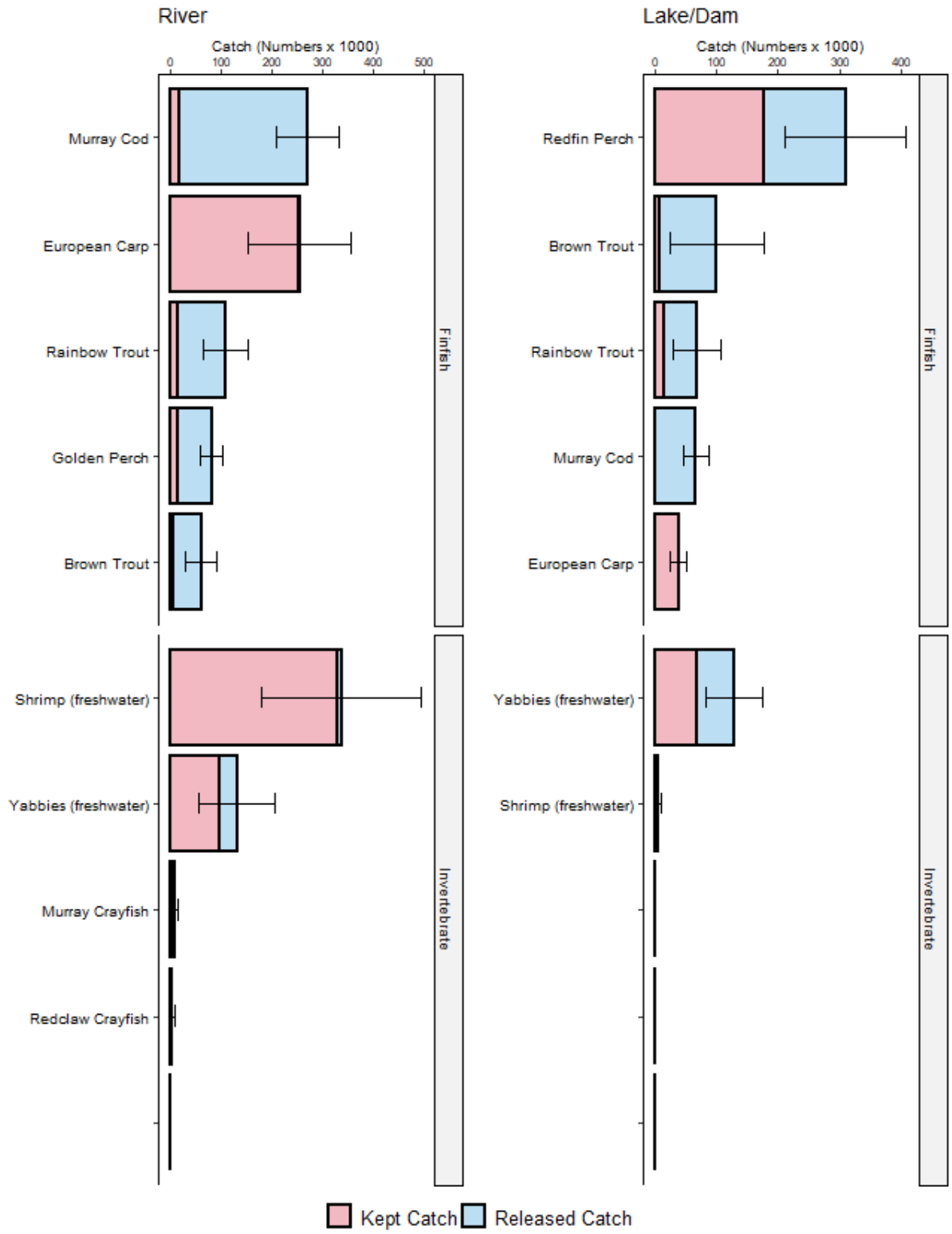
Total state-wide catch by Waterbody for RFL households during 2021/22 (all species combined)



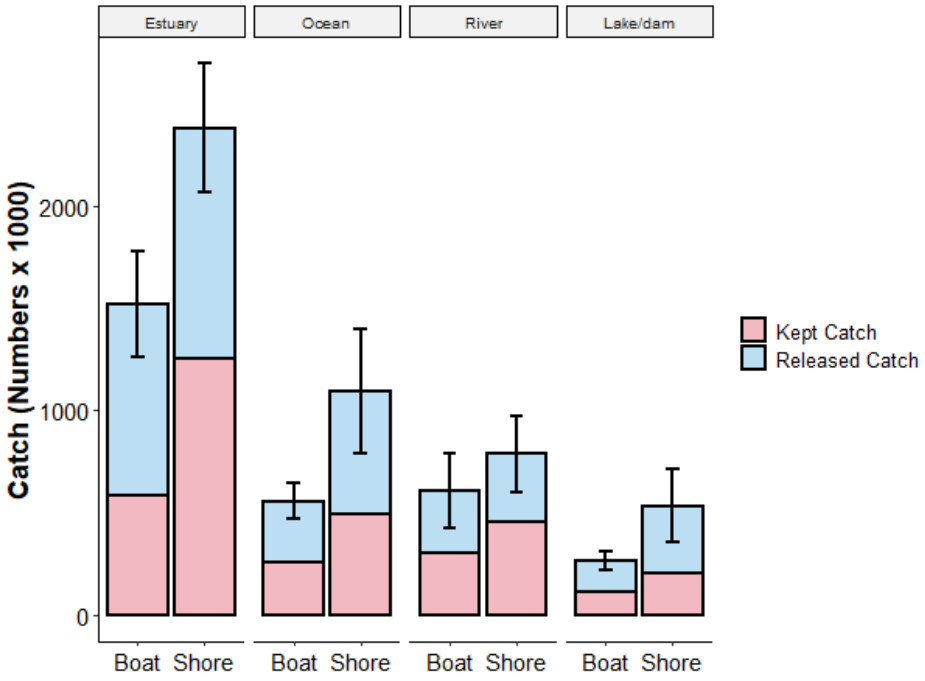
Total state-wide catch of top finfish and invertebrate species/groups by Waterbody (saltwater) for RFL households during 2021/22



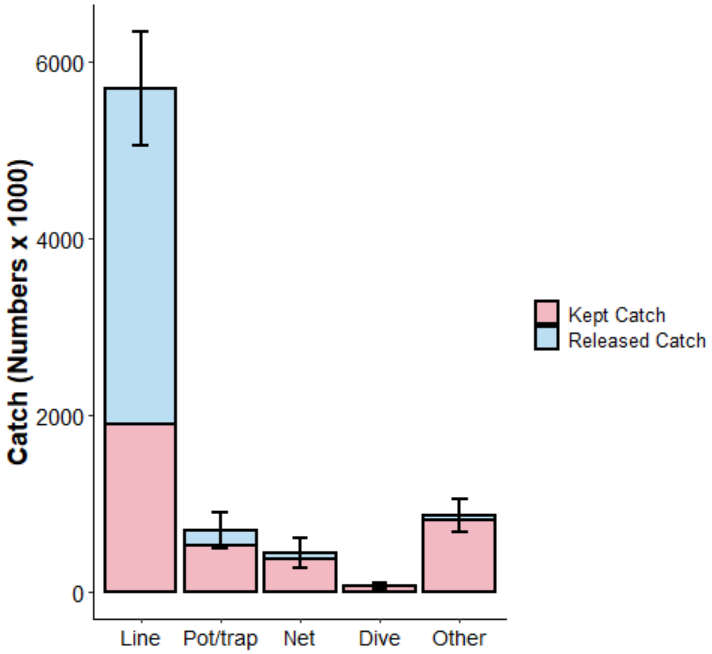
Total state-wide catch of top finfish and invertebrate species/groups by Waterbody (freshwater) for RFL households during 2021/22



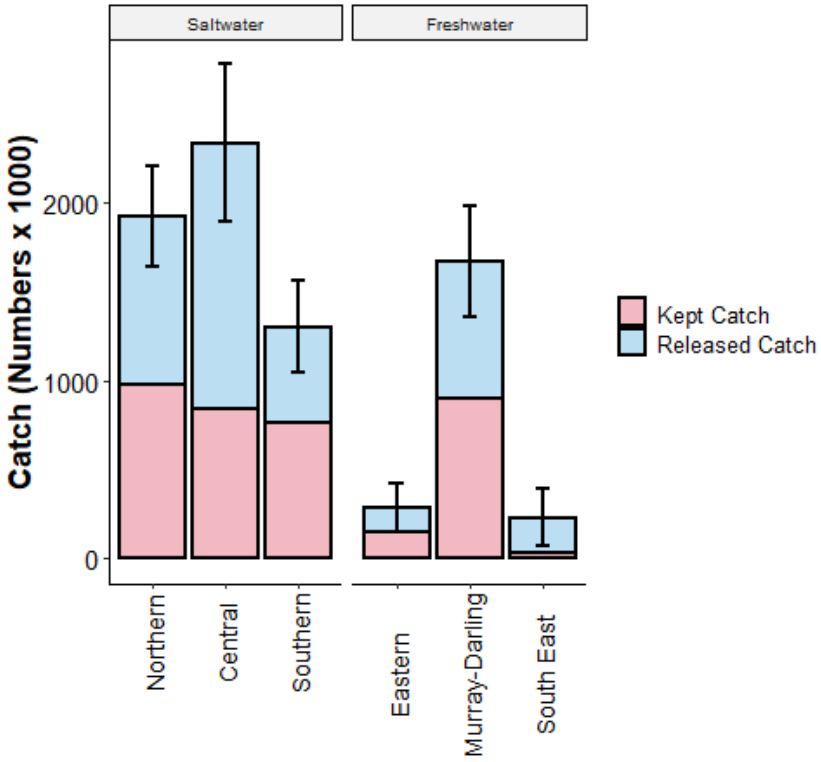
Total state-wide catch by Platform and Waterbody for RFL households during 2021/22 (all species combined)



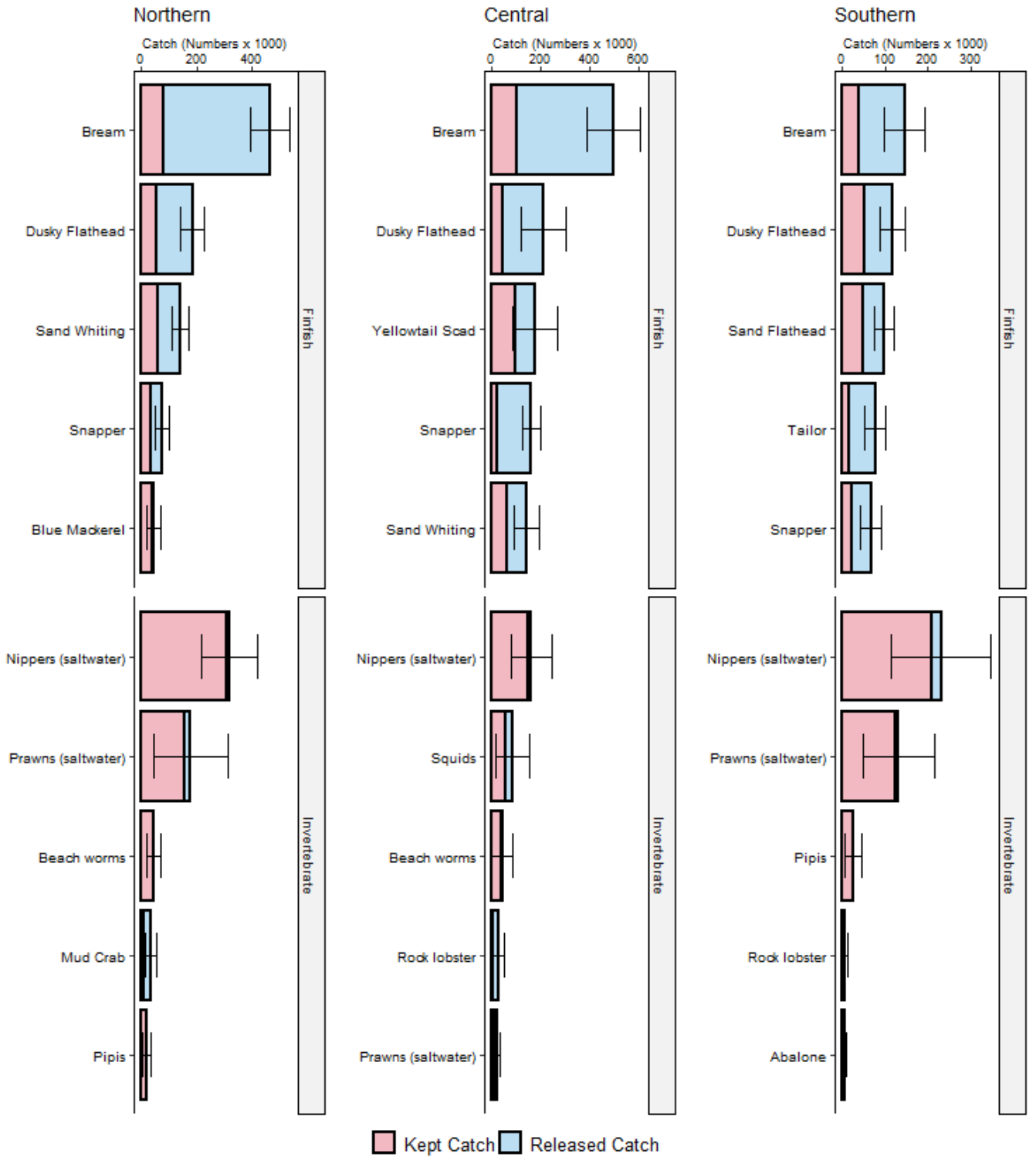
Total state-wide catch by Method for RFL households during 2021/22 (all species combined)



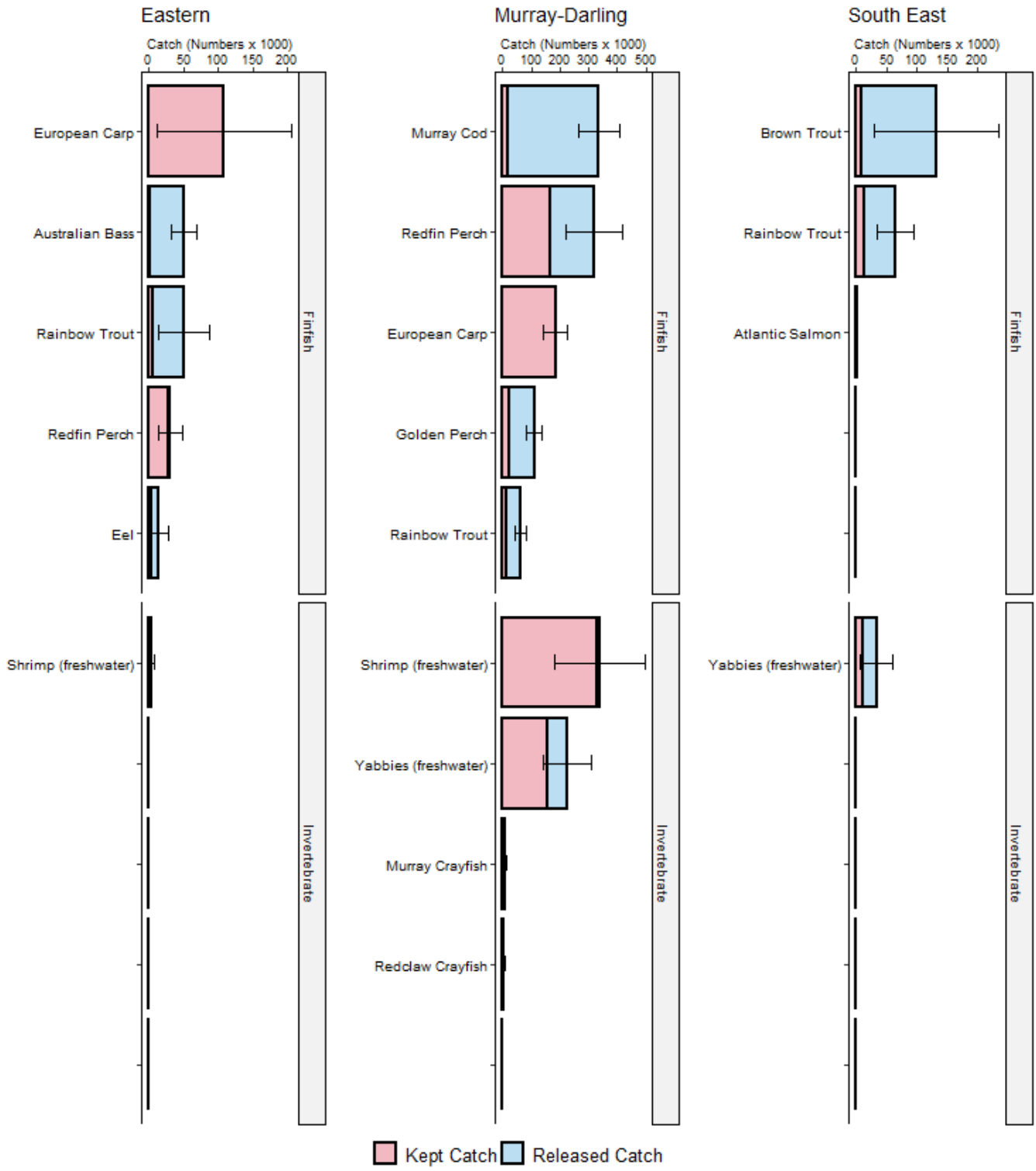
Total catch by Region for RFL households during 2021/22 (all species combined)



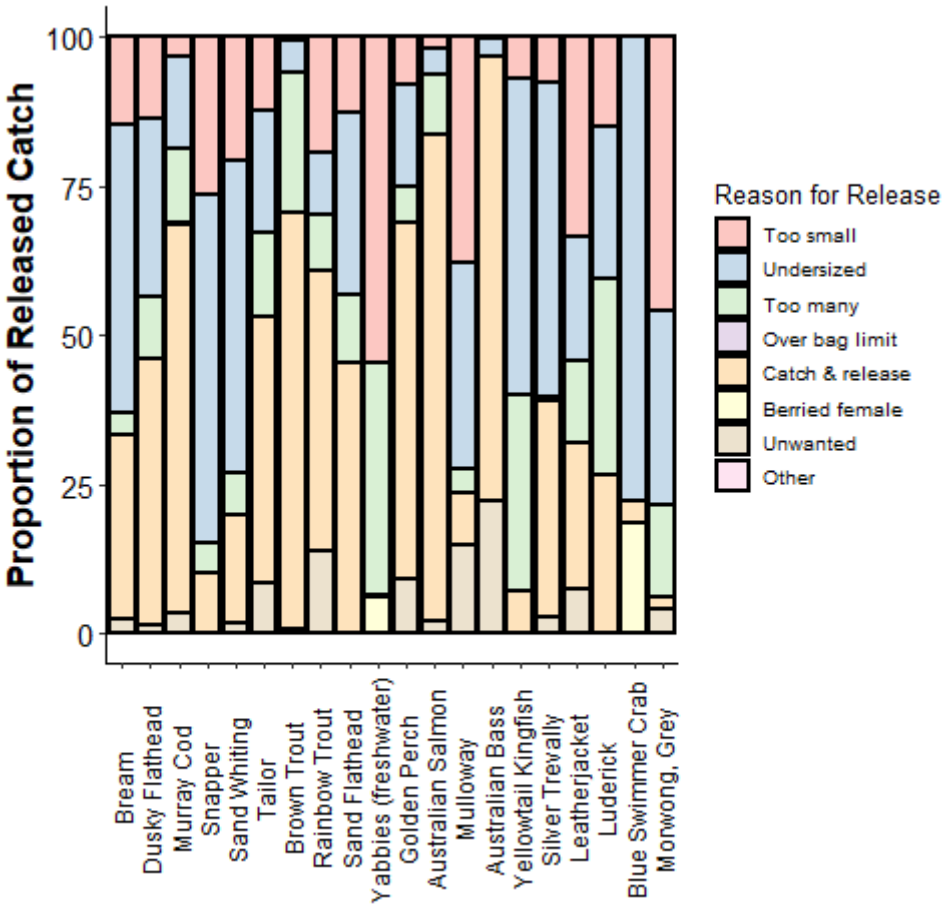
Total catch of top finfish and invertebrate species/groups by Region (saltwater) for RFL households during 2021/22



Total catch of top finfish and invertebrate species/groups by Region (freshwater) for RFL households during 2021/22



Reasons for release for key species released by RFL households during 2021/22

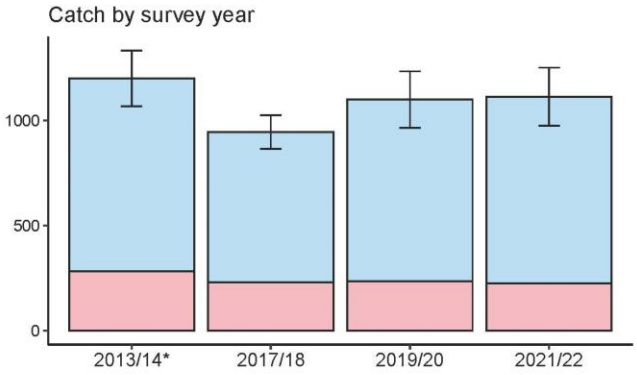


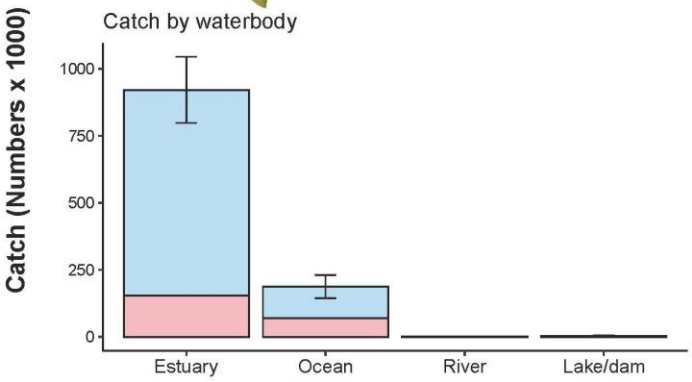
Report cards for key species

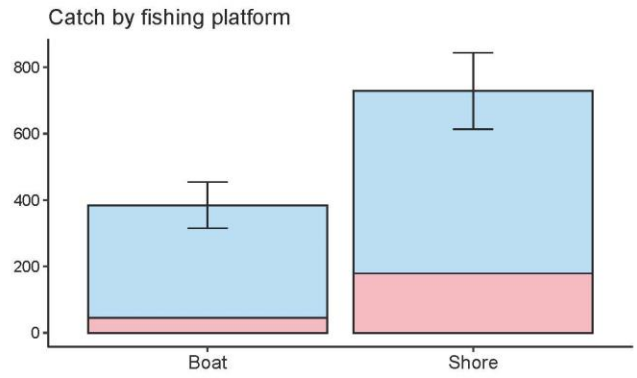
Bream - species complex

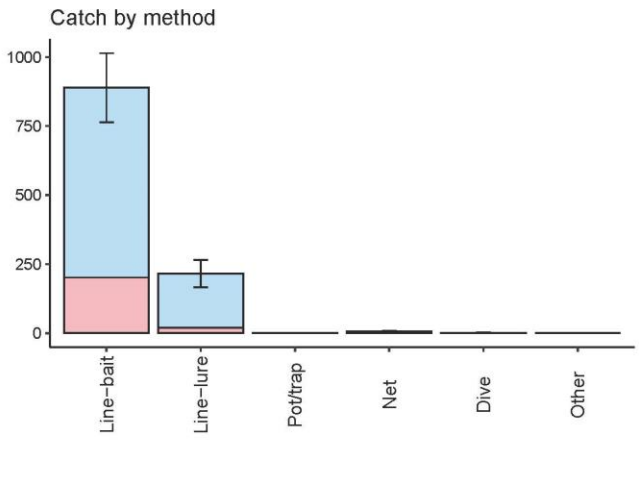
Bream

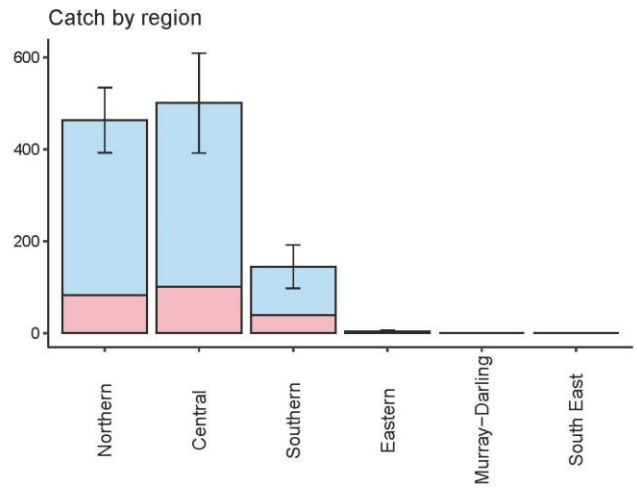
- 'Bream' is a species complex of Yellowfin Bream, Black Bream and their hybrids; with Yellowfin Bream dominating the state–wide catch for this group.
- Total state–wide catch was 1,112,741 (RSE = 12 %), with 20 % being kept and 80 % released during 2021/22.



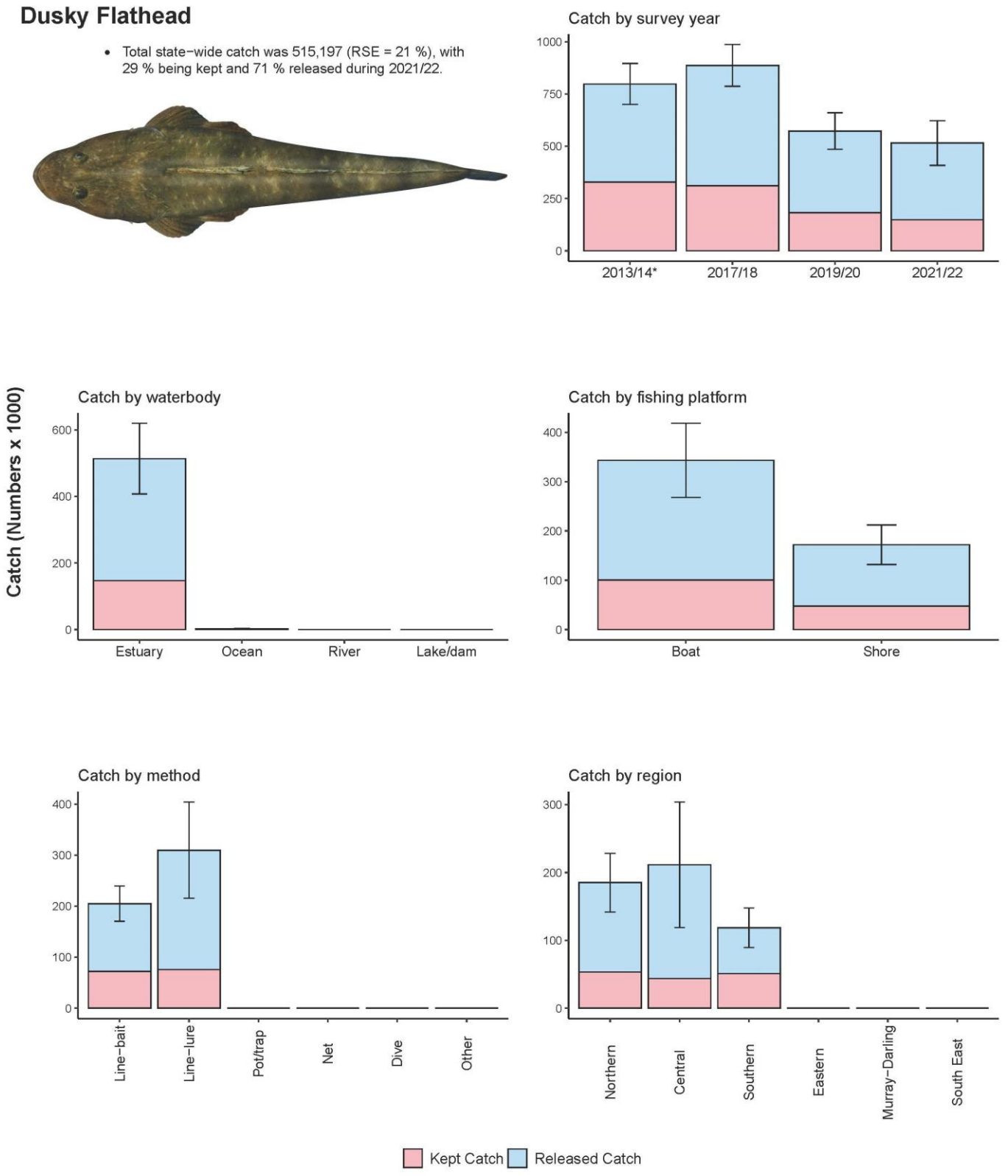








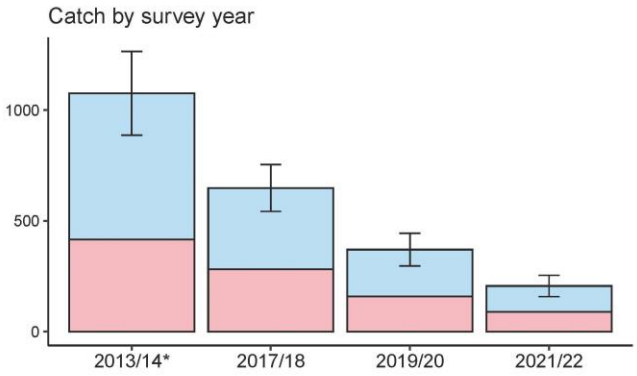
Dusky Flathead (*Platycephalus fuscus*)

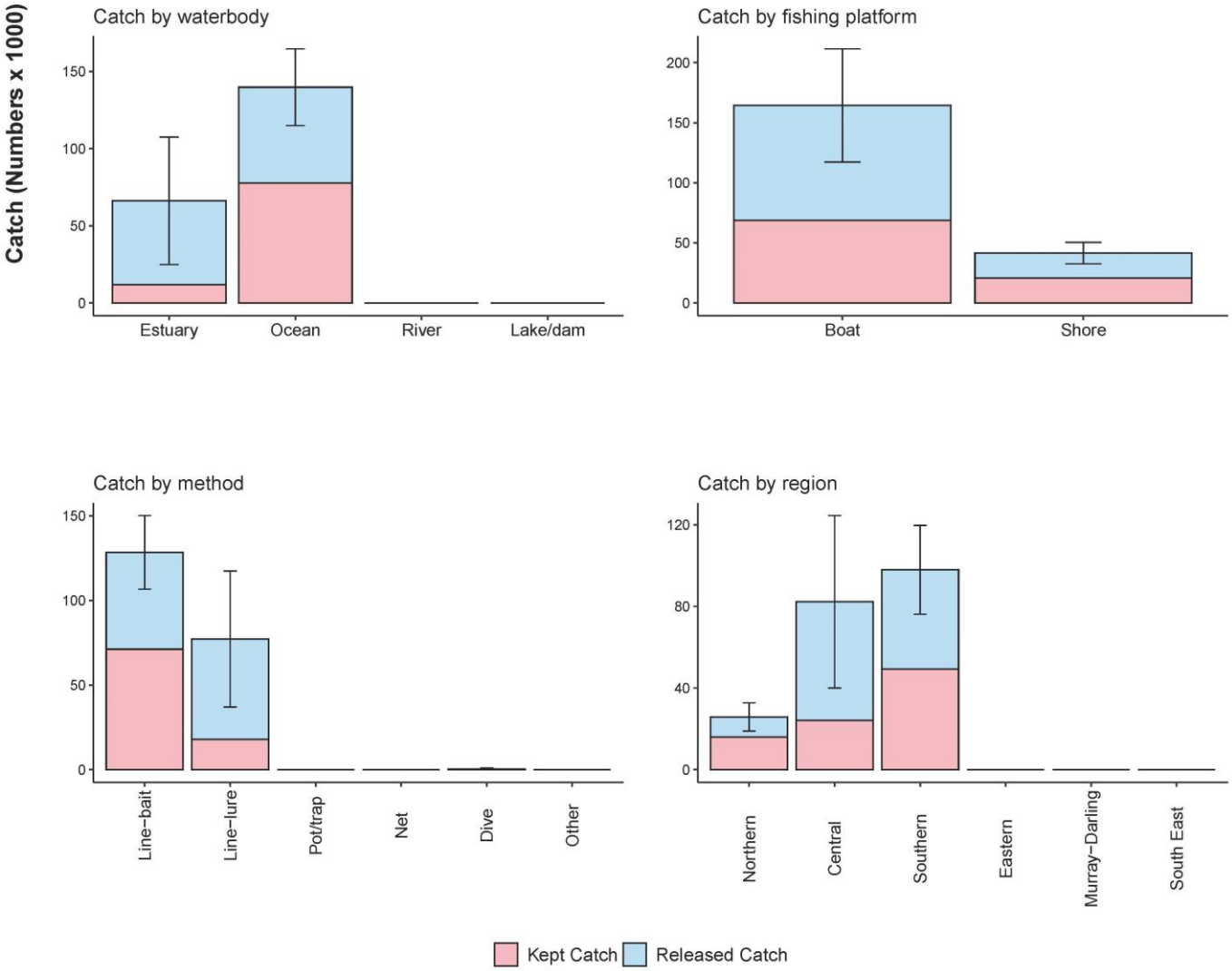


Sand Flathead - species complex

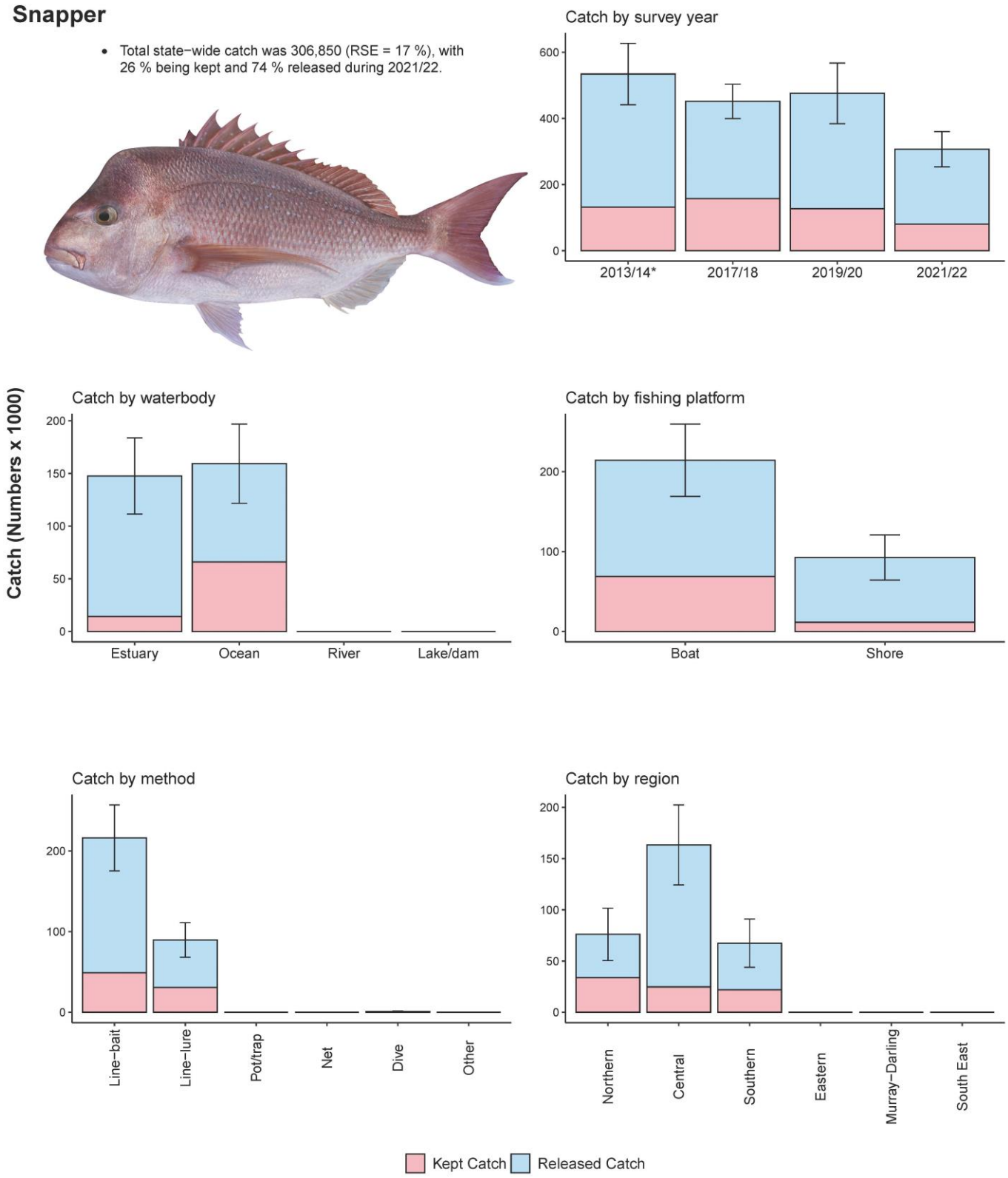
Sand Flathead

- Sand flathead' is a species complex of several Platycephalidae species; with Bluespotted Flathead dominating the state–wide catch for this group.
- Total state–wide catch was 205,964 (RSE = 23 %), with 43 % being kept and 57 % released during 2021/22.





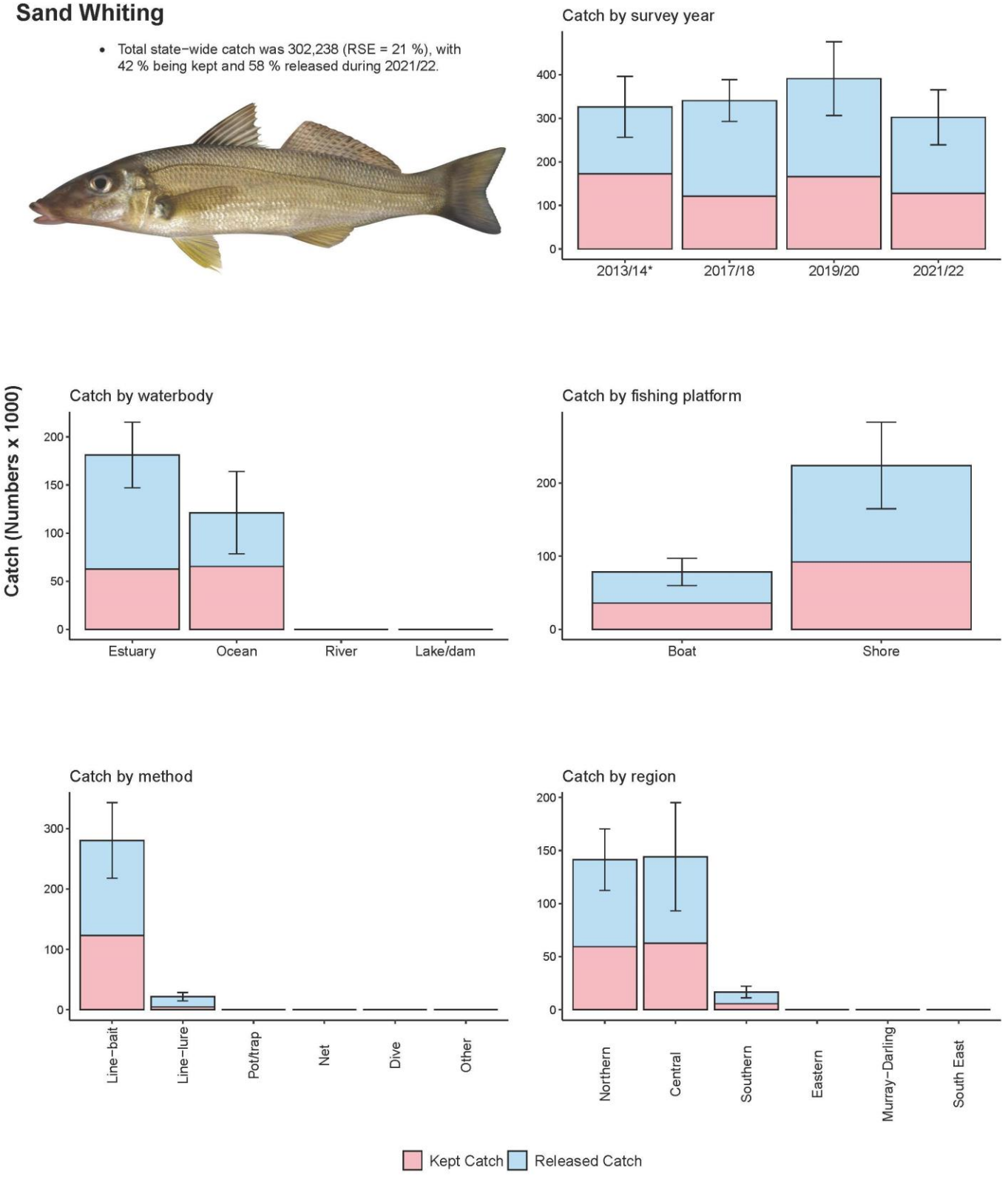
Snapper (*Chrysophrys auratus*)



Sand Whiting (*Sillago ciliata*)

Sand Whiting

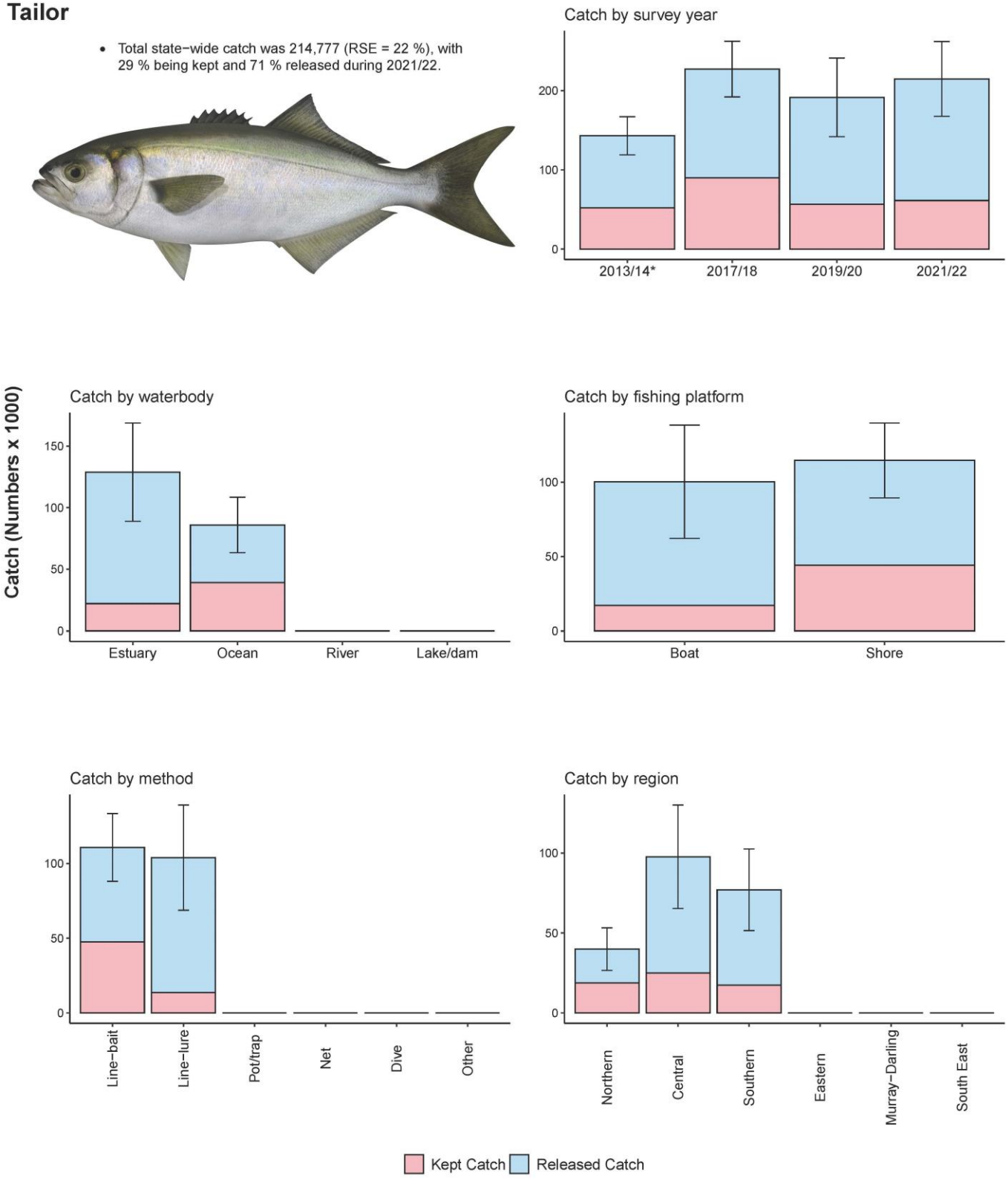
- Total state–wide catch was 302,238 (RSE = 21 %), with 42 % being kept and 58 % released during 2021/22.



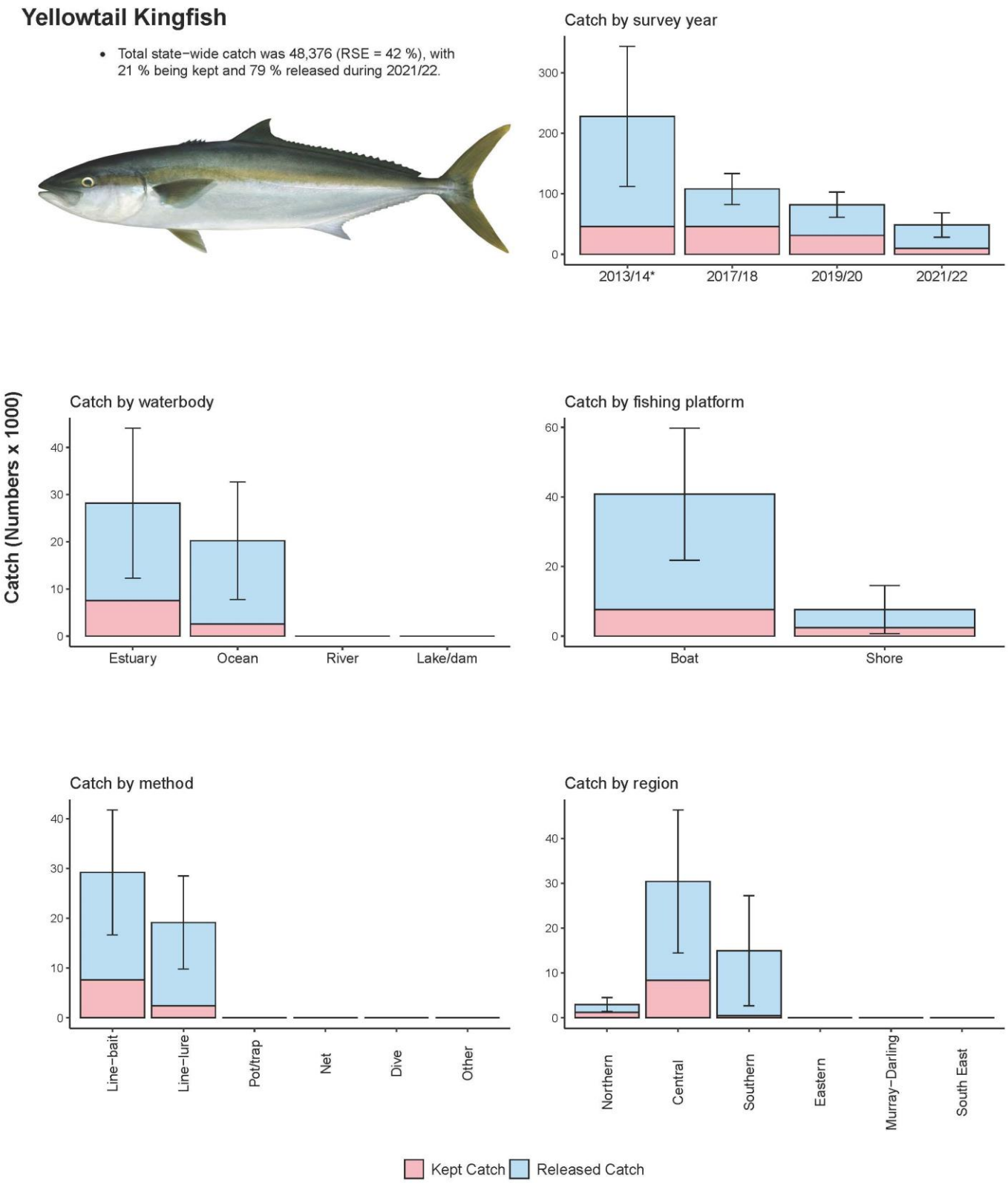
Tailor (*Pomatomus saltatrix*)

Tailor

- Total state–wide catch was 214,777 (RSE = 22 %), with 29 % being kept and 71 % released during 2021/22.



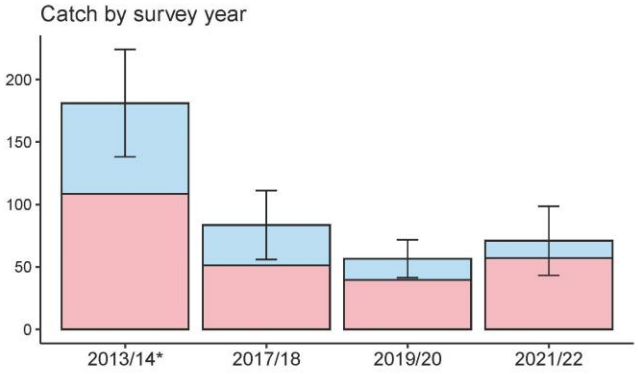
Yellowtail Kingfish (*Seriola lalandi*)

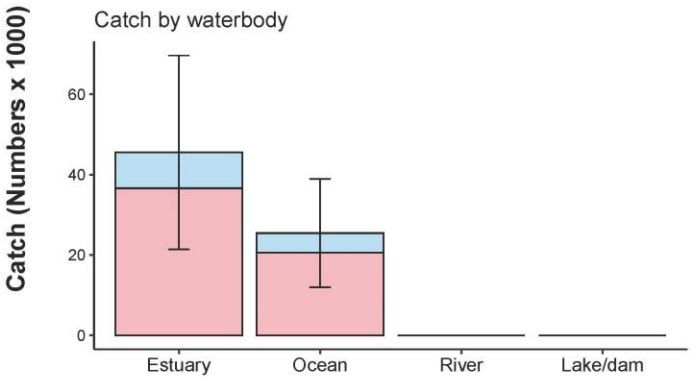


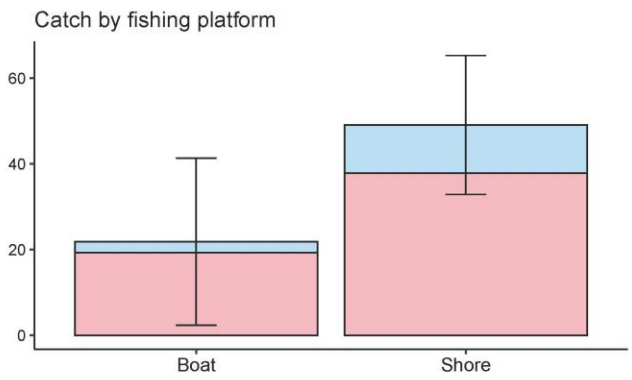
Luderick (*Girella tricuspidata*)

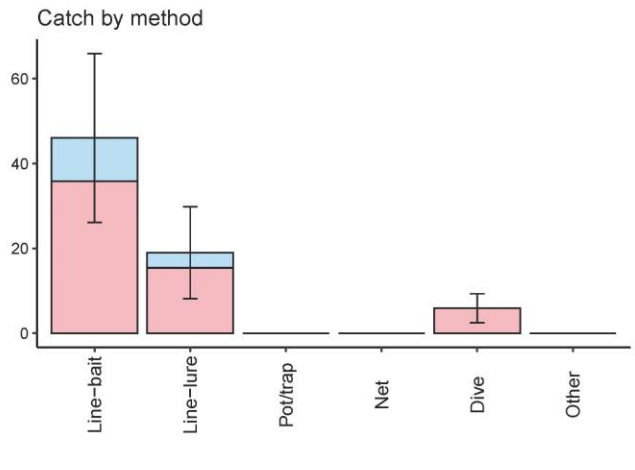
Luderick

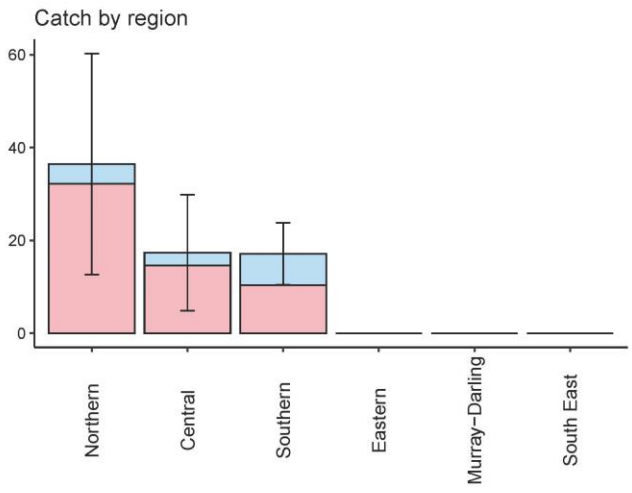
- Total state–wide catch was 70,960 (RSE = 39 %), with 81 % being kept and 19 % released during 2021/22.







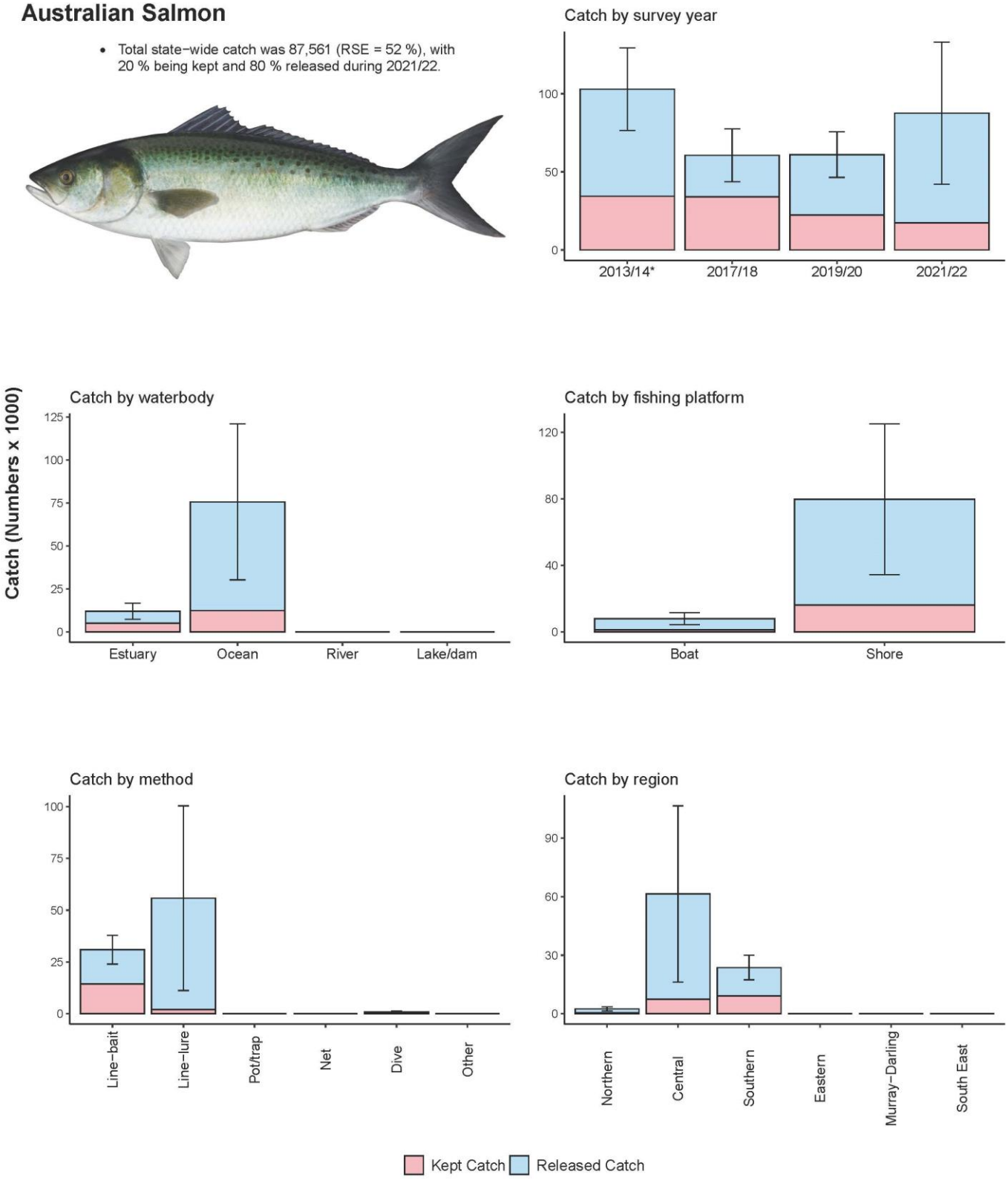




Australian Salmon (*Arripis trutta*)

Australian Salmon

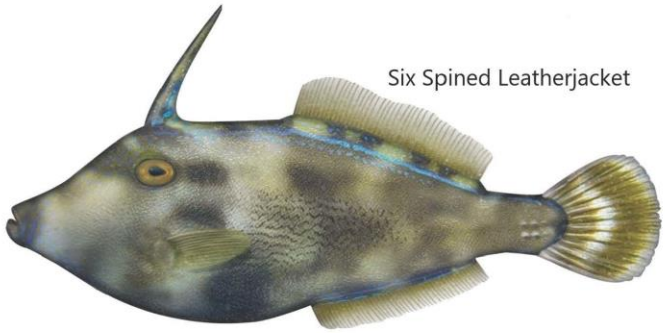
- Total state–wide catch was 87,561 (RSE = 52 %), with 20 % being kept and 80 % released during 2021/22.

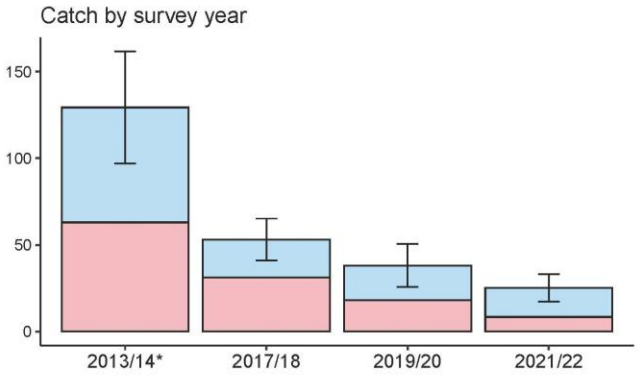


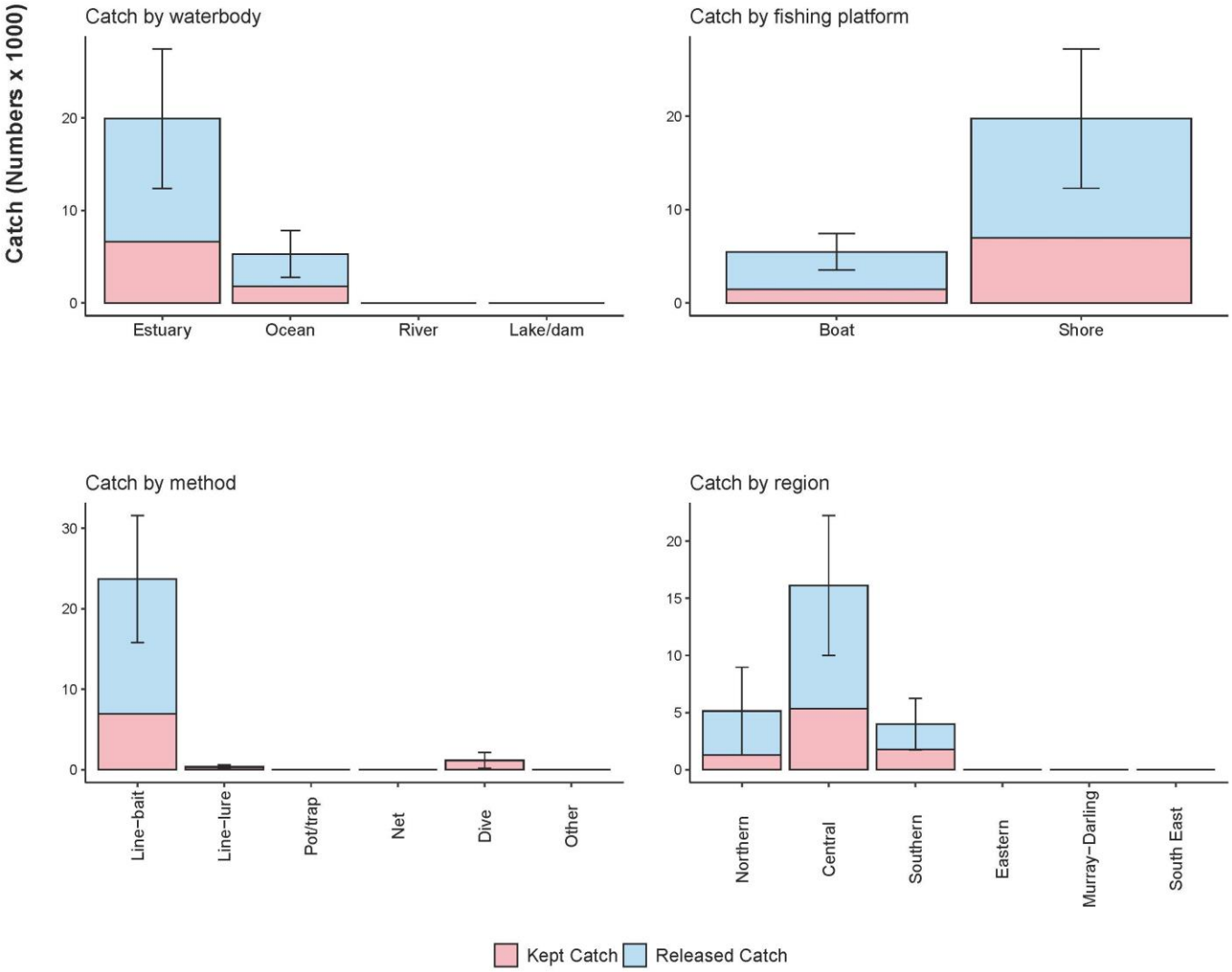
Leatherjacket - species complex

Leatherjacket

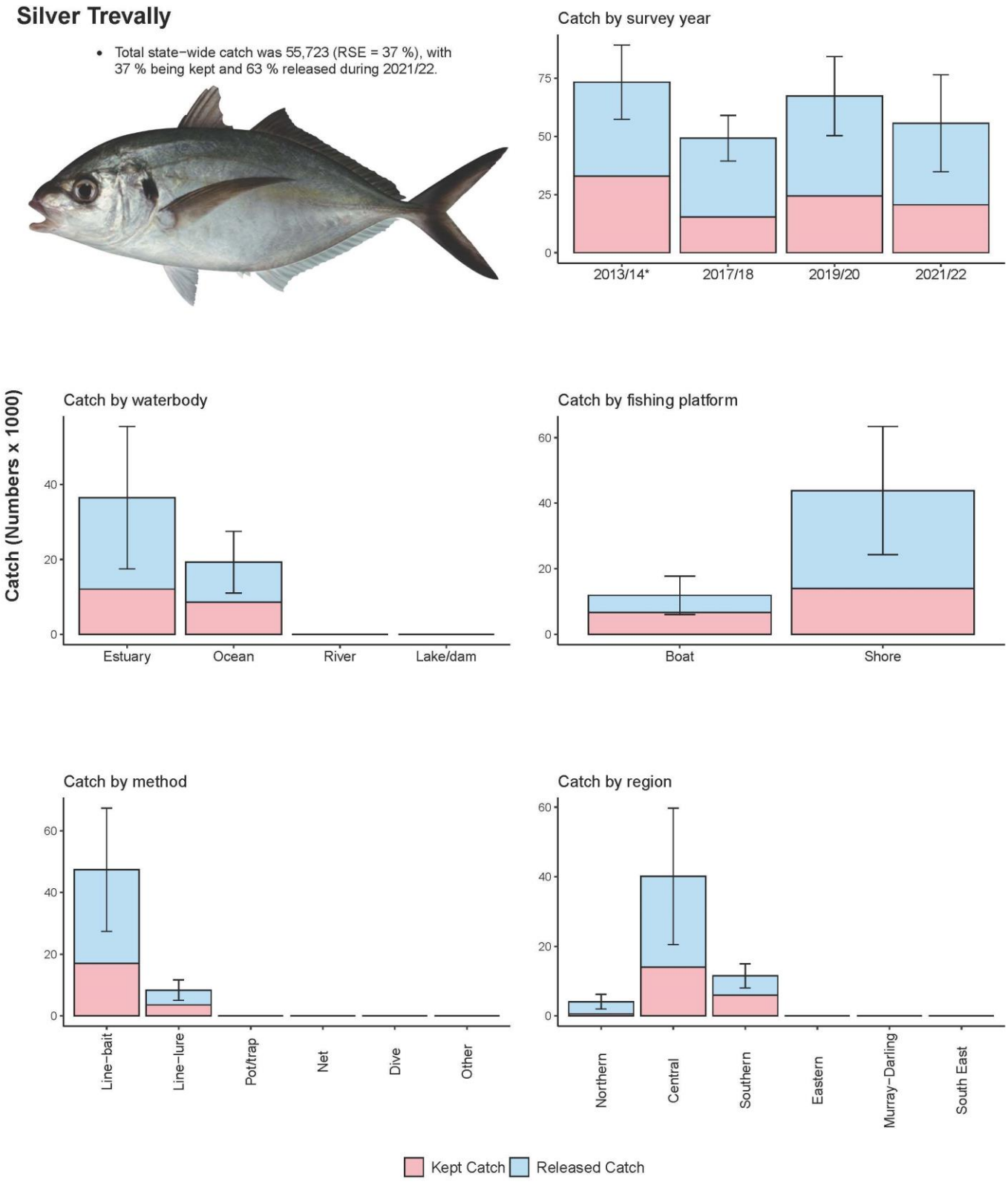
- 'Leatherjacket' is a species complex of several Balistidae and Monacanthidae species.
- Total state–wide catch was 25,228 (RSE = 31 %), with 33 % being kept and 67 % released during 2021/22.







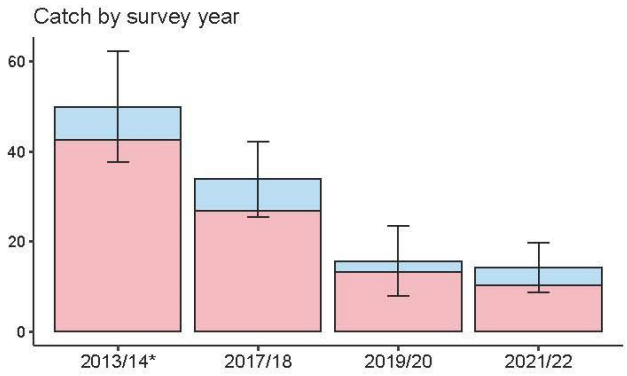
Silver Trevally (*Pseudocaranx georgianus*)

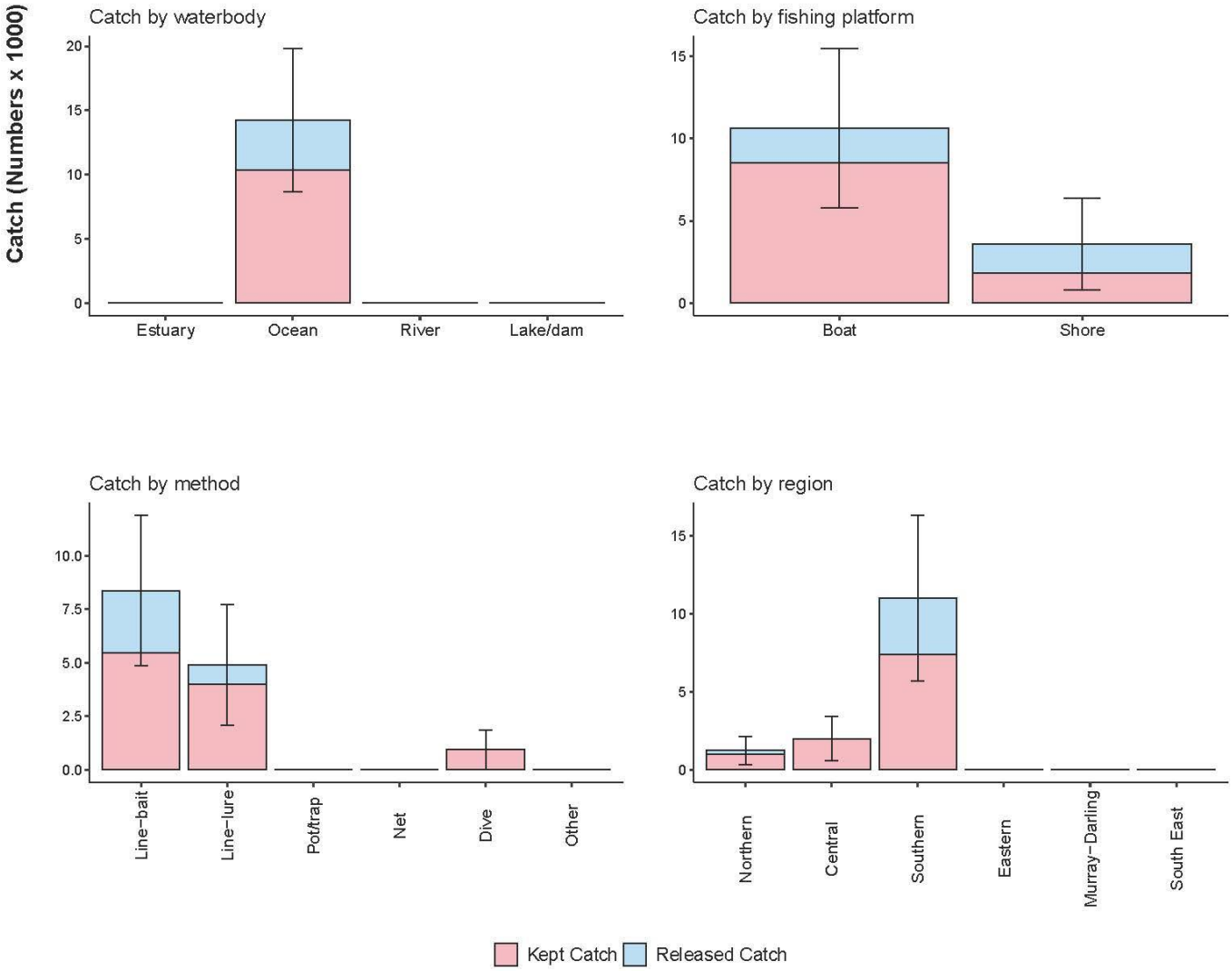


Grey Morwong (*Nemadactylus douglasii*)

Grey Morwong

- Total state–wide catch was 14,208 (RSE = 39 %), with 73 % being kept and 27 % released during 2021/22.

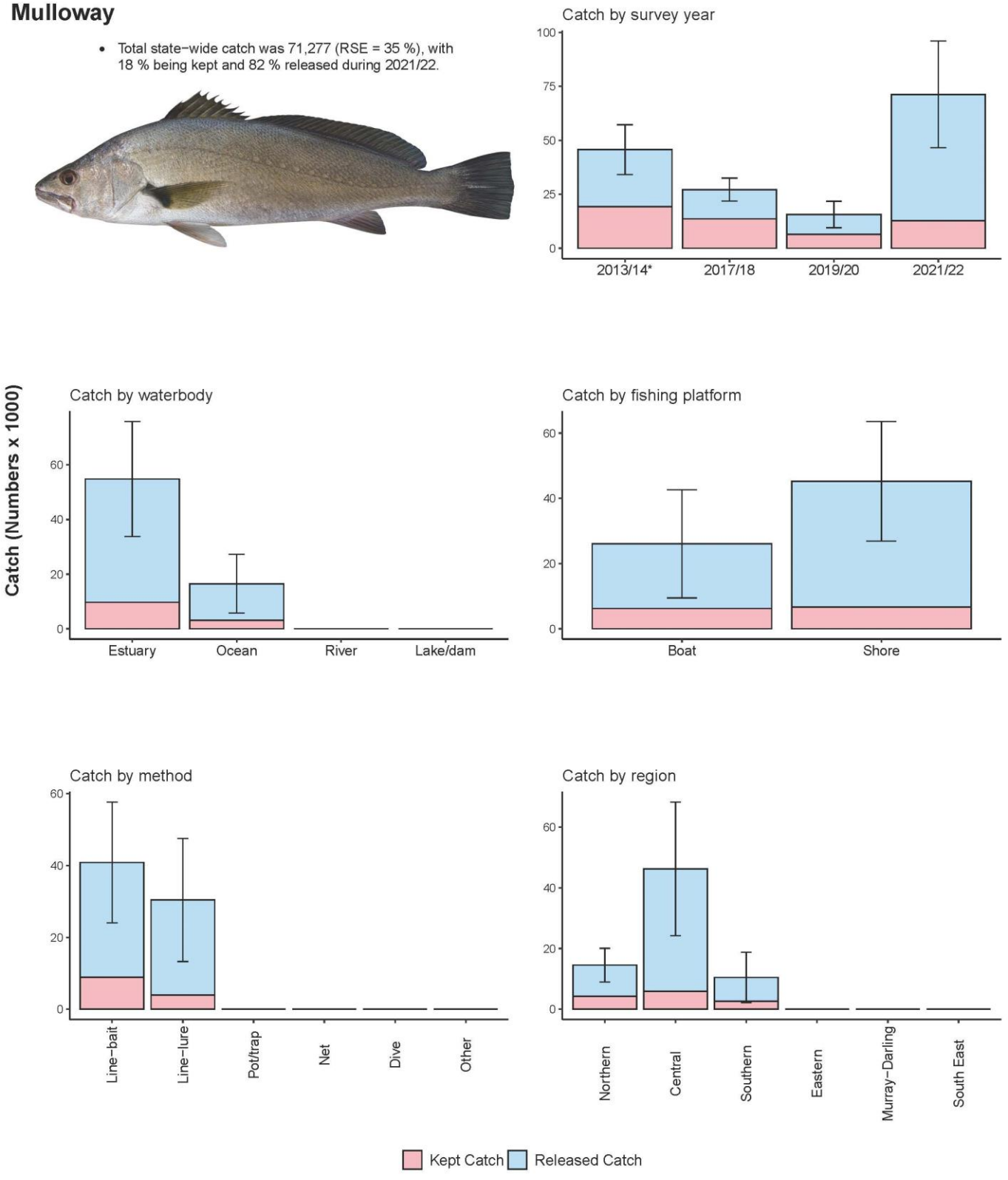




Mulloway (*Argyrosomus japonicus*)

Mulloway

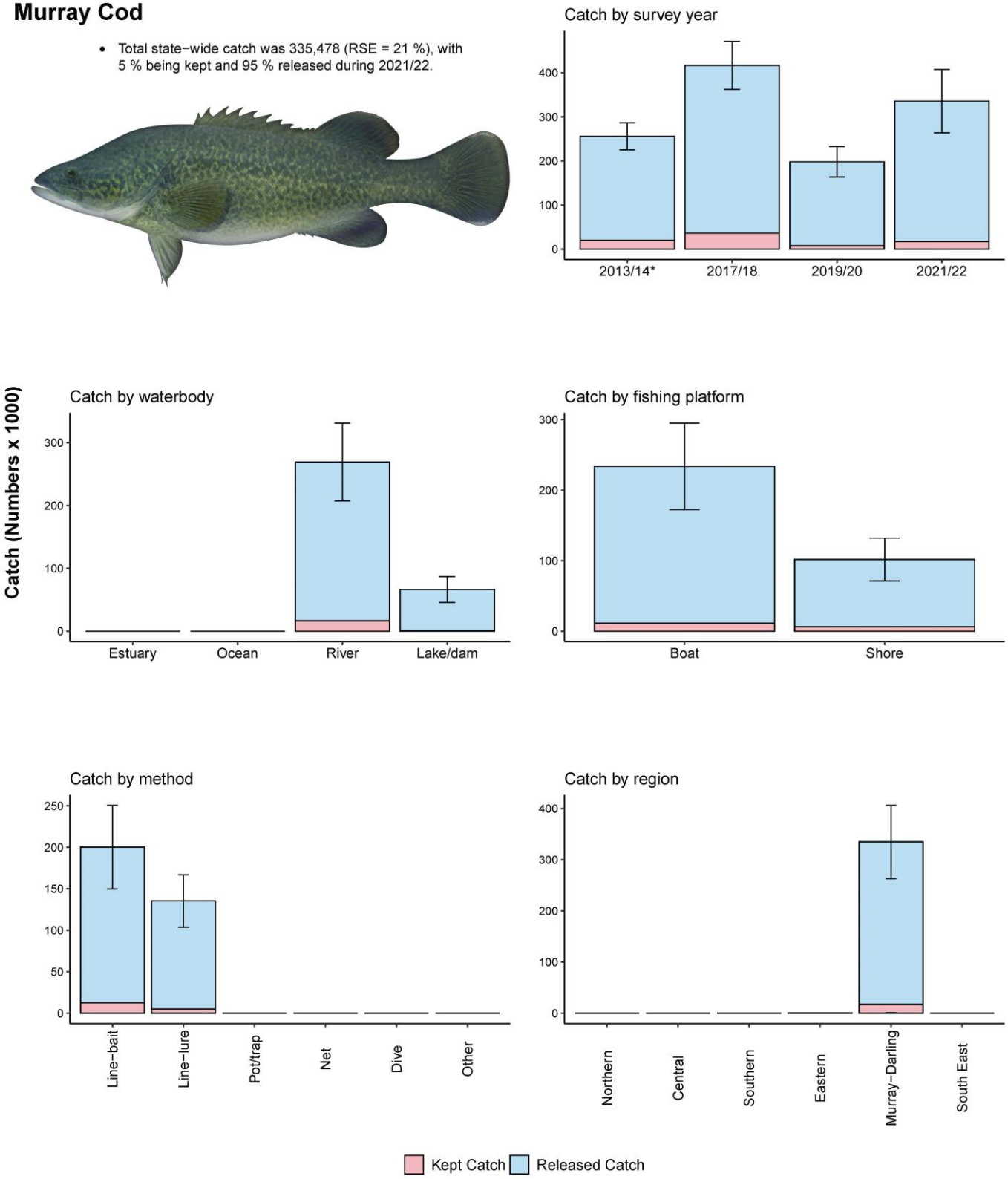
- Total state–wide catch was 71,277 (RSE = 35 %), with 18 % being kept and 82 % released during 2021/22.



Murray Cod (*Maccullochella peelii*)

Murray Cod

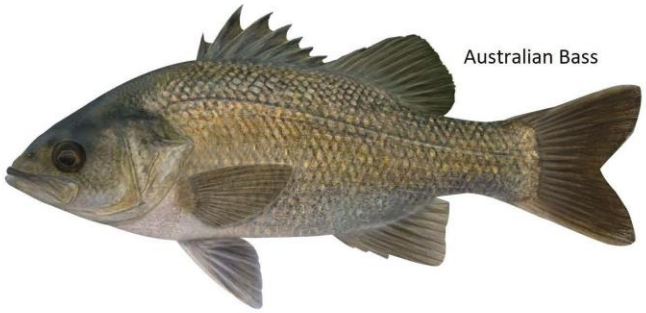
- Total state–wide catch was 335,478 (RSE = 21 %), with 5 % being kept and 95 % released during 2021/22.

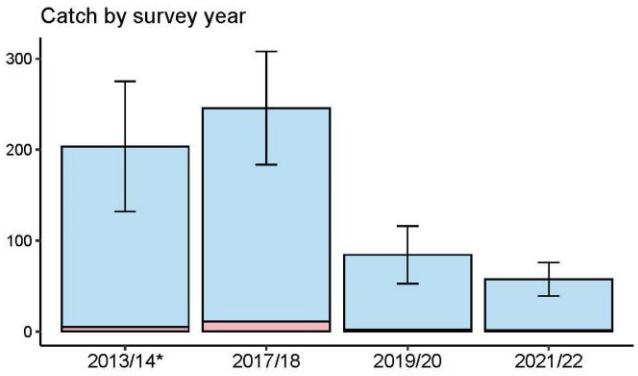


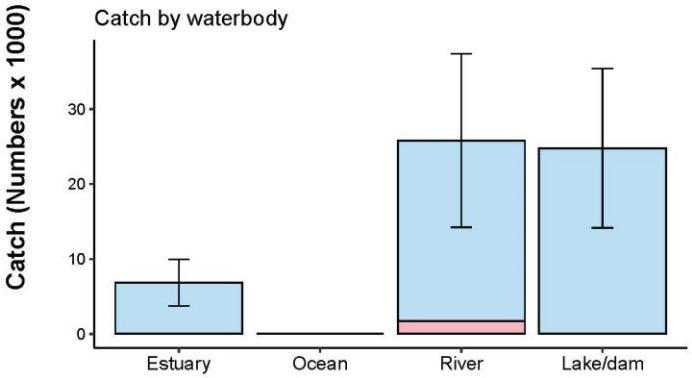
Australian Bass - species complex

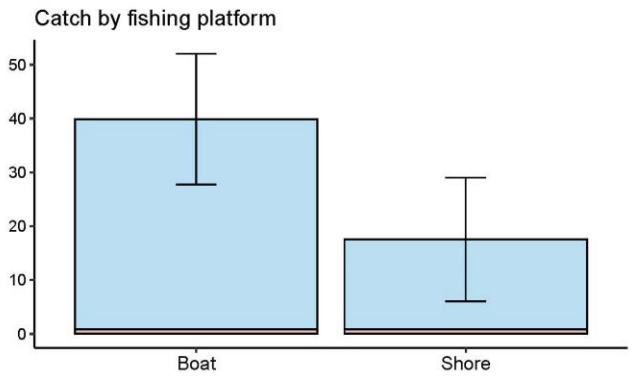
Australian Bass

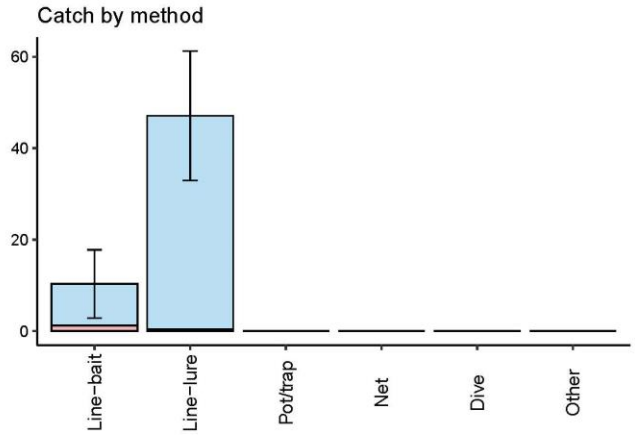
- 'Australian Bass' is a complex of two species, Australian Bass and Estuary Perch; with the former dominating the state-wide catch for this group.
- Total state-wide catch was 57,407 (RSE = 32 %), with 3 % being kept and 97 % released during 2021/22.

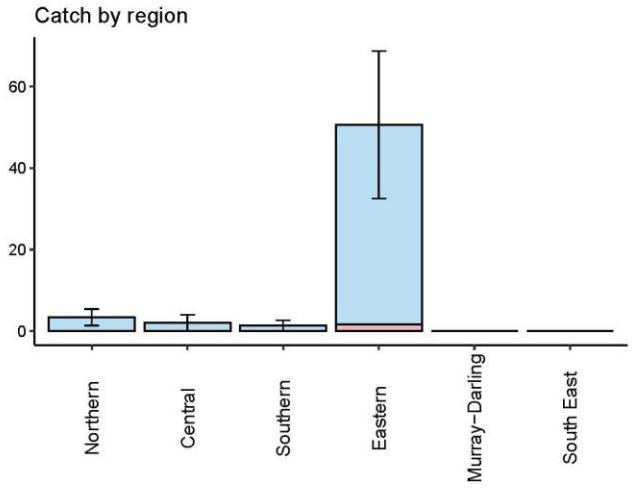








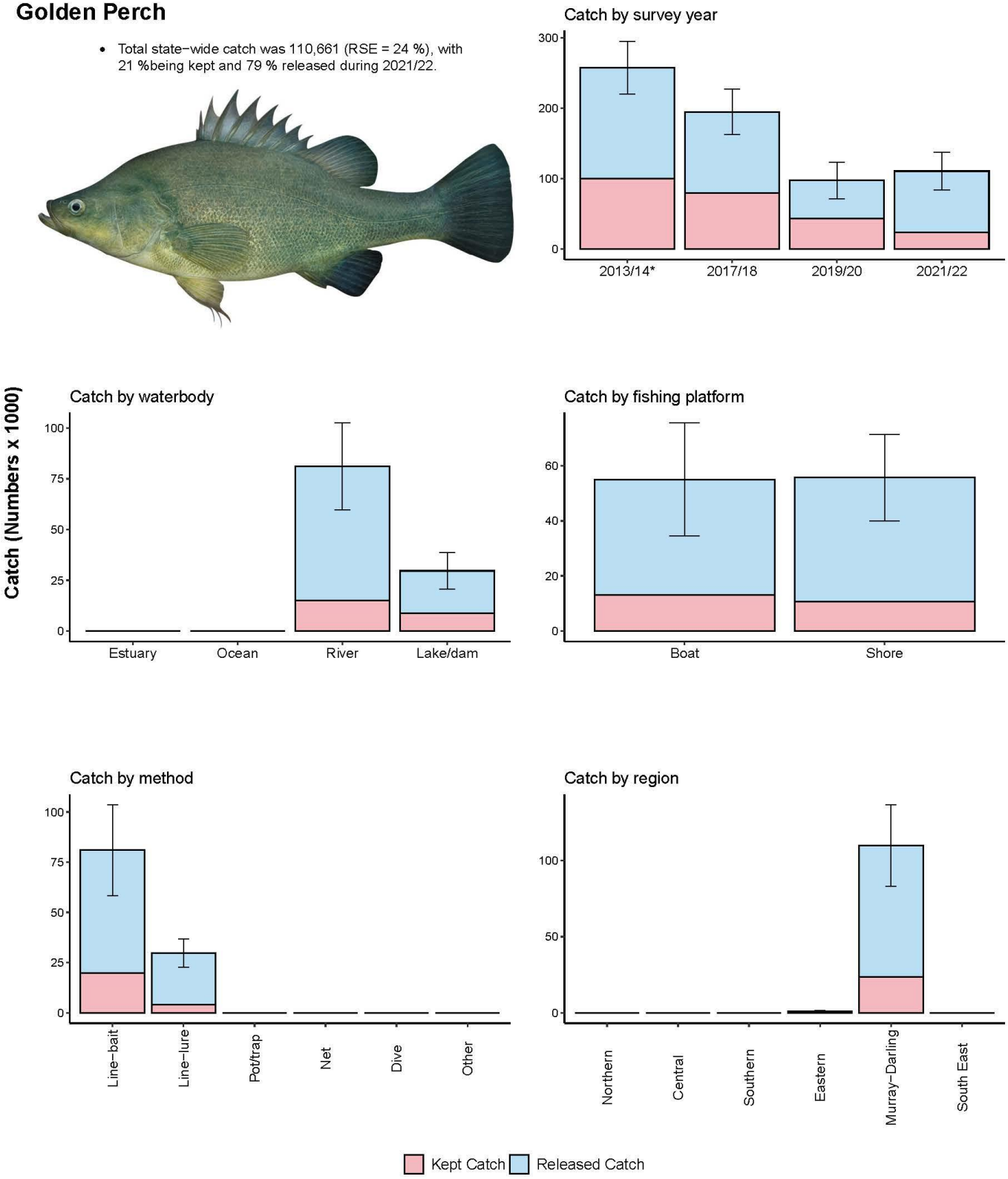




Golden Perch (*Macquaria ambigua*)

Golden Perch

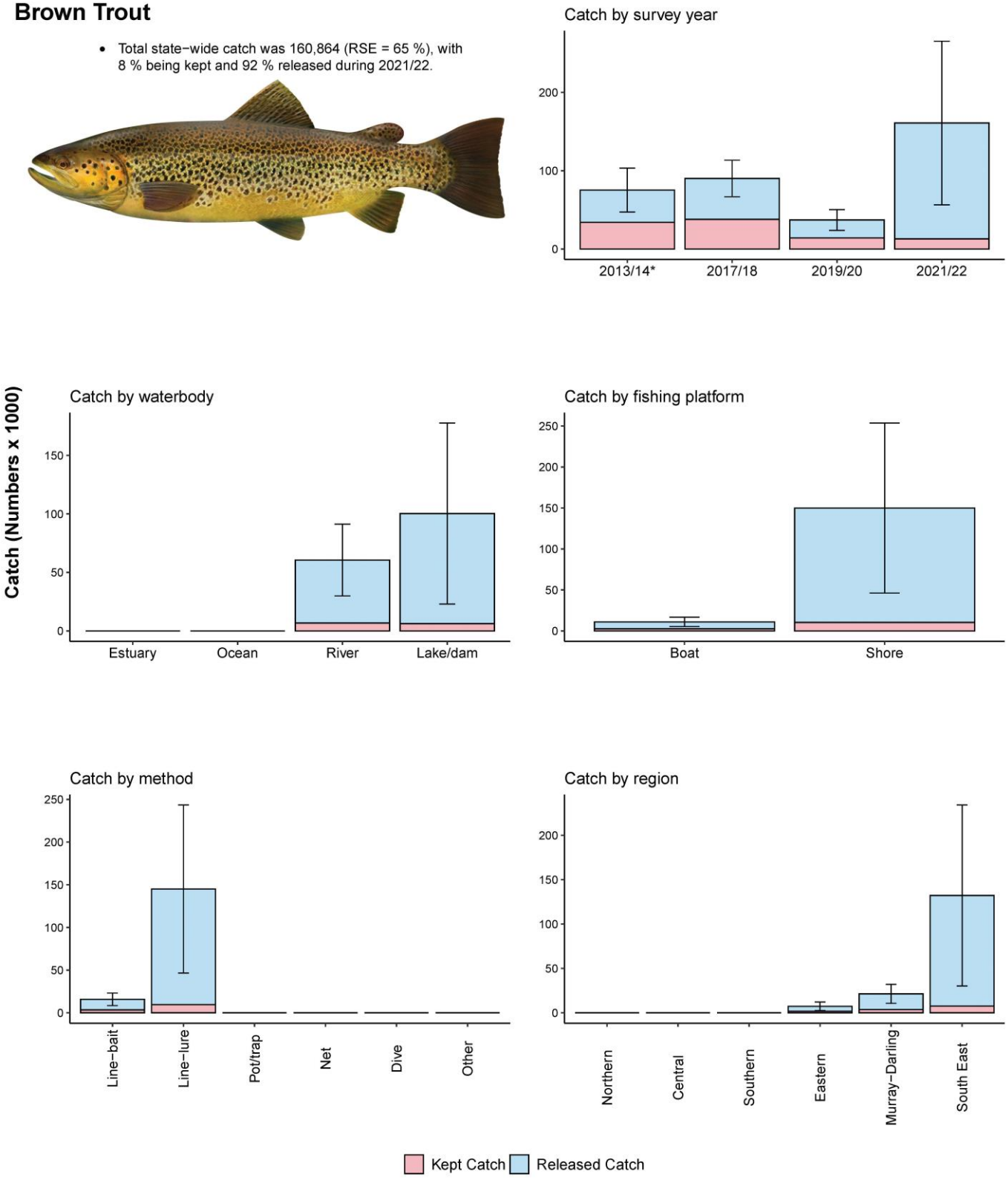
- Total state–wide catch was 110,661 (RSE = 24 %), with 21 %being kept and 79 % released during 2021/22.



Brown Trout (*Salmo trutta*)

Brown Trout

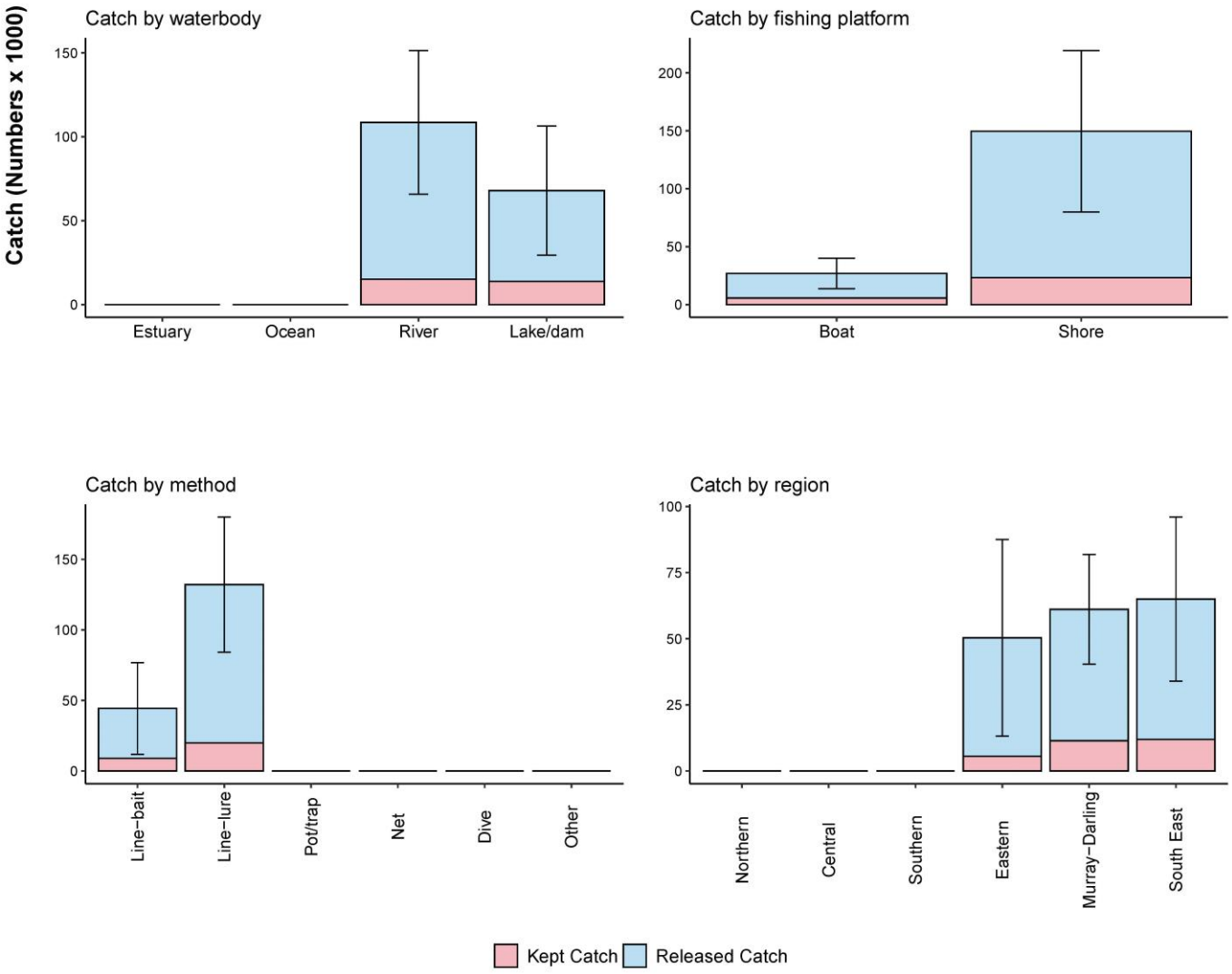
- Total state–wide catch was 160,864 (RSE = 65 %), with 8 % being kept and 92 % released during 2021/22.



Rainbow Trout (*Oncorhynchus mykiss*)

Rainbow Trout

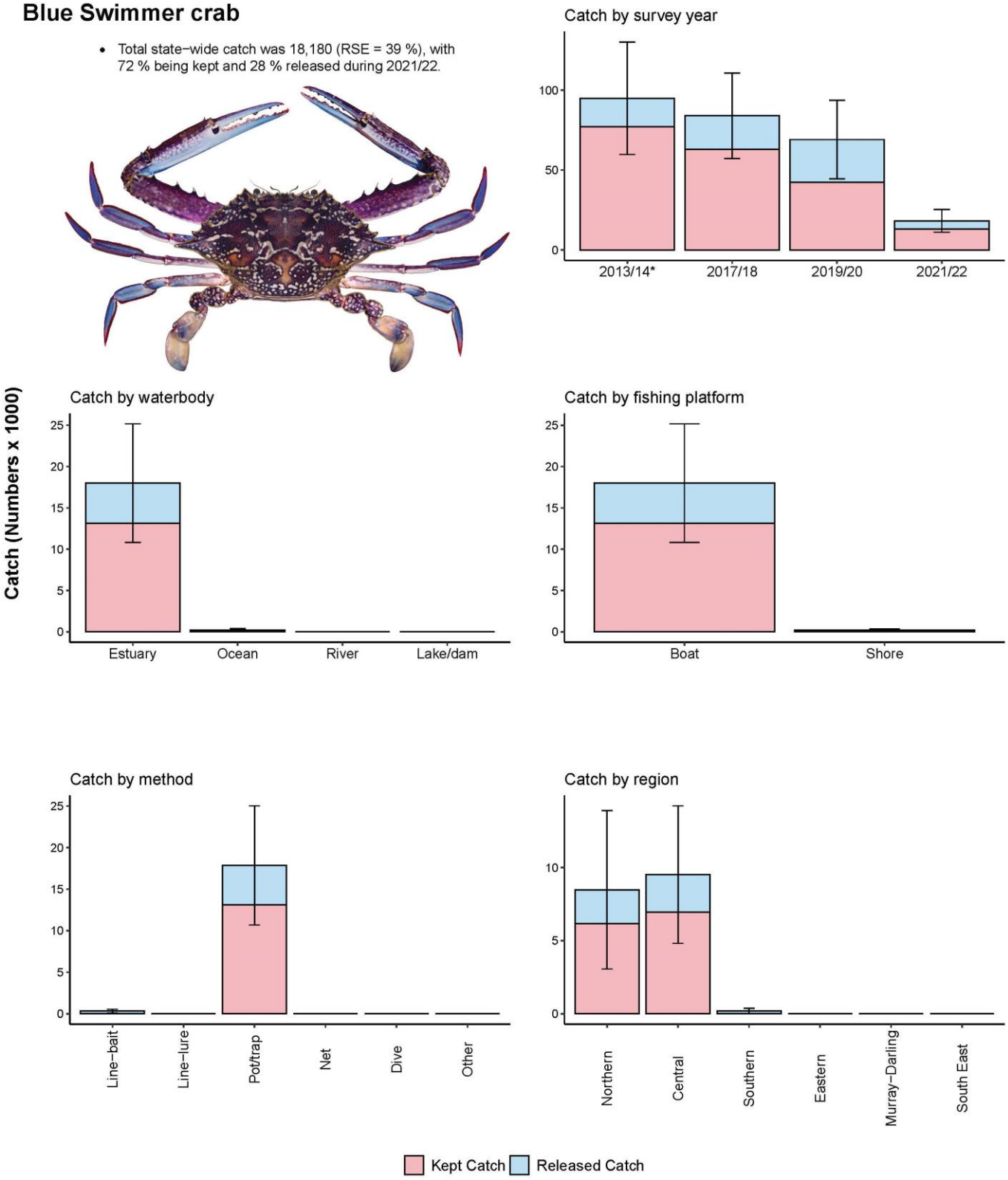
- Total state–wide catch was 176,437 (RSE = 44 %), with 16 % being kept and 84 % released during 2021/22.



Blue Swimmer Crab (*Portunus armatus*)

Blue Swimmer crab

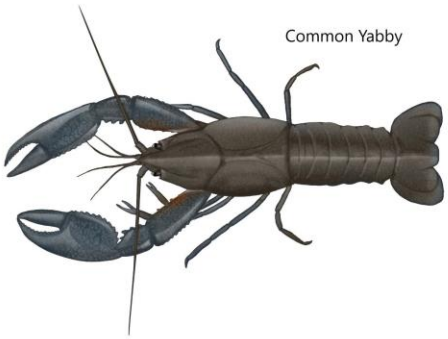
- Total state–wide catch was 18,180 (RSE = 39 %), with 72 % being kept and 28 % released during 2021/22.

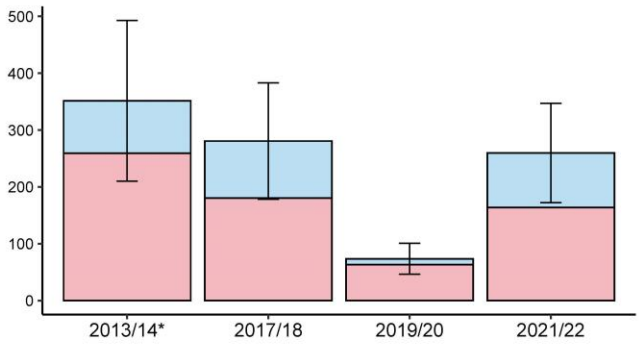


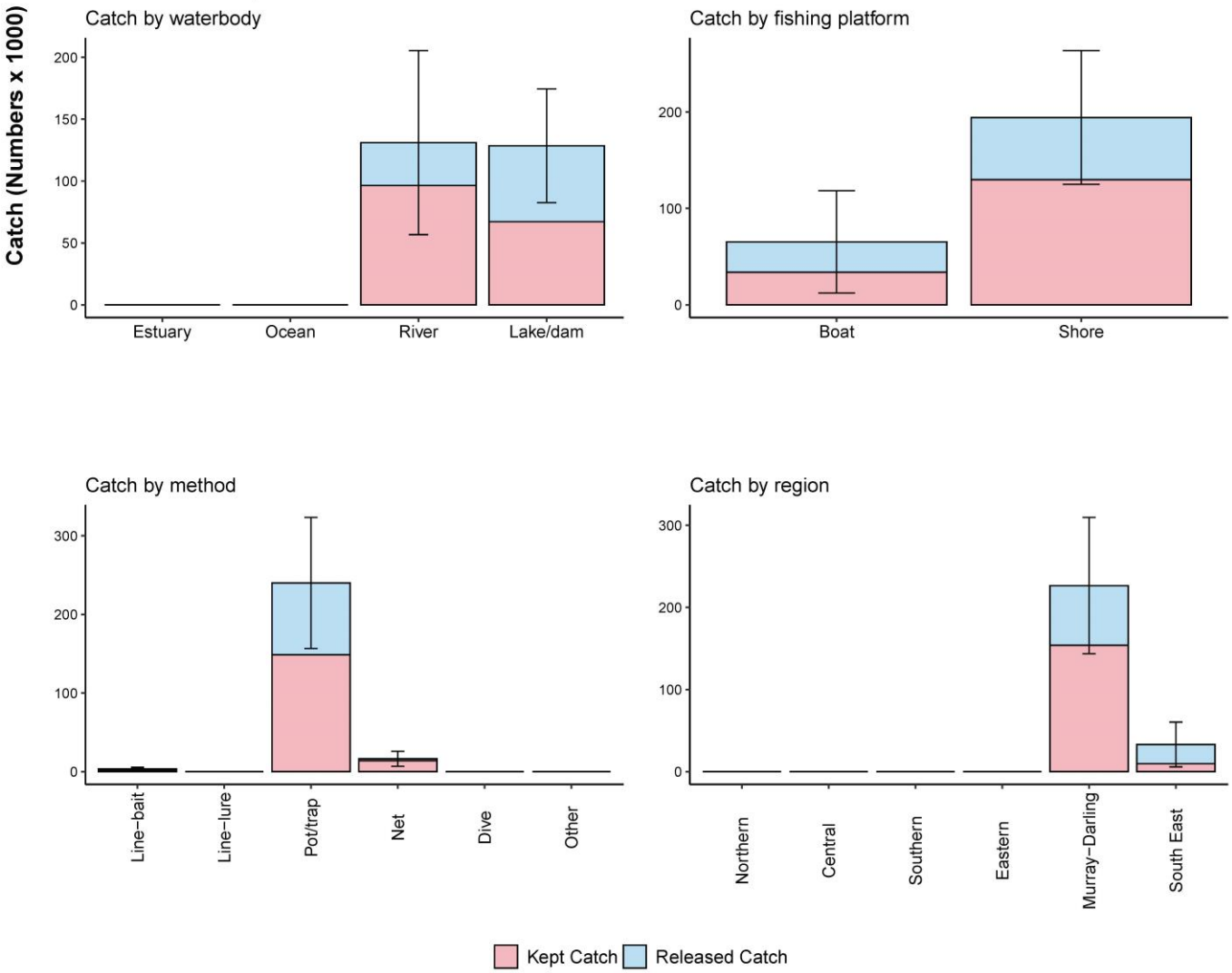
Yabbies - species complex

Yabbies (freshwater)

- 'Yabbies (freshwater)' is a species complex of several Parastacidae species; with the Common Yabby dominating the state–wide catch for this group.
- Total state–wide catch was 259,616 (RSE = 34 %), with 63 % being kept and 37 % released during 2021/22.







Discussion

The previous TD survey of 2019/20 was conducted during a very challenging period, with extreme environmental and social events impacting people's movements and ability to go recreational fishing (Murphy et al. 2022). During this survey period, NSW experienced some of the worst drought conditions on record, as well as an extreme bushfire season that affected much of the state. The COVID-19 pandemic was at its peak during this time with severe restrictions on movement throughout NSW.

The 2021/22 survey period was similarly impacted by severe, record-breaking environmental conditions, though in complete contrast to the drought- and fire-affected survey of 2019/20 (Bureau of Meteorology, 2020). In many parts of NSW, 2019 was the driest year on record by a substantial margin, and in contrast 2021 was one of the wettest.

COVID-19 also continued to be a disruptive presence during the 2021/22 survey year.

Environmental Conditions – 2021/22

The climatic conditions along the east coast of Australia during the 2021/22 period were marked by several significant weather events, with high levels of rainfall and extensive flooding. The extremely wet conditions were associated with a developing La Niña in the Pacific Ocean and a positive phase of the Southern Annular Mode which also contributed to the high rainfall (Bureau of Meteorology, 2022b).

The rainfall that persisted throughout eastern Australia during 2021 resulted in high soil moisture and high levels in major water storages well before the start of November. The 2021/22 TD survey began in November 2021 and this month was the wettest November for NSW since records began in 1900 (Bureau of Meteorology 2022a).

This event was followed by major flooding along the east coast and inland areas during early 2022, particularly for northern NSW. In March 2022, rivers in north-east NSW reached record levels, causing devastating flooding through the Tweed River, Wilsons/Richmond River, Clarence River and many other smaller estuaries on the Far North Coast.

The weather system that fuelled these floods subsequently moved southwards affecting several other coastal rivers and estuaries; the Hawkesbury-Nepean River catchment recorded its wettest multi-day periods on record with major flooding recorded at locations along the Nepean and Hawkesbury Rivers. Major flooding was also recorded in the Hunter Valley.

Heavy rainfall also continued over catchments west of the Great Dividing Range with high water levels eventually spreading throughout the Murray-Darling Basin (MDB), further boosted by severe wet weather events across NSW from late June. Prolonged, widespread flooding was experienced throughout the MDB in the latter part of 2022 (Bureau of Meteorology, 2022b).

COVID-19

In January 2022, COVID-19 restrictions were reintroduced in NSW as the Omicron variant coincided with a significant increase in cases across the state, rising to a peak in early January 2022. Vaccine boosters were offered state-wide and in February 2022 restrictions were partially eased. In April 2022 restrictions were further eased, although the wearing of masks in designated areas remained

in place for some time. During the remainder of 2022, restrictions were removed in line with health advice (Mental Health Commission of NSW, 2023). Despite the lifting of restrictions, a return to 'normal' pre-pandemic behaviours was not observed with reduced travel, modified work patterns and increased caution in social environments, more prevalent than prior to the pandemic (Beck and Hensher, 2022).

Fishing effort

The combination of extreme environmental conditions and the continued impact of COVID-19 during the 2021/22 survey is likely to have continued to suppress recreational fishing activity in much the same manner as drought, bushfires and COVID-19 did for the previous 2019/20 survey. These conditions may have contributed to the lower TD survey completion rate that was observed in 2021/22. While both the 2019/20 and 2021/22 surveys indicated similar levels of fishing participation and effort, this was lower than observed for the previous two surveys in 2013/14 and 2017/18. It is possible that a return to a more stable climate and pre-pandemic social conditions, may see fishing participation and effort revert to levels seen in these earlier surveys.

Catch

Declines in the catch of some species compared to that recorded in previous surveys may be a result of lower overall fishing effort with restricted access to fishing grounds due to flooding, storms, wet weather and high seas. During strong La Niña weather events such as experienced during 2021/22, more tropical cyclones and east coast low pressure systems can be expected, leading to storm surges, higher than normal significant wave heights and severe beach erosion along the NSW coast (Barnard et al., 2015). The catches of predominantly marine species such as Sand Flathead, Snapper, Grey Morwong and Yellowtail Kingfish declined markedly in comparison to the 2019/20 survey and this may partly be due to the abovementioned adverse environmental conditions.

Catches of some species remained relatively stable compared to previous years, for example, predominately estuarine species such as Bream, Dusky Flathead and Luderick. While being flood affected for extended periods, fishing is still possible in sections of estuaries where saline concentrations remain high and many fishing locations are protected from high winds and waves.

Other saltwater species may react positively to high freshwater inflows by triggering successful recruitment of juveniles, causing aggregations to occur in more downstream parts of estuaries, sometimes coincidental with high concentrations of prey. For example, in the 2021/22 survey the total catch of Mulloway increased by more than 4.5 times compared to the previous 2019/20 survey. This was primarily driven by a dramatic increase in the number of released individuals in 2021-22, with corresponding release rates increasing from 50 – 59% for previous surveys to ~82% in 2021-22 (West et al., 2015, Murphy et al., 2020, Murphy et al., 2022). Previous surveys have indicated that most recreationally caught Mulloway are released because they are smaller than the Minimum Legal Length and are therefore juveniles. It is therefore likely that the increase in released catch for Mulloway estimated in 2021-22 represents direct evidence for increased abundances of juvenile individuals in NSW during this period. The wetter than average period leading up to and during the 2021/22 survey period also aligns with predictions of the influence of favourable environmental condition on successful Mulloway recruitment (Stewart et al. 2020). The increase in the recreational catch of juvenile Mulloway during this period was also consistent with anecdotal reports from both

the commercial and recreational fishery of high juvenile Mulloway abundance in many NSW estuaries.

The catches of some freshwater finfish species in the MDB (e.g., Murray Cod, Redfin Perch) were higher in 2021/22 compared to previous surveys, possibly also the result of a positive response to favourable environmental conditions, notably improved river flows (e.g., Koehn et al., 2014; Stocks et al., 2021). Following high flow events, native species like Murray Cod and Golden Perch tend to respond positively, with improved growth resulting from increased food availability, increased movement, and strong recruitment events (King et al., 2009; Koster et al., 2014; Stocks et al., 2021). These responses are likely to enhance recreational fishing opportunities for such species. The increased catch of introduced Redfin Perch also aligns with anecdotal reports from anglers, reporting high catches of this species at various locations across NSW (e.g., Burrendong Dam, Hume Dam and Cox's River) during the survey period. Redfin populations are known for their boom-and-bust cycles, exhibiting similar catch variations across fisheries for the species elsewhere (e.g., Sabetian et al., 2015; Gwinn and Ingram, 2018).

In the impoundments of the South East (Snowy Mountains) Region, both Brown and Rainbow trout displayed marked increases in catch for the 2021/22 Survey compared to previous survey years. The increase in trout catch numbers is probably related to improved conditions including increased river flows, cooler water temperatures and increased food availability (e.g., Swales, 2006; Lobón-Cerviá, 2009). Anecdotal feedback from recreational fishers reinforces the observed increase in NSW salmonid fisheries, with many highlighting a substantial improvement in the fishery's overall performance.

Licence Sales

A decline in overall licence sales was most noticeable amongst the short-term licence categories (3 day and 1 month duration) which may also reflect the adverse environmental conditions experienced during the 2021/22 survey period, as well as restriction of movement across borders associated with COVID-19 travel restrictions. Short-term licences are usually purchased close to the time a person is likely to go fishing, for example, people may decide to purchase a short-term licence either prior to, or during a holiday break. The extremely wet conditions and COVID-19 impacts reduced the likelihood of fishers either going on holiday, or spontaneously deciding to fishing. In contrast, long-term licence (1 year and 3 years duration) sales remained relatively stable between surveys, perhaps reflecting a temporally consistent high commitment to fishing by a more avid population of recreational fishers represented by this group.

Summary

Interpretation of results from the 2021/22 TD Survey should be considered within the context of the likely impacts of the environmental and social events as outlined above, especially when comparing results to those from previous survey periods. Despite these impacts, the number of RFL households who completed the 12-month survey remained high, with ~88% of those who began the survey providing information on their recreational fishing activities throughout the year, even when going fishing in NSW was difficult or impossible. The major environmental and social impacts arising from the events outlined above highlights the importance of a consistent, on-going time-series of recreational fishing surveys, such as those undertaken within the RFMP.

The data collected provides a robust insight into the impacts of such events on one of NSW's most important recreational activities. The time-series collected by the RFMP will aid government and industry in understanding the potential consequences of such events, and managing their impacts, into the future.

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Appendices

The appendices listed below can be found by clicking the following weblink:

RFMP Survey 2021/22 Appendices.pdf

Appendix 1. Annual recreational participation (numbers of persons*) by Waterbody, Platform, Method and Region for RFL households who fished in NSW waters during 2021/22.

Appendix 2. Annual recreational fishing effort (numbers of fisher-days*) by Waterbody, Waterbody and Platform, Method and Region for RFL households who fished in NSW waters during 2021/22.

Appendix 3. Annual recreational catch (total, kept and released numbers) for 20 key species/groups caught by RFL households in NSW waters for 4 survey years, 2013/14, 2017/18, 2019/20 and 2021/22.

Appendix 4. Annual state-wide recreational catch (total, kept and released numbers) for all species/groups caught by RFL households in NSW waters during 2021/22.

Appendix 5. Annual recreational catch (total, kept and released numbers) for 20 key species caught by RFL households in NSW waters during 2021/22 by Waterbody.

Appendix 6. Annual recreational catch (total, kept and released numbers) for 20 key species caught by RFL households in NSW waters during 2021/22 by Platform.

Appendix 7. Annual recreational catch (total, kept and released numbers) for 20 key species caught by RFL households in NSW waters during 2021/22 by Method.

Appendix 8. Annual recreational catch (total, kept and released numbers) for 20 key species caught by RFL households in NSW waters during 2021/22 by Region.

Appendix 9. The total released numbers for 20 key species caught by RFL households in NSW waters during 2021/22 and the reasons for release.