

Statewide recreational fishing survey 2019-20

Methodological Report

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Social
Research
Centre

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1. Introduction

1.1. About this report

This report explains the data collection and methodology of the Statewide Recreational Fishing Survey (SRFS). The survey was conducted by the Social Research Centre on behalf of the Department of Agriculture and Fisheries (DAF). This report aims to provide a detailed record of the survey procedures for the diary as well as a summary of each stage of the SRFS 2019/20.

The purpose of this report is to:

- consolidate and summarise key project information
- provide a detailed record and analysis of the survey approach and procedures
- provide analysis relating to sample characteristics and final survey outcomes
- provide technical details regarding the statistical weighting methods applied to produce the final diary data and fishing estimates
- consolidate issues for consideration relating to the improvement of the diary design and refinement of the methodology for future surveys.

1.2. Project background

The key objectives of the survey are to provide reliable and defensible statewide estimates relative to Queensland resident recreational fishers who are 5 years or older. These estimates include:

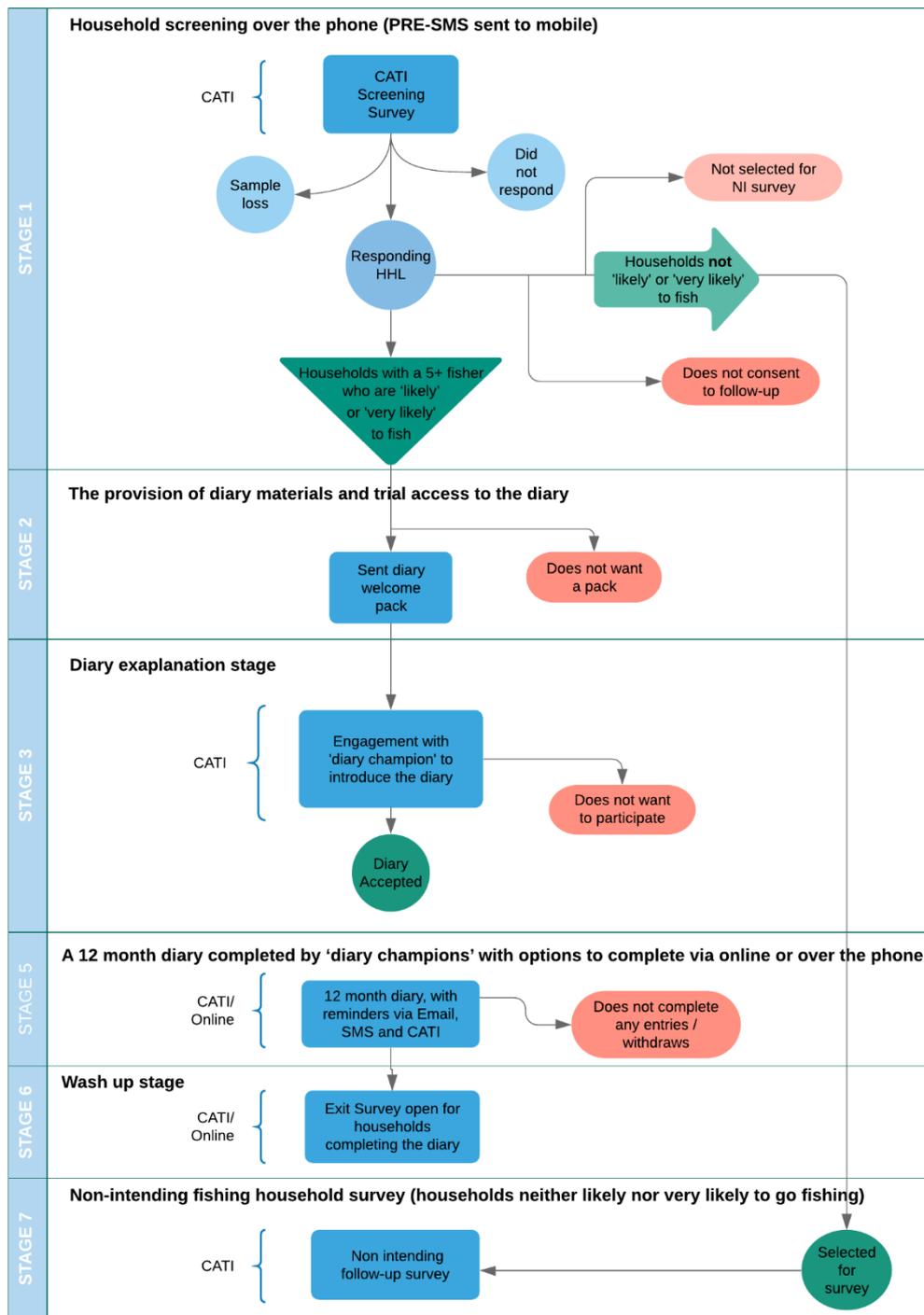
- The number of Queensland residents who fish recreationally and the participation rate of recreational fishing among Queensland residents by residential region, age and gender.
- Recreational fishing effort (days/events/hours) by Queensland residents by fishing method, time and place.
- Recreational fishing catch (harvest and release separately) by Queensland residents by species, method, time and place.
- The ability to calculate recreational fishing catch per unit effort (CPUE) by Queensland residents per fishing day, trip and hour by species, method, time and place.
- Expenditure on recreational fishing, for example, bait, tackle, fuel, equipment, accommodation.
- Recreational fishers' attitudes and awareness of various fishing and environmental topics.

Previous surveys were conducted in 2010/11 and 2013/14 and relied on telephone diary methods.

1.3. Project overview

An overview of the 2019/20 study can be found in Figure 1 below.

Figure 1 Project overview



1.3.1. Screening survey

The Screening Survey forms phase one of the SRFS 2019/20 and was conducted from 29 January to 10 April 2019. The Screening Survey was conducted via Computer Assisted Telephone Interviewing (CATI) with residents of Queensland. Households were asked whether they fished in the previous 12 months and whether they intended to fish over the next 12 months.

The total achieved sample size for the Screening Survey was 9,257 households. The response rate, that is interviews as a proportion of households contacted and not a screen out or other contact, was 40.5 per cent. The diary recruitment rate, that is households agreeing to receive the diary welcome pack as a proportion of eligible households (intending to fish), was 77.3 per cent. Further details on screening survey procedures and sample utilisation can be found in the SRFS 2019-20 Screening Survey - Technical Report (June 2020).

1.3.2. Diary explanation

Households recruited for the diary received a follow-up call to confirm the household’s participation in the diary. The diary explanation stage ran from 8 April to 12 May 2019. During this call households were asked to nominate a “diary champion” who would be the person in the household responsible for logging the household’s diary entries. They were also asked to advise how often they thought the household would go fishing over the next 12 months. Of the 2,640 households recruited at the screening survey, 1,844 households agreed to continue, 505 did not refuse and contact before the diary was unsuccessful and a further 180 were otherwise engaged with the diary by either logging into their Fishing Portal early or answering the one question form which asked them to provide their expected fishing avidity. These 2,529 households (95.7 per cent of eligible households) were progressed into the diary stage.

1.3.3. Diary stage

The diary stage forms phase two of the SRFS 2019/20. Households recruited for the diary were asked to keep a 12-month diary of their fishing activity, which included logging when they had not been fishing. The reporting period for the diary was 29 April 2019 to 28 April 2020 and data collection ran from 29 April 2019 to 24 May 2020. Households were reminded to log their diary as part of a monthly reminder schedule. Diarists were contacted via email, SMS and telephone. Contact frequency was based on how often or when members of their household intended to go fishing. See section 3.2 for further discussion on reminder activity.

Table 1 provides an overview of diarist retention over the 12-month period. A total of 2,529 households comprising 7,677 people, started the diary stage. Of those, 74.7 per cent completed the diary stage. See section 6.1 for further details on final status, including reasons for opting out or being unable to continue with the diary.

Table 1 **Diary stage key statistics**

Key project statistics	
Eligible for the diary at screening	3,475
Diary stage started	2,529
Uptake rate among eligible (%)	72.7
Diary stage completed	1,890
Completion rate among uptake (%)	74.7

1.3.4. Exit survey

The wash-up stage (exit survey) contributes to phase three of the SRFS 2019/20. Upon completion of the final diary and confirming all fishing activity over the previous 12 months, an exit survey was conducted to collect household information on economics, awareness, attitudes and other data related

to recreational fishing in Queensland, not otherwise collected in the 12-month diary. All households that completed the diary stage were eligible to take part in the exit survey. Of the 1,890 eligible households, 72 per cent agreed to answer all questions in the exit survey.

Table 2 Exit survey key statistics

Key project statistics	
Eligible households	1,890
Reportable completes	1,358
<i>Fished in last 12 months (%)</i>	63.0
<i>Did not fish last 12 months (%)</i>	37.0
Completion rate (%)	71.9
Average interview length (mins)	14.9

1.3.5. Non-intending survey

The non-intending survey also forms phase three of the SRFS 2019/20, with this survey aiming to measure unexpected fishing activity. The survey was conducted from 29 April to 15 May 2020. Households that said they did not intend to fish at the screening survey stage and agreed to follow-up were re-contacted 12 months later to confirm any unexpected fishing. Table 3 summarises key statistics for the survey. Of the 5,334 eligible households, 2,299 were selected proportional to each of the sixteen regions, and the target of 1,500 interviews was achieved. The response rate, that is interviews as a proportion of all interviews and refusals, was 92.3 per cent.

Table 3 Non-intending survey key statistics

Key project statistics	Total	Landline	Mobile
Selected sample	2,299	841	1,458
Reportable completes	1,500	524	976
<i>Fished in last 12 months (%)</i>	8.2	5.9	9.4
<i>Did not fish last 12 months (%)</i>	91.8	94.1	90.6
Response rate (%)	92.3	90.2	93.4
Average interview length (mins)	2.6	2.7	2.5

1.4. Quality assurance

All data collection activities were undertaken in accordance with the Privacy Act (1988), the Australian Privacy Principles, the Australian Market and Social Research Society's Code of Professional Practice, the Market and Social Research Privacy Principles, and ISO 20252 standards.

2. Methodology

2.1. Screening survey sample design

The survey utilised a tri-frame sample design, which consisted of landline random digit dialling, mobile random digit dialling and a listed mobile frame. Replacing electronic white pages, as used in the 2013/14 survey, with this sample design provides greater coverage by including mobile-only households and unlisted landline households. Utilising a listed mobile frame also allows us to target the mobile-only population of specific geographical areas. The sample design, including the 70:30 split of mobile phones to landlines, attempts to minimise sampling error for a given budget while providing a high level of coverage.

The commercial sample provider supplied both the landline and mobile phone samples. Accounting for the lower levels of access to telephones in Queensland, the estimated coverage of the tri-frame design is 96 per cent of adults. Further information on the three frames and their estimated coverage are described in the SRFS 2019-20 Screening Survey - Technical Report (June 2020).

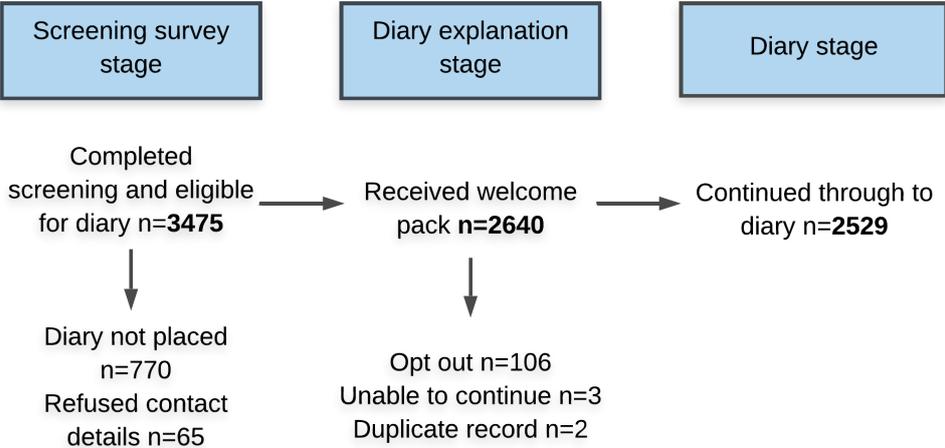
Upon completion of the screening survey, households that were likely or very likely to fish in the next 12 months were invited to participate in the diary stage.

2.2. Diary sample preparation and management

2.2.1. In-scope sample

The in-scope sample for the diary stage was all households likely or very likely to fish in the next 12 months and successfully recruited to the diary, excluding those that were a duplicate household (two mobile numbers recruited from the same household), unable to continue, or were an opt-out prior to the diary commencing. Contact with households ceased once a household advised they were unable to continue or were an opt-out during the diary stage. Figure 2 below steps out sample loss over the 15-month period from screening survey to diary stage.

Figure 2 Flowchart of sample loss



2.2.2. Sample preparation

Prior to the diary explanation stage, a welcome pack was mailed or emailed out to all households recruited to the diary during the screening survey. While every effort was made to collect accurate contact details, email addresses and mailing addresses were cleaned in accordance with the SRC's standard cleaning rules (e.g. correct minor errors in email address). Mailing addresses were processed through Australia Post's *Postman* service to provide a final mailing address that conformed to Australia Post's requirements and to append an Australia Post Delivery Point Identifier, or DPID (i.e. whether a mailing address is matched, or recognised, by Australia Post).

During the explanation stage, households were split into two groups, those who were able to complete the 12-month diary online and those that wanted to complete the diary over the phone. A 'diary champion' was established, becoming the main point of contact for the household. Other key sample information collected to inform diary user experience and contact with the household was: number of people in the household; name/initial; age and gender of each household member; expected frequency of fishing; and, preferred time and method of contact.

2.2.3. Sample management

A master database was established to facilitate operational procedures associated with the conduct of the diary. The master database also enabled the generation of status reports and lists for reminder and targeted follow-up activities over the 12-month period. The key processes managed by the master database included contact list generation, diary entry tracking, status reporting, and helpdesk operation.

In addition to contact details, the information updated on an ongoing basis included date of next expected fishing, household notes (for example, best times to call, usual fishing spot if applicable), outcome of previous call, and previous interviewer spoken to. Records were also flagged with contact detail issues such as bounced email or return to sender address for the interviewing team to update the relevant contact information as applicable.

3. Response maximisation

3.1. Welcome pack

A welcome pack was sent to all eligible households after the screening survey to introduce them to and engage them with the diary. The pack contained: an approach letter from the Department of Agriculture and Fisheries, a fishing portal access card with unique login details, a diary card with a table structured to demonstrate the information collected in the diary (see Appendix 1), and a fish identification guide supplied by the Department. The approach letter introduced the diary stage, provided information on how to log fishing activity and where to find further information, explained prize draw details, listed frequently asked questions, and stepped out the overall timeline of the project. As part of the data collection procedures adopted for the survey, arrangements were put in place to send additional materials to households who either failed to receive the original pack or requested extra materials during fieldwork.

3.2. Diary contact strategy

At the explanation stage of the project, respondents were asked how often or when they were likely to go fishing over the 12-month diary period. A contact schedule was produced based on this expected fishing avidity. Unless a household filled in their diary when they were expected to, the contact schedule was broadly as follows:

- Weekly or monthly fishers – contacted monthly
- Expected to go fishing 6 to 11 times – contacted every second month
- Expected to go fishing 4 to 5 times (or avidity unknown) – contacted every third month
- Expected to go fishing 2 to 3 times – contacted every four months
- Expected to go fishing once – contacted every 6 months

The monthly contact schedule was then in operation as follows:

Week 1 – Online respondents that were likely to fish in the previous month but had not entered any fishing activity (i.e. a fishing or no fishing entry) for that month were sent an email reminder.

Week 2 – Online respondents that were likely to fish the previous month but had still not logged a diary entry that month were sent an SMS reminder with the option to reply if they hadn't been fishing or use the link to access their online diary. Offline respondents that were likely to fish in the current month were added to that month's contact schedule and called for the remainder of the month until contact was made. This also allowed time to make appointments to log any more fishing taking place throughout the month.

Week 3 – Online respondents included in communications in weeks one and two that still had not yet responded were added to the month's CATI contact schedule.

Week 4 – Continued to dial both online and offline diarists who had yet to respond for the month.

It was recognised that a household's expected fishing avidity would likely change over time and the contact schedule was amended to reflect the household's circumstances. Changes to a household's circumstances included:

- the household notifying when they would next go fishing if their next contact was too soon or not soon enough,

- advising that they likely wouldn't go fishing for the remainder of the diary and agreeing to a call-back in the final month,
- requesting only a certain mode of contact, or
- requesting we hold off our contact with the household for a particular time period.

Households that were contacted in a given month and did not respond were carried over to the next month's contact schedule. This continued until the household responded and they were returned to their regular schedule, unless otherwise requested.

Tailoring the contact schedule to each household's circumstance aimed to strike a balance between ensuring reminders were frequent enough to make sure that no fishing activity was missed, and not overburdening occasional fishers with too many reminders.

3.2.1. Email and SMS reminders

Based on the reminder schedule mentioned above, the Social Research Centre sent email and SMS reminders at the start of every month. All emails featured 'single-click' access to start the diary and a single-click option to indicate that they had not fished since the last diary entry. To keep diarists engaged, the theme of each email changed throughout the diary period. Some themes utilised included a reminder of prize draw eligibility, photos of fish species of interest caught by diarists, and advice on what to do to help identify types of species caught. In keeping with the strategy to provide a range of themes across the emails sent, the subject line was altered each month with different messaging, such as,

- "Please log your fishing diary to be eligible for the prize draws"
- "Gone fishing this summer? Please update your QLD Fishing Diary"
- "More than 2000 events reported so far for the Fishing Diary. Your fishing is important! Please let us know to be in the draw".

As part of measures to ensure that all fishing, particularly more recent activity, was accounted for in the diary, all households with an email address were sent email reminders in the final two months. The final email reminders included a summary of the household's fishing over the 12-month period as a prompt to make sure that all fishing activity had been logged in the diary. Households received up to four emails in the final diary collection effort.

The SMS reminders served as another prompt for online diarists to log diary activity. The SMS reminders had similar functionality to the email reminders, albeit in an abridged form due to the limitations on the length of SMS messages. All SMS reminders included a 'single-click' link to the diary and the option to simply reply to the SMS if they had no fishing activity to log. Towards the end of the final month, an SMS reminder was also sent to any remaining households in the call cycle, reminding them of which number we were calling from, why they were being called and the importance of completing their final diary entry.

3.2.2. Call procedures

Call procedures to maximise response included:

- leaving notes on the record to assist with building rapport with the household
- offering to tailor frequency / type of communications
- use of the same outgoing number with a Queensland prefix from the screening survey

- leaving voicemails on the first call of the month and when an appointment was missed
- providing ongoing training to interviewers on logging a diary entry
- providing interviewers with a searchable, customised google map, overlaid with the diary's fishing location grid
- offering a Department contact to help identify unknown species
- providing extra diary materials on request.

3.2.3. Other response maximisation

The **Fishing Portal** was set up to ensure all information required for the diary was provided in the one location. This included a link to the diary, information on past diary entries, more information about the survey including a link to the Department's website, links to the fish identification guide and fishing region maps, privacy policies and prize draw details.

Extra communications were sent out to all diarists to maintain engagement with the diary. A newsletter was sent seven months into the diary stage and was sent both by post and electronically. This included tailored messaging for non-responding households, a featured story and catch photo from one of the diarists, a summary of state-level information collected in the diary to date, a feature on the monthly prize draw, a message from the interviewing team, and a message from the Minister. Another project update email was sent later in field with similar messaging.

Refusal aversion tactics were discussed with interviewers ongoing. Reasons for opting out of the diary are listed in section 6.1. The main reasons were lack of fishing and no longer interested in participating. Encouraging households that were no longer fishing to continue with the diary was a main point of refusal aversion focus. Interviewers reiterated the importance of collecting data from all households in the diary, even if their circumstances had changed and they no longer planned to go fishing. Interviewers also offered a call back at the end of the diary stage to confirm no-one in the household had gone fishing, in order to keep them in the diary stage.

Targeted phone calls from a different outgoing number were made half-way through the diary to non-responding households. Upon a no answer or voice message left, the interviewer emailed the diary champion to let them know why we were calling. A change of outgoing phone number was also introduced in the final days of the diary and this saw an improvement in overall response by two percentage points.

3.3. Interviewing team

A total of 19 interviewers were briefed on the project, which was made up of 12 in the original team and another 7 interviewers brought on to cover the wash-up stage. Three interviewers completed half of all complete, partial and no fishing diary entries logged over the phone. Prior to the wash-up stage, two thirds of those that logged an entry eight or more times spoke to 5 or 6 different interviewers over the 12-month period.

3.4. Helpdesk

The Helpdesk telephone number and email address were included on all related survey communications to allow diarists the opportunity to seek clarification or ask for assistance regarding the diary. Requesting an appointment (35.5 per cent), updating contact details (20.1 per cent) and opting out of the diary (19.3 per cent) were the most common reasons for contacting the helpdesk. Of

the 2,640 households recruited to the diary at the screening survey stage, 199 households (7.5 per cent) contacted the Helpdesk and a total of 358 queries were made. General queries covered questions about the diary or project overall, while Survey assistance included diary entry amendments, problems with the online diary and requesting a link to the diary. Table 4 below outlines the Helpdesk outcomes for both phone and email contact.

Table 4 Helpdesk outcomes

Call outcome	N	%
Appointment request	127	35.5
Advised contact detail change	72	20.1
Opted out of the 12-month diary	69	19.3
General queries	29	8.1
Survey assistance	24	6.7
Logged no fishing	15	4.2
Unable to continue	11	3.1
Requested to be removed from reminders - Phone	4	1.1
Requested to be removed from reminders - SMS	3	0.8
Follow up query	3	0.8
Feedback	1	0.3
Grand Total	358	100.0

4. Diary Design

4.1. Fishing Portal

The Fishing Portal was set up as the first point of entry containing relevant information, diary materials and access to the diary. Once the fisher was in the diary, they were shown their past 5 diary entries to help with recall of what fishing activity had already been logged, and were asked the question: “Have you or anyone in your household been fishing since <date of last fishing activity>, even if you didn’t catch anything?”. If they had yet to complete their previous entry, it was at this point they were asked to finish this off before starting the next one.

4.2. Data collected in diary

The diary collected information about each household’s fishing activities, including:

- date/s of fishing trip
- location/s selected from map of the diary’s fishing regions
- platform fished from (private/hire boat, charter boat, ocean beach, ocean rocks, other shore)
- fishing method (line, pots/traps, cast net, other nets, spearfishing, pump/forks/spade, hand collecting or other)
- species caught
- number of fish or crabs caught, kept and released
- reasons for release; and
- the expenditure associated with each fishing trip.

See Appendix 2 for the questionnaire.

4.3. Diary questionnaire design

The design of the diary questionnaire was based on a ‘unified mode of questionnaire construction’¹ approach which aimed to minimise mode-related measurement error across the various modes of data collection (online-mobile, online-large screen devices and CATI). In practice, this involved producing a single questionnaire which was tailored to the mode of collection.

The ability to tailor data collection for each mode was facilitated by the use of the Unicom Intelligence software, which is a software platform that collects data in one centralised environment, allows for tailored survey presentation by mode, and facilitates ‘seamless switching’ between modes (e.g. a survey can commence online and be finished off by telephone, or vice versa). The collection of data in a centralised environment also provided diarists with real-time recent fishing event histories to aid the completion of the diary.

Quality Assurance testing included checking that all the questions in the survey were presented accurately and that the questions were presented as anticipated across all devices.

At the design stage, it was identified that it would be important to ensure that the survey presented well on mobile devices as the anticipated demand for completion on a mobile phone was expected to

¹ Lynn, Methodology of Longitudinal Surveys, 2009; p131

be high. Some of the device effects associated with taking online surveys via mobile devices² include longer questionnaire completion times, but quicker response times, higher break-off rates, shorter answers to open-ended questions, increased primacy effects and increased use of responses that appear on the screen without the need for vertical or horizontal scrolling. With these issues in mind, considerable effort was made to create an alternative mobile-friendly version of the diary questionnaire to mitigate some of the potential negative device effects.

The focus of optimising the diary questionnaire for mobiles appears to have been justified, with around half of all online fishing entries made on a mobile or tablet device during the diary stage.

4.4. Diary question sequence

Before entering data across the three modes, the diary was designed to identify if there was any fishing activity since the last contact, and if so, go on to record fishing activity.

To minimise mode effects, the question order sequence used was the same across all modes.

As has been the convention with other fishing diary projects, catch data is required for each 'split' event. A single fishing trip may be required to be separated into multiple 'split' events in situations where the fisher went fishing in multiple locations, used more than one method and so on. Where this separation occurs, it gives rise to a 'split event'.

There were four fishing trip questions in the diary that could give rise to a 'split event'. The questionnaire was designed to collect details about these potential splits in the order set out in Figure 3 below.

Once a split had been identified, for example if the diarist needed to record fishing at two locations, the diarist would be asked to provide the remaining trip details and catch for the first location, before returning to the second location to record the same information.

Figure 3 Split event design

Order	Questions where a split can occur	Splits for each unique event
↓	Location (multiple)	Split for each location
	Waterbody (6)	Split for each waterbody
	Method (2)	Split for spearfishing and everything else
	Platform (3)	Split for private boat, charter boat and all shore types
	Catch	Collect catch module for the split event then return to the most recent question where the split arose

² Callegaro, M., Manfreda, K. L., & Vehovar, V. (2015). Web survey methodology. Sage.

4.5. Testing and debriefing

Several changes were made to the questionnaire and approach to the diary throughout fieldwork based on debriefing sessions with interviewers and feedback from diarists. The main improvements included:

- Adding notes to provide further clarification on how to answer questions, such as, the date of fishing (how to log single day and multi day trips), waterbody (differentiating between fresh and saltwater bodies), and species caught (assistance on how to use the look up list).
- Providing further clarification on how to answer the expenditure question, increasing the range captured for some of the items, and providing a 'don't know' option for each line item to clearly differentiate between no expenditure and being unsure on how much was spent.
- Adding links to specific fish identification guides for species commonly referred to as their generic name (such as flathead, bream, whiting, grunter, parrot fish and tuskfish), to help with identifying the more exact type of species.
- Updating the species look-up list table linked to the diary, based on common species caught by the diarists or updates to CAAB codes.
- Adding extra open-ended boxes for species caught.

5. Data Collection & Quality Control

5.1. Operational testing

Comprehensive testing was carried out by the Social Research Centre project management team to ensure the survey instruments were working correctly. Testing procedures included:

- programming the skips and sequence instructions as per the diary design, and
- rigorous checking of the diary in 'practice mode', including checks of the multiple possible scenarios and split events, on-screen 'presentation' of questions and response frames.

5.2. Field team briefing

All interviewers selected to work on the survey attended a comprehensive briefing session covering the project background, objectives and procedures; all aspects of administering the survey questionnaire, including specific data quality issues; an overview of respondent liaison issues, including refusal avoidance techniques; and, practice interviewing.

The briefing sessions were delivered by the Social Research Centre project manager and supervisory staff. In total 19 interviewers were briefed to work on the survey. The initial briefing session was held on 29 April 2019. See Appendix 2 for a copy of the briefing session slides.

5.3. Fieldwork quality control procedures

The in-field quality monitoring techniques applied to the survey were consistent with existing ISO 20252 procedures, and included:

- monitoring (by remote listening) of each interviewer within their first three shifts, whereby the supervisor listened in to at least 75 per cent of the interview and provided comprehensive feedback on data quality issues and respondent liaison technique
- validation via remote monitoring covering the interviewer's approach, rapport and conduct of the call
- field team de-briefing after the first shift and, thereafter, whenever there was important information to impart to the field team in relation to data quality (for example, identifying species correctly), consistency of interview administration, techniques to avoid refusals, appointment-making and note-taking conventions, project performance, or other updates (for example, notifications on Queensland fishing regulations)
- maintenance of a 'question and answer' log, addressing issues raised by interviewers, to clarify survey administration and definitional issues in the questionnaire or procedures, and
- monitoring the interview to refusal ratio by interviewer including long term household engagement.

As per the ISO 20252 standard, 5 per cent of all telephone surveys completed must be validated. The minimum ISO requirements were met for this survey with 5.8 per cent of all diary entries completed over the phone being validated.

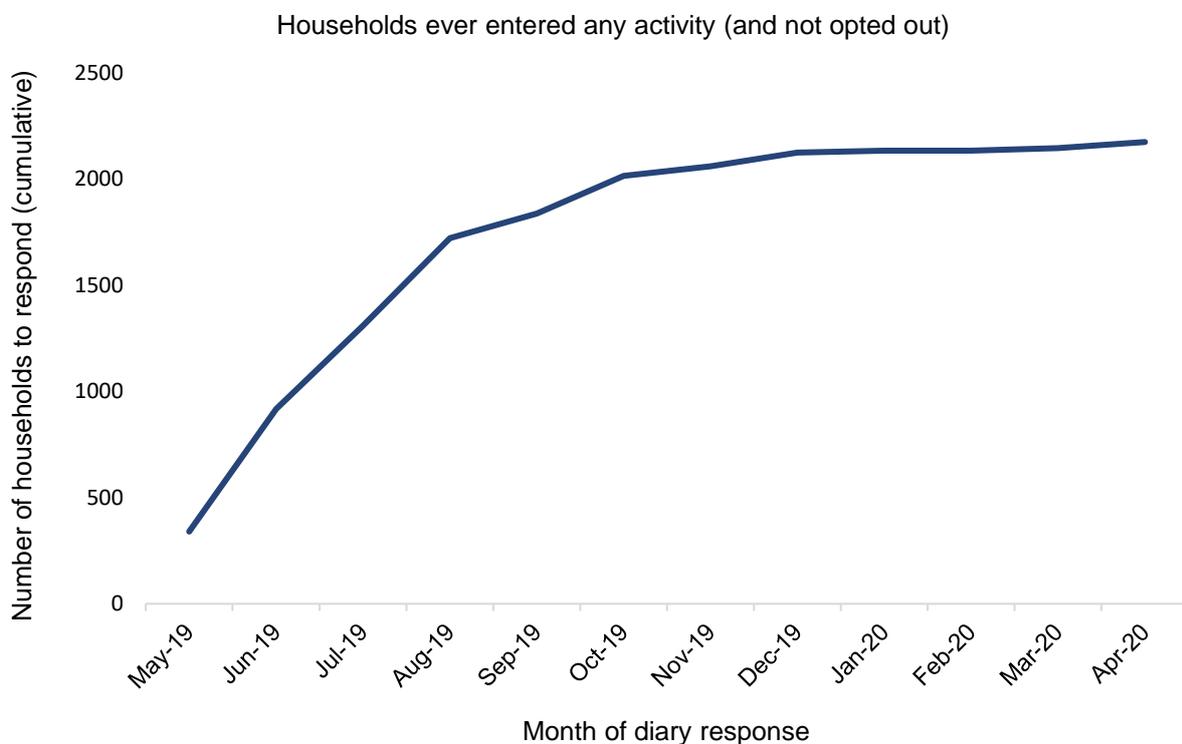
6. Response outcomes

6.1. Diary response

6.1.1. Retention by month

Of the 2,529 households starting the diary, there were 2,174 households (86 per cent) that entered at least one diary entry and did not opt out over the 12 months. Figure 4 below shows cumulative participation in the diary by month. June and August experienced the highest response in terms of new households participating, with another 577 and 412 respectively (45 per cent of all participating) completing their first no fishing or fishing entry throughout those months.

Figure 4 Retention by month



Base = 2,529 households starting the diary

6.1.2. Final sample utilisation

Of the households starting the diary, 75 per cent completed an entry in the final month. Of the 289 households still in the diary but only a partial complete, 66 completed an entry in the 50 days prior to wash-up stage and were therefore deemed reliable to use in the final data outputs. Households choosing to opt out of the diary made up 7 per cent, of which 43 per cent logged a diary entry and subsequently opted out.

Table 5 Final household outcomes

Final sample utilisation	n	%
Total	2,529	100
Complete	1,890	74.7
Partial complete	289	11.4
<i>Partial* & dropped off</i>	280	11.1
<i>Partial* & unable to continue</i>	9	0.4
Opted out [#]	171	6.8
<i>Partial* & opt-out</i>	74	2.9
<i>Did not complete & opt-out</i>	97	3.8
Did not complete	179	7.1
<i>Unable to continue</i>	22	0.9
<i>Never responded</i>	157	6.2

* partial complete refers to households completing at least 1 entry but not completing 12-month diary

The most common reasons for opting out of the diary were no longer being interested in participating (14 per cent) and no longer planning on going fishing (14 per cent), followed by opting out due to health issues (11 per cent) and no time for fishing or participating in the diary (10.5 per cent). The most common reason for not being able to continue with the diary was the household no longer being contactable on the contact details originally provided (61 per cent).

Table 6 Reasons for withdrawing from the diary

Opt-out	n	%
Total	171	100
No longer interested	24	14.0
No longer fishing	24	14.0
Health issues	19	11.1
No time for fishing or diary	18	10.5
Too many communications	15	8.8
Change of circumstances (environment / family / other personal)	14	8.2
Refused all communications	7	4.1
Miscommunication with original person spoken to	4	2.3
Not interested in rec fishing research	4	2.3
Unhappy with changes to legislation	3	1.8
Technical difficulties	2	1.2
Other / no reason given	37	21.6

Unable to continue	n	%
Total	31	100
No forwarding address / not known at address	19	61.3
Moved away from Queensland	5	16.1
Too old / frail / ill-health	4	12.9
Deceased	3	9.7

6.1.3. Diary participation

Uptake rate, that is the proportion of eligible households starting the diary, and completion rate, that is the proportion of diary started households completing the diary, is presented by region in Table 7. The overall uptake rate among eligible diarists was 73 per cent, which ranged from 69 per cent in the Gold Coast region and 80 per cent in the Darling Downs and Fitzroy Hinterland regions. The overall completion rate among households starting the diary was 75 per cent, which ranged from 69 per cent in the Central West / North West / South West region and 80 per cent in the Wide Bay-Burnett region.

Table 7 Diary conversion by region

Residential region	Eligible for diary	Accepted welcome pack	Diary stage started	Diary stage completed	Uptake rate % eligible	Completion rate % uptake
Total	3,475	2,640	2,529	1,890	72.8	74.7
Brisbane	1,045	765	729	551	69.8	75.6
Gold Coast	332	240	229	169	69.0	73.8
Sunshine Coast	232	169	163	123	70.3	75.5
West Moreton	153	125	121	88	79.1	72.7
Wide Bay-Burnett	219	166	162	129	74.0	79.6
Darling Downs	225	187	180	141	80.0	78.3
Central W / North W / South W	151	121	117	81	77.5	69.2
Gladstone	92	72	67	53	72.8	79.1
Rockhampton	179	135	127	93	70.9	73.2
Fitzroy Hinterland	65	54	52	37	80.0	71.2
Mackay Whitsunday	156	119	114	82	73.1	71.9
Mackay Hinterland	81	63	61	45	75.3	73.8
Townsville	166	122	119	83	71.7	69.7
Northern	63	52	48	36	76.2	75.0
Cairns	173	134	130	93	75.1	71.5
Far North Queensland	143	116	110	86	76.9	78.2

The demographic characteristics of the main diarist by their diary response is presented below in Table 8. The main diarist or 'diary champion' refers to the main point of contact throughout the diary period and, although they often were, this was not always the person in the household that participates in the most fishing.

Main diarists aged 30 to 44 years old had the highest uptake rate (77 per cent), while diarist aged 60 or older and 45 to 59 years had the highest completion rate (80 per cent and 79 per cent respectively). Completion rate generally increased as education level increased, except those whose highest attained education was year 12 had the lowest completion rate of 68 per cent. Number of days fished in the 12 months prior to the diary was collected at the screening survey stage. Completion rate was lowest for households that fished over 20 or more days in the 12 months prior (68.9 per cent).

Table 8 **Diary conversion by demographics of main diarist**

Demographics of main diarist	Eligible for diary	Accepted welcome pack	Diary stage started	Diary stage completed	Uptake rate % eligible	Completion rate % uptake
Total	3,475	2,640	2,529	1,890	72.8	74.7
Gender						
Male	2,430	1,848	1,783	1,343	73.4	75.3
Female	1,030	785	739	543	71.7	73.5
Other or unknown	15	7	7	4	46.7	57.1
Age						
15-29 years	448	320	306	169	68.3	55.2
30-44 years	920	729	712	523	77.4	73.5
45-59 years	1176	916	880	695	74.8	79.0
60+ years	922	672	628	500	68.1	79.6
Unknown	9	3	3	3	33.3	100.0
Country of birth						
Australia	2,940	2,254	2,164	1,617	73.6	74.7
Other English-speaking country	311	235	225	173	72.3	76.9
Other non-English speaking country	206	143	132	95	64.1	72.0
Unknown	18	8	8	5	44.4	62.5
Highest level of education						
Primary / secondary; not year 12	636	483	458	332	72.0	72.5
Year 12	503	361	347	237	69.0	68.3
Vocational or Trade qualifications	1,334	1,053	1,013	758	75.9	74.8
Higher education / university degree	630	481	459	368	72.9	80.2
Post graduate qualification	302	231	224	175	74.2	78.1
Other or unknown	70	31	28	20	40.0	71.4
Days fished 12 months prior						
0 days	629	447	414	308	65.8	74.4
Less than 5 days	833	615	583	451	70.0	77.4
5 to 9 days	591	450	437	339	73.9	77.6
10 to 14 days	464	360	347	263	74.8	75.8
15 to 29 days	202	161	156	121	77.2	77.6
20 or more days	753	606	591	407	78.5	68.9

* Days fished 12 months prior was unknown for 3 eligible households and 1 household completing the diary

Table 9 presents diary response by two sample type classifications. The sample frame indicates how the household was selected based on the frame generated for the screening survey and subsequently diary recruitment. While household type is characterised by type of phone use as stated by the main respondent during the screening survey. Those selected via the RDD Mobile frame had the highest uptake rate (70 per cent) while the RDD Landline frame had the highest completion rate (80 per cent). Households with a mobile only had the lowest completion rate (72 per cent).

Table 9 Diary conversion by sample frame

Sample type	Eligible for diary	Accepted welcome pack	Diary stage started	Diary stage completed	Uptake rate % eligible	Completion rate % uptake
Total	3,475	2,640	2,529	1,890	72.8	74.7
Sample frame*						
RDD Landline	907	660	619	495	68.2	80.0
RDD Mobile	759	550	529	364	69.7	68.8
Listed Mobile	1,809	1,430	1,381	1,031	76.3	74.7
Household type^						
Mobile & landline	1,778	1389	1323	1024	74.4	77.4
Mobile only	1,624	1,222	1,179	844	72.6	71.6
Landline only	66	29	27	22	40.9	81.5

* sample frame generated for the screening survey

^ collected in the screening survey (7 eligible for diary households refused to answer this question)

Table 10 presents the demographic characteristics of main diarists that completed the 12-month diary by their household type. Households with a landline only made up 1.2 per cent of households completing the diary so interpretation of these results should be taken with caution.

Table 10 Completed diary by household type

Demographics of main diarist completing the diary stage	All completing households		Mobile & Landline		Mobile only		Landline only	
	n	%	n	%	n	%	n	%
Total diary stage completed	1,890	100.0	1,024	54.2	844	44.7	22	1.2
Gender								
Male	1,343	71.1	746	72.9	579	68.6	18	81.8
Female	543	28.7	277	27.1	262	31.0	4	18.2
Other or unknown	4	0.2	1	0.1	3	0.4	0	0.0
Age								
15-29	169	8.9	63	6.2	105	12.4	1	4.5
30-44	523	27.7	223	21.8	298	35.3	2	9.1
45-59	695	36.8	421	41.1	271	32.1	3	13.6
60+	500	26.5	317	31.0	167	19.8	16	72.7
Unknown	3	0.2	0	0.0	3	0.4	0	0.0
Country of birth								
Australia	1,617	85.6	883	86.2	714	84.6	20	90.9
Other English-speaking country	173	9.2	84	8.2	87	10.3	2	9.1
Other non-English speaking country	95	5.0	55	5.4	40	4.7	0	0.0
Unknown	5	0.3	2	0.2	3	0.4	0	0.0
Highest level of education								
Primary / secondary; not year 12	332	17.6	194	18.9	131	15.5	7	31.8
Year 12	237	12.5	134	13.1	101	12.0	2	9.1
Vocational or Trade qualifications	758	40.1	403	39.4	347	41.1	8	36.4
Higher education / university degree	368	19.5	179	17.5	185	21.9	4	18.2
Post graduate qualification	175	9.3	107	10.4	67	7.9	1	4.5

Other or unknown	20	1.1	7	0.7	13	1.5	0	0.0
Days fished 12 months prior								
0 days	308	16.3	158	15.4	142	16.8	8	36.4
Less than 5 days	451	23.9	225	22.0	223	26.4	3	13.6
5 to 9 days	339	17.9	192	18.8	143	16.9	4	18.2
10 to 14 days	263	13.9	149	14.6	112	13.3	2	9.1
15 to 29 days	121	6.4	64	6.3	57	6.8	0	0.0
20 or more days	407	21.5	235	22.9	167	19.8	5	22.7

* Days fished 12 months prior was unknown for 1 mobile & landline household completing the diary.

6.1.4. Mode of participation

The diary was available to complete both online and over the phone (CATI) and just over half of households completing the 12-month diary utilised both modes to log their diary entries. One quarter of all households logged their fishing entries exclusively online. Of those, 24 per cent completed 1 to 6 entries compared with 38 per cent of those completing via both online and CATI. Half of the households that completed exclusively over the phone confirmed no fishing over the 12 months, compared to just over one third over those exclusively completing online.

Of all the fishing and no fishing entries logged, over half were completed online. It is important to note that one diary entry can result in multiple split events as explained in section 4.3 of this report. Diary entry here refers to the one session per fishing trip logged.

Table 11 Diary entries by mode

	Online	CATI
Proportion of all fishing entries	57.7	42.3
Proportion of all did not go fishing contact	53.6	46.4
Average time to record a fishing entry	5 mins	7 mins
Average time to record a no-fishing entry	1-2 clicks	3 mins

Table 12 Households completing diary stage by mode

	Total		Both		Online only		CATI only	
	n	%	n	%	n	%	n	%
Total completed diary	1,890	100	1047	55.4	454	24.0	389	20.6
Fished over 12 months	1,114	58.9	682	65.1	239	52.6	193	49.6
Logged 1 fishing entry	321	17.0	166	15.9	72	15.9	83	21.3
Logged 1 to 6 entries	592	31.3	402	38.4	110	24.2	80	20.6
Logged 7+ entries	201	10.6	114	10.9	57	12.6	30	7.7
No fishing over 12 months	776	41.1	365	34.9	215	47.4	196	50.4

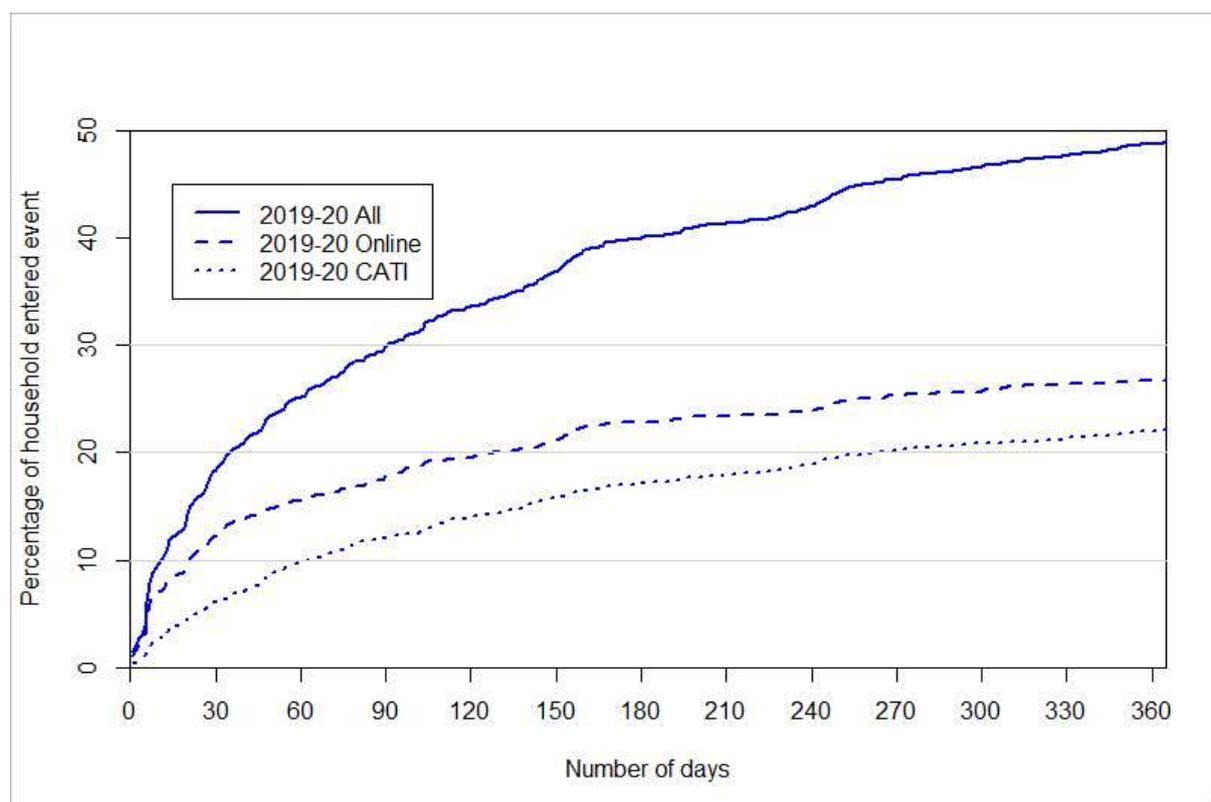
Table 13 shows the time taken to record an entry for all diary entries recorded by mode of completion. Almost three quarters of all entries were logged within one month of when the fishing activity took place. For online entries this was 81 per cent and for CATI 62 per cent. The longer time to respond for CATI entries could be attributed to the online cohort being followed up in CATI after some time due to time between prior email and SMS reminders.

Table 13 Time taken to record fishing trip

Fishing entry recorded within... (cumulative)	Total		Online		CATI	
	n	%	n	%	n	%
1 week	1,736	37.0	1,314	48.5	422	21.2
1 month	3,432	73.1	2,202	81.3	1,230	61.9
3 months	4,324	92.1	2,582	95.3	1,742	87.6
6 months	4,612	98.2	2,684	99.1	1,928	97.0
6 months +	4,696	100.0	2,708	100.0	1,988	100.0

Figure 5 below reports on the cumulative proportion of households by date of first reported fishing entry, by mode. Of the 2,529 households starting the diary, one fifth had reported fishing in the first 30 days of the survey and just under half reported fishing by the end of the 360 days. Online and CATI here relates to the mode by which their first fishing entry was completed. Households completing their first entry online were much quicker in uptake compared with those responding over the phone.

Figure 5 Proportion of all households by date of first reported fishing event, by mode



Base = 2,529 households starting the diary

6.2. Exit survey response

The wash-up stage (exit survey) forms phase three of the SRFS 2019/20. Upon completion of the final diary and confirming all fishing activity logged over the 12 months, an exit survey was conducted to collect household information on economics, awareness, attitudinal and other data related to recreational fishing in Queensland, not otherwise collected in the 12-month diary. See Appendix 4 for the exit survey questionnaire.

As part of the wash-up stage effort, all households that completed the diary were eligible to take part in the exit survey. Of the 1,890 eligible households, 72 per cent agreed to answer all questions in the exit survey. The completion rate ranged from 53 per cent in Northern Queensland to 79 per cent in Darling Downs.

Table 14 Wash-up stage participation by region

Region	Diary completed	Exit survey completed	Exit survey completion rate %
Total	1,890	1,358	71.9
Brisbane	551	395	71.7
Gold Coast	169	120	71.0
Sunshine Coast	123	86	69.9
West Moreton	88	62	70.5
Wide Bay-Burnett	129	96	74.4
Darling Downs	141	112	79.4
Central W / North W / South W	81	61	75.3
Gladstone	53	40	75.5
Rockhampton	93	66	71.0
Fitzroy Hinterland	37	23	62.2
Mackay Whitsunday	82	60	73.2
Mackay Hinterland	45	31	68.9
Townsville	83	59	71.1
Northern	36	19	52.8
Cairns	93	73	78.5
Far North Queensland	86	55	64.0

6.3. Non-intending survey response

The non-intending survey also forms phase three of the SRFS 2019/20, with this survey aiming to measure unexpected fishing activity. Households that said they did not intend to fish at the screening survey stage and agreed to follow-up were re-contacted 12 months later to confirm any unexpected fishing. See Appendix 5 for the non-intending survey questionnaire.

The response rate, that is interviews as a proportion of all interviews and refusals, was 92 per cent, which ranged from 83 per cent in Central West / North West / South West region to 95 per cent in the Fitzroy Hinterland region.

Table 15 Non-intending survey participation by region

Region	Selected for NI survey	Completed NI survey	Response rate %
Total	2,299	1,500	92.3
Brisbane	836	561	94.4
Gold Coast	212	128	94.1
Sunshine Coast	196	120	90.2
West Moreton	49	36	90.0
Wide Bay-Burnett	173	119	90.8
Darling Downs	107	68	88.3
Central W / North W / South W	55	34	82.9
Gladstone	50	27	84.4
Rockhampton	76	48	87.3
Fitzroy Hinterland	29	20	95.2
Mackay Whitsunday	120	81	94.2
Mackay Hinterland	30	19	90.5
Townsville	112	71	92.2
Northern	33	19	90.5
Cairns	117	80	93.0
Far North Queensland	104	69	92.0

7. Data Outputs & Reporting

7.1. Relational data tables

The data for the survey is stored in twenty-one relational tables. A brief description of each is provided below:

Table	Description
Household	Survey information about households
Persons	Demographic information about respondents
Fishing Parties	Groups fishing for each diary event
Fishing Events	Details of each fishing event
Dates Fished	Dates fished for each method within a diary event
Catch Events	Species, catch/release numbers and reasons for release for each diary event
Trip Costs	Cost associated with the events in each diary broken down by category
Yearly Costs	Costs for non-trip-related expenses collected in the exit survey
Washup	Other data items collected in the exit survey
NIC households	Household fishing status collected from the non-intending follow-up survey
NIC persons	Personal fishing status collected from the non-intending follow-up survey
No Fishing	Date of any “Haven’t been fishing” response by a household
Method Codes	Concordance between different levels of aggregation for method coding
Body Codes	Description of the body codes
Platform Codes	Concordance between different levels of aggregation for platform coding
Species Codes	Concordance between CAAB code, logical group, standard name and scientific name
Region Concordance	Concordance between 2019/20 subregion code and 2013/14 fishing regions
Phase 1 verbatims	Open-ended text responses to screening survey items collecting country of birth and education
Phase 2 verbatims	Open-ended text responses to the diary item for other fishing methods
Phase 3 verbatims	Open-ended text responses to various items from the exit survey

Further details of each table can be found in Appendix A of the Data User Guide. Additionally, data for cases deleted from the final phase 2 and 3 outputs for incompleteness can be found in a series of tables prefixed with an ‘x’.

7.2. Data preparation

The relational data file was prepared and updated fortnightly and error checking was undertaken by the Department to ensure the data for each catch event or fishing event was logical. For example, checking that the species recorded matched the region or waterbody listed, checking that the species name matched the species CAAB code listed and checking for further details on generic species recorded by the diarist. As such, these errors or queries were subsequently followed up with the fisher to collect further details on the catch event or to help to identify the species more accurately. When potential alternative species names were known to the Department, the diarist was offered an online form to select the species name they thought was correct. In other circumstances, the diarist was emailed or called with the follow up query.

Of all the follow up queries made to diarists, approximately 58 per cent were able to provide a specific species or correction to their catch event or fishing event. Corrections that could be made without follow up were provided by the Department on an ongoing basis. Approximately 11 per cent of all fishing and catch events required a revision as provided by the Department. Overall, approximately 17 per cent of all catch events required re-coding, whether that was based on a correction from the Department, the result of an update to the species list, or based on a change made from a diarist.

7.3. Weighting

7.3.1. Phase 1 weight

The broad approach recommended for this survey is based on the work of Valliant et al. (2013)³ with adjustments for dual-frame sample design and the presence of listed sample within the mobile frame.

This involved the following steps:

1. A base weight is calculated as the product of two weights:
 - a. A design weight, calculated to account for the probability of being sampled into the survey; and
 - b. A non-response weight, accounting for the estimated chance of participation using the subset of items collected for both respondents and refusals (refer to Section 3 for more details).
2. The base weight is then adjusted using generalised regression so that the final weight conforms to population benchmarks.

This adjustment compensates for uneven chances of selection into the survey due to the dual-frame design and presence of listed mobiles in the mobile frame, as well as non-response to the survey by age, education, gender, telephone status, country of birth and region.

See the SRFS 2019-20 Screening Survey - Technical Report (June 2020) for further details on the design weight, non-response adjustment and final calibration.

³ Valliant, R., J.A. Dever, and F. Kreuter (2013). *Practical Tools for Designing and Weighting Sample Surveys*. New York, NY, USA: Springer

7.3.2. Phase 2 adjustment

Determining completes

Finalising the Phase 2 data requires determining which households returned reliable information through the diary process and which households appear to have dropped out at some stage of the survey. This is made more complex because households' fishing behaviour can follow any pattern. For example, a household that indicated they had high avidity in the screening survey and returned diaries regularly through 6 months of the diary—but stopped logging diaries after that—may have paused their fishing for some reason or they may have decided to drop out of the survey possibly by ignoring further communication.

However, households had several chances to engage with the survey even if they had no fishing to report. All reminder communications gave households an option of lodging a “no fishing” response. In addition, the exit survey offered another opportunity to determine which households simply stopped responding and which had stopped responding because they were not fishing. The exit survey additionally asked respondents what proportion of their fishing activities they logged in the diary with responses for “all”, “most”, “some” and “none” as well as “didn't go fishing”, “don't know” and “refused”. Finally, households could opt out of the survey at any time. Table 16 shows the final activation status of households who consented to the diary during the screening survey.

Table 16 Final activation status of diary households

	Frequency	Percentage
Active / no opt-out	2,327	88.1
Opt-out	171	6.5
Unable to continue	28	1.1
Deceased	3	0.1
Duplicate	2	0.1
Opt-out prior to diary	109	4.1
Total accepted welcome pack	2,640	100.0

Opt-outs, duplicates and refusals should all be considered as incomplete or missing data. However, the circumstances around decedents and those unable to continue (e.g. due to illness, moving out of state) is less clear. These are people who were an eligible part of the population and consented to be part of the study but became unable to fish in Queensland. As such, their data should be considered as part of the survey.

To understand what the respondents' exit survey assessment of their data quality might indicate about their data, a simple regression analysis was performed predicting the number of dates fished in their diary responses from the screening survey, number of days fished in the previous year for the most avid fisher in the household, the number of likely fishers in the household and the respondent's exit assessment of their data quality. In the model, the coefficients assigned to each level of the assessment question relative to those who reported all their fishing will give an estimate of the average number of dates by which they underreported their fishing. All respondents who indicated they reported “none” of their fishing or that they didn't go fishing, did indeed report no fishing, so these cases were not included in the analysis. This regression estimated that compared to households that reported “all” of their fishing, households that reported “most” of their fishing reported an extra 0.8 days of fishing on average relative to expectations. Respondents that reported “some” of their fishing underreported by approximately 2.1 days on average. Only 16 cases reported they didn't know if they reported all their fishing, or refused to answer, though these displayed a similar level of underreporting

to the “some” households. So, respondents who reported “all” or “most” of their fishing can be considered to have complete data for the diary phase, as well as those that reported “no fishing”, while respondents who reported “some” or “none” of their fishing (or didn’t answer the question) can be considered to have incomplete data.

The final group of households to consider are active households that didn’t return an exit survey. For these, the only indication of their diary quality is their response pattern throughout the diary phase of the survey and whether they gave any response to wash-up communications. Greater emphasis was placed on households finalising their diary entries than completing the exit survey, so households that gave diary or non-fishing responses after wash-up communications should be considered as having “completed” the diary and will be included as having given a “wash-up response”. Table 17 gives the response status to the wash-up effort broken down by time since their previous recorded response (either “non-fishing” or a completed diary).

Table 17 Response status to wash-up materials by pre-washup time since last response among active households

Time since last response pre-wash-up	Number of active households	Number with any wash-up response	Any wash-up response rate	Number returning exit survey	Exit survey response rate	Percentage indicated reliable data
< 50 days	1,333	1,267	95.0	979	73.4	96.8
50 - < 100 days	361	315	87.3	227	62.9	93.4
100 - < 150 days	141	101	71.6	55	39.0	87.3
150+ days	291	163	56.0	84	28.9	91.7
No response	201	44	21.9	13	6.5	84.6
Total	2,327	1,890	81.2	1,358	58.4	95.4

Wash-up non-respondents can be assumed to be divided between those who were still engaged with the survey and returning reliable diary data and those that had disengaged from the survey and were no longer accurately reporting their fishing. Table 18 uses the information in Table 17 to give an indication of the reliability of the data returned by the non-wash-up-responding cases for categories of respondents based on their time since last response prior to the wash-up effort. If it is assumed that the households who responded to the diary within 50 days before the exit survey were all reasonably engaged with the survey, then 95.0 per cent of engaged households were expected to have responded to the wash-up materials. Therefore, the number of engaged non-responding households for respondents with other times since their last response will be the number of wash-up responding households divided by 0.95 minus the number of wash-up responding households for their time category. The percentage of each of these that would have reported returning complete data (called good engaged non-respondents) can be estimated by the proportion of wash-up survey responses reporting good data. This means we can estimate the proportion of “good” cases among those not returning wash-up responses as this figure compared to the overall number of wash-up non-responses. These calculations indicate that only households with responses in the 50 days in the lead up to the wash-up can be relied upon to have returned good data prior to this among respondents who didn’t make a response to the wash-up activity.

Table 18 Calculating likely status of active cases not responding to wash-up effort

Time since last response pre-wash-up	Number active	Number with any wash-up resp.	Number without any wash-up resp.	Engaged non-resp.	Percent indicated reliable data	Good engaged non-resp.	Percent good engaged non-resp.
	A	B	C	$D = (B / .95) - B$	E	$F = D * E$	$G = F / C$
< 50 days	1,333	1,267	66	66	96.8	64	96.8
50 - < 100 days	361	315	46	16	93.4	15	33.3
100 - < 150 days	141	101	40	5	87.3	5	11.5
150+ days	291	163	128	8	91.7	8	6.1
No response	201	44	157	2	84.6	2	1.2

Table 19 shows the final response status numbers suggested by these calculations. The final response statuses are as follows:

- Exit survey indicates good data.** This is the total number of cases returning an exit survey from Table 17 multiplied by the proportion indicating they completed diaries “all” or “most” of their fishing events or did not go fishing.
- Wash-up response without survey.** This is the total number with any wash-up response minus those that completed an exit survey from Table 17.
- Recent response prior to wash-up.** This is the number of respondents who were in contact with the survey less than 50 days prior to wash-up but who did not return an exit survey.
- Could not complete.** This consists of the decedents and those who could not complete the survey for other reasons (e.g. health, moving out of state) from Table 16.
- Opt-outs.** These are the pre- and during-diary opt-outs from Table 16 as well as those refusing all communications. For simplicity opt-outs were also included in this category.
- Exit survey indicates bad data.** This is the number of cases returning an exit survey from Table 17, excluding those who returned “good” data above.
- No recent response.** This is the sum of the number of households without any wash-up response from Table 18 for the rows indicating 50 or more days since their last response prior to the wash-up.

Table 19 Proposed final response status

Final status	Households	Returned diary		Non-fishing response only		No response	
		n	%	n	%	n	%
Exit survey indicates good data	1,296	797	61.5	499	38.5	-	0.0
Wash-up response without survey	532	274	51.5	258	48.5	-	0.0
Recent response prior to wash-up	66	28	42.4	38	57.6	-	0.0
Could not complete	31	3	9.7	6	19.4	22	71.0
Total Included	1,925	1,102	57.2	801	41.6	22	1.1
Opt-outs	282	16	5.7	59	20.9	207	73.4
Exit survey indicates bad data	62	42	67.7	20	32.3	-	0.0
No recent response	371	78	21.0	136	36.7	157	42.3
Total excluded	715	136	19.0	215	30.1	364	50.9
Grand total	2,640	1,238	46.9	1,016	38.5	386	14.6

Determining 2019/20 Influx and Outflux

The second phase of determining the fishing estimates is determining the estimates of influx (i.e. households that indicated they were unlikely to do any fishing at the screening survey who wound up fishing) and outflux (likely fishing households who wound up not fishing) to determine the overall estimate for number of days fished in Queensland in 2019/20.

As can be seen in Table 20, this is determined in two parts. First, a weighted estimate for the households intending to fish is determined from the diary data. The process is as follows:

- 1) Filter the phase 1 data to intending (diary eligible) households
- 2) Weight the data to adjust for non-response to the diary. Because population figures are not available for fishing households, the weighted screening survey data is used to obtain population benchmarks for intending households for the phase 1 weighting variables. To better adjust for avidity the refusal conversion benchmark for overall household fishing is replaced by the number of days fished in Australia at the individual level. So, the benchmark variables used are: telephone status, education by age, gender, country of birth, household count by region and number of days fished in Australia in 2018/19. Note that the first four of these are not cross-classified by region as they were for the phase 1 weight. This is because the output fishing benchmark is not required to be broken down by region, so fitting at the regional level might introduce more error than it solves. The household count by region benchmark will compensate for overall regional differences in response rate.
- 3) Filter the screening survey data to intending households that were phase 2 completes and add the number of days they fished in 2019/20 based on their diary responses. An extra sub-step here includes the households who indicated they reported none of their fishing at the exit survey. These households were asked to estimate the level of fishing for each member of the household. This represents 45 fishers from 17 households, so their inclusion or exclusion is unlikely to have a meaningful effect on the weights.
- 4) The data from Step 3 is then weighted to conform to the benchmarks from Step 2.
- 5) A weighted estimate for the number of days fished by intending households is obtained.

The process is similar for the non-intending households:

- 1) Filter the phase 1 data to non-intending (diary ineligible) households.
- 2) Use the phase 1 weight to obtain population benchmarks for non-intending households for the same weighting variables used for the intending fishing households⁴.
- 3) Filter the screening survey data to cases with a non-intending call-back completion and add their number of days fished information from the non-intending call-back.
- 4) The data from Step 3 is then weighted to conform to the benchmarks from Step 2.
- 5) A weighted estimate for the number of days fished by non-intending households is obtained.

The estimate for the number of days fished benchmark calculated from this process can be seen in Table 20. Based on weighted estimates for intending and non-intending samples (not shown in the table), influx was 103,897 households while outflux was 199,960 households. This means that the

⁴ Small numbers of people fell into the category of coming from a non-intending household, but having fished for “15 to 20 days”, or “20 or more days” in 2018-19, so these were combined with the “10 to 15 days” category to form a “10 or more days” category for the purpose of weighting.

estimate for the proportion of Queenslanders fishing in the state for 2019-20 (13.0 per cent) is lower than that for 2018-19 estimated from the screening survey (18.7 per cent).

Table 20 Calculations for number of days fished in 2019-20 benchmark

Days fished 2019-20	Intending households		Non-intending households		Combined	
	No. people	%	No. people	%	No. people	%
0 days	993,873	66.2	3,381,852	95.7	4,375,724	86.9
Less than 5 days	364,949	24.3	121,702	3.4	486,651	9.7
5 to 9 days	89,980	6.0	13,124	0.4	103,104	2.0
10 to 14 days	26,723	1.8	4,752	0.1	31,475	0.6
15 to 19 days	10,753	0.7	10,513	0.3	21,265	0.4
20 or more days	14,683	1.0	239	0.0	14,922	0.3
Total	1,500,960	100.0	3,532,181	100.0	5,033,141	100.0

Final Phase 2 Weighting

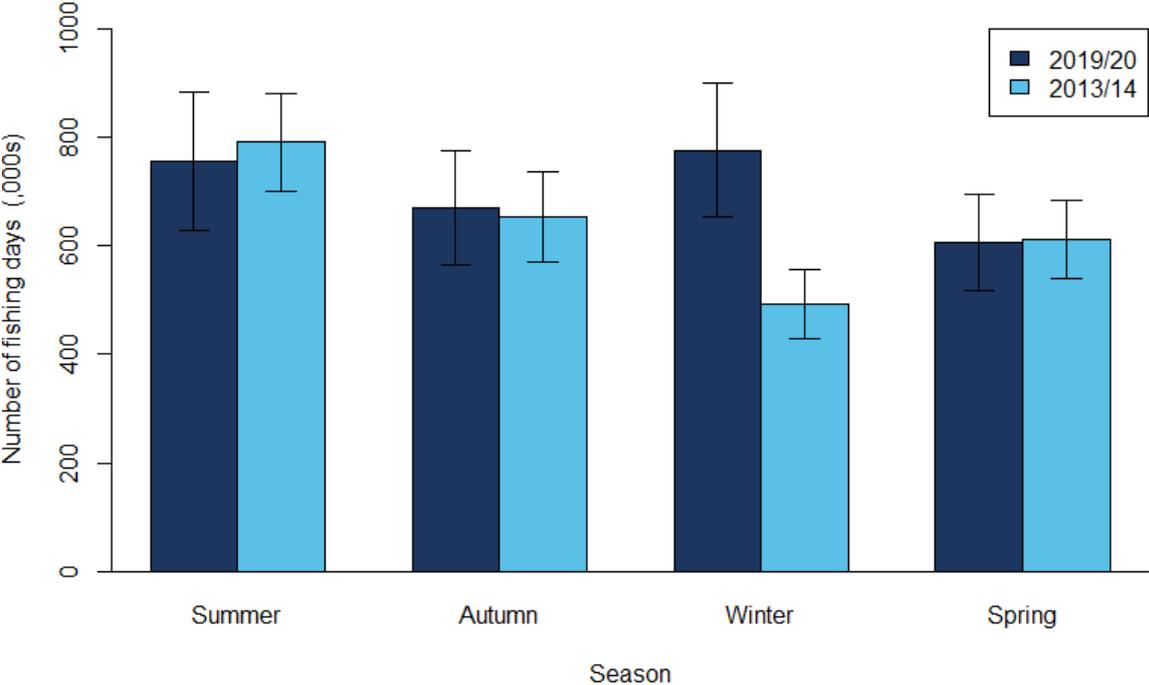
The final phase 2 weight is a calibration of the phase 1 weight using the same population totals as phase 1, except the more nuanced individual number of days fished in Australia in 2019/20 replaces the fishing household benchmarks used to adjust for refusal conversion at phase 1, plus the number of days fished benchmark from Table 20 above. The final benchmarks are region by telephone status, region by education by age, region by sex, region by country of birth, household count by region, days fished in Australia in 2018/19 and days fished in QLD in 2019/20. The data to be weighted is limited to non-intending households and intending households with “complete” diaries.

7.4. Fishing estimates

7.4.1. Overall estimates

Comparing the results from the weighting with the 2013/14 report, the estimate for the number of days fished is 2.8 million in 2019/20 (SE 0.2 million) compared to 2.5 million (SE 0.1 million) in 2013/14. This difference seems to be mainly due about 10 per cent population growth in addition to higher avidity from fishers who are reporting (4.3 events per fisher compared to 3.6 in the 2013/14 report). However, the 2018-19 data shows different seasonality when compared to the 2013-14 data, with most of the extra fishing occurring in the winter months (see Figure 6). The 2013/14 survey was collected from November to October, so was freshest for respondents in summer, while the 2018-19 data was collected from May to April, with the early stages of diary collection being in the winter.

Figure 6 Seasonality estimates



Changes in coding between the categories used for reporting between 2013/14 and the current survey make comparisons of species catch more difficult, however Table 21 shows the comparison for the species groups with the same name between the two. Although there was a lot of variation for different species, the estimates are broadly comparable for most species.

Table 21 Catch counts by species comparing 2019-20 with 2013-14

Species	Caught			Kept			Released		
	2019-20	2013-14	Change %	2019-20	2013-14	Change %	2019-20	2013-14	Change %
Bream	1,503,000	1,417,000	+6.1	428,000	397,000	+7.9	1,075,000	1,000,000	+7.5
Whiting	1,292,000	1,783,000	-27.6	733,000	997,000	-26.5	559,000	785,000	-28.8
Crab	1,072,000	1,976,000	-45.7	254,000	457,000	-44.5	818,000	1,500,000	-45.4
Yabby - marine	910,000	3,600,000	-74.7	627,000	3,300,000	-81.0	283,000	318,000	-11.0
Prawn	816,000	2,400,000	-66.0	763,000	2,300,000	-66.8	52,000	60,000	-12.8
Tropical snapper and sea perch	815,000	653,000	+24.8	256,000	216,000	+18.6	559,000	437,000	+27.9
Herring and Pilchard	702,000	466,000	+50.6	436,000	361,000	+20.7	266,000	105,000	+153.7
Trevally and amberjack	562,000	520,000	+8.2	117,000	188,000	-37.9	446,000	332,000	+34.3
Flathead	440,000	412,000	+6.9	148,000	139,000	+6.6	292,000	273,000	+7.0
Emperor	404,000	201,000	+101.1	171,000	97,000	+76.1	233,000	104,000	+124.4
Snapper	385,000	203,000	+89.8	83,000	56,000	+48.0	302,000	148,000	+104.3
Mullet	355,000	243,000	+46.1	210,000	216,000	-2.8	145,000	27,000	+437.2
Yabby - freshwater	334,000	520,000	-35.8	268,000	479,000	-44.2	66,000	41,000	+61.4
Tailor	324,000	170,000	+90.6	102,000	111,000	-8.0	222,000	59,000	+276.0
Finfish - other	313,000	1,100,000	-71.5	79,000	681,000	-88.5	234,000	384,000	-38.9
Cod and Groper	307,000	242,000	+27.0	34,000	36,000	-4.2	273,000	206,000	+32.4
Catfish	228,000	452,000	-49.6	8,400	37,000	-77.3	219,000	415,000	-47.1
Coral trout	222,000	170,000	+30.9	135,000	103,000	+31.0	88,000	66,000	+32.6
Javelin	192,000	383,000	-49.8	54,000	107,000	-49.6	138,000	276,000	-49.9
Mackerel	183,000	155,000	+18.2	123,000	100,000	+23.3	60,000	55,000	+9.1
Barramundi	179,000	174,000	+3.0	33,000	42,000	-20.7	146,000	132,000	+10.6
Grunter and Trumpeter	173,000	143,000	+21.0	14,000	41,000	-66.1	159,000	102,000	+56.1
Mollusc	167,000	560,000	-70.2	128,000	553,000	-76.9	39,000		
Shark and ray	135,000	193,000	-29.9	2,800	6,400	-56.1	132,000	186,000	-28.8
Garfish	83,000	104,000	-20.4	73,000	94,000	-22.5	10,000	10,000	-0.1
Cephalopod	80,000	26,000	+207.2	72,000	23,000	+212.4	8,000		
Jewfish	70,000	121,000	-42.3	19,000	37,000	-48.4	51,000	84,000	-39.5
Morwongs and Sweetlips	65,000	73,000	-10.9	34,000	30,000	+13.4	31,000	43,000	-27.8
Pearl perch	47,000	25,000	+86.2	15,000	11,000	+32.2	32,000	14,000	+128.7
Tuna	43,000	13,000	+229.5	18,000	7,600	+132.1	25,000		

Species	Caught			Kept			Released		
	2019-20	2013-14	Change %	2019-20	2013-14	Change %	2019-20	2013-14	Change %
Pike	31,000	33,000	-7.1	7,100	14,000	-49.6	24,000	19,000	+24.3
Wrasse	21,000	67,000	-69.3	4,500	23,000	-80.6	16,000	44,000	-63.4
Eel	11,000	27,000	-59.3	-	-	-	11,000	25,000	-56.1
Cobia	3,400	7,600	-54.9	2,200	5,400	-59.9	1,300	2,200	-42.7

Note: Blank cells represent species where there was greater than 50% relative standard error in 2013/14 that were not reported.

7.4.2. Effect of adding mobile sample

To determine the effect of adding mobile sample a separate set of weights were calculated for the landline cases only. Table 22 shows the effect this had on a range of estimates for the study. The mobile sample added to the estimates by around 20 per cent for days and hours fished and number of fishers and by significantly more than that for annual trip costs, however the landline-only estimates were slightly higher for trip cost, although this might be an anomaly generated by the low sample size and high variability in cost estimates.

Table 22 Effect of moving to a dual frame design on non-catch survey estimates

Estimate	Full sample		Landline cases only	
	Total	95% CI	Total	95% CI*
Days fished	2.8M	± 0.3M	2.3M	±0.6M
Hours fished by line or spear	10.2M	1.3M±	8.5M	±2.8M
Number of people fished	659K	±61K	503K	±115K
Annual trip costs	\$107M	±\$14M	\$117M	±\$51M
Annual other costs	\$1.1B	±\$0.4B	\$0.5B	±0.2B

*Note: Confidence Intervals here are indicative of the low sample size when excluding cases recruited by mobile. They are included to give an indication of the accuracy of the figures, not how accurate they would have been had landline sample been used for the whole survey.

In looking at the effect of catch estimates it is best to look at this within the context of species. Table 23 shows the numbers caught, kept and released of the 5 most targeted species. Numbers caught, kept and released were consistently higher for the combined mobile and landline samples than those obtained when just the landline sample was used.

Table 23 Catch estimates of most targeted species obtained from dual frame and landline only samples ('000s)

	Caught				Kept				Released			
	Full		Landline		Full		Landline		Full		Landline	
	Tot	95%	Tot	95%	Tot	95%	Tot	95%	Tot	95%	Tot	95%
Barramundi	179	81	114	102	33	15	15	14	146	71	99	92
Crab	1,072	469	841	487	254	89	169	94	818	389	673	411
Flathead	440	171	251	189	148	53	76	45	292	141	175	156
Tropical snapper	815	243	597	293	256	66	188	78	559	202	409	231
Whiting	1,292	434	709	396	733	308	404	313	559	171	305	137

Legend: Tot = Total, 95% = 95% confidence interval, Full = full mobile and landline sample, Landline = Landline cases only.

Note: table 22 note on the size of the landline sample confidence intervals.

7.4.3. Diary complexity

One way of determining the quality of the diary responses is to look at the level of detail respondents provided in lodging diary events that involved multiple characteristics. Table 24 looks at the number of methods, platforms and regions each fisher reported having for each date diarised. To compare like with like across surveys the 3-category platform code was used, as was region, rather than subregion. Few fishers fished in more than one region on any given day, with 1 per cent or less of person days⁵ occurring across multiple regions in both surveys. Likewise, results for the number of platforms used each day were similar between the two surveys. The most common source of variance within a single day's fishing for respondents in both surveys was using multiple methods of fishing, which was recorded for 40 per cent of all person days in 2019/20 compared to only 15 per cent in 2013/14.

Table 24 Diversity of characteristics of fishing dates by individual respondents across the 2019/20 and 2013/14 surveys

Number	Methods used (%)		Platforms used (%)		Regions visited (%)	
	2019/20	2013/14	2019/20	2013/14	2019/20	2013/14
1	60.9	85.1	95.9	95.6	99.4	99.0
2	29.8	13.7	4.1	4.5	0.5	1.0
3	8.2	1.2	0.1	0.0	0.0	0.0
4	1.2	0.1	0.0	0.0	0.0	0.0

To further explore this difference an analysis was performed with the 2019-20 data across survey modes. Because the responses were not being compared to 2013-14 data, the more detailed codes of 5-category platform and sublocation can be used and body type can be included. Generally, responses were of similar complexity across the two response types, although the online diaries were consistently slightly more complex.

Table 25 Diversity of characteristics of fishing dates by individual respondents across survey modes

Number	Methods used (%)		Platforms used (%)		Regions visited (%)		Body types visited (%)	
	Online	CATI	Online	CATI	Online	CATI	Online	CATI
1	59.8	62.5	90.6	93.8	97.0	98.5	95.6	98.4
2	30.5	28.7	7.8	6.2	2.6	1.5	4.2	1.6
3	8.2	8.1	1.6	0.1	0.2	0.0	0.2	0.0
4	1.5	0.8	0.0	0.0	0.1	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0

Note: Excludes a small number of cases where an online and CATI diary was lodged for the same person on the same days fishing.

⁵ A person day is a single day's fishing for each person, so two people on a two-day fishing trip would count as four person days.

8. Suggestions for future improvement

The following suggestions are made to improve methodological aspects and operational procedures for future fishing diary surveys.

Diary fieldwork

1. The high proportion of diaries completed on a mobile device provides options to adapt the communications strategy in the future. This could involve the design of a smartphone diary application which could be used by researchers as an additional communication channel. The application would be able to send push notification reminders to differentiate from the telephone, mail, email and SMS communications.
2. Send more personalised letters to non-responding households, earlier in field. Majority of non-responders were households that did not respond to the explanation call, so a more personalised approach in the first few months of the diary would have benefited.
3. Consider sending an automated email for consenting diarists during the screening stage interviews as a way of immediate introduction to the diary and to assist with future reminder emails successfully landing in the respondents' inbox.
4. Anecdotal evidence suggests that younger respondents appeared more frustrated by the amount of telephone contact, particularly if they had not ended up doing any fishing. A suggestion could be to send an SMS with the diary link after the first few no answers, encouraging younger people to go online instead.
5. Review the timing of the diary and whether starting before peak fishing periods would benefit initial and long-term engagement. Starting the diary at a time when most respondents are about to fish could also help with reinforcing the behaviour of completing the diary straight after a fishing trip. Another option to consider is having households complete a diary entry for their most recent fishing trip on diary start up, even if it is not used in the final data, to familiarise them and demonstrate the ease of logging an entry at the start of the survey period.
6. Anecdotal feedback suggested that some fishers could not remember how much bait they caught as they were not initially aware this was captured. Feedback (and unknown reliability of data) also suggests that the question on fishing trip expenditure was difficult to answer, especially when out with a larger group. A suggestion would be to place greater emphasis in communications on counting bait as catch and the specific items asked on expenditure to assist with fisher preparedness.

Diary instrument

7. Almost half of the fishing entries completed online were done so on a mobile or tablet device. An even better small screen enabled survey could be considered in future iterations.
8. Consider ways of reducing the diary entry capture to a single mobile screen and significantly reduce diary entry time to less than a few minutes to reduce respondent burden and encourage regular diary completion.
9. A summary of the household's fishing entry history was provided in the final month of the diary period. Some fishers found it difficult to be able to accurately reflect on their past fishing history when provided the summary over the phone. While the 2019/20 survey allowed for the past 5 entries to be displayed in their online diary, a suggestion would be to provide alternative ways for

diarists to look this up in full, when required, or consider additionally sending out a summary at the 6-month mark.

10. Interviewers used a searchable, customised google map, overlaid with the diary's fishing location grid to make selecting the fishing region much easier. During the design of the self-complete online diary, there was some apprehension about the use of google maps without testing useability with diarists. The google map functionality was not implemented to self-completing diarists. In future, it may be the case that most diarists would be able to use a mapping tool to indicate their fishing location and thus it would be appropriate to include this functionality in the diary either as the only option to provide location or in addition to the image-based maps used in the current iteration.
11. Anecdotal feedback was that casual fishers found it difficult to identify specific species while some of the more avid fishers didn't agree with the options provided to them when clarification was sought on the exact species caught. A suggestion would be to integrate more species education into general communications and investigate ways to introduce species-specific prompting in the diary for the common generic species that required follow-up during diary fieldwork.
12. In a similar vein to suggestion 11, the diary survey could be simplified to focus on accurate collection of the top 10 species that are of interest to Fisheries management or other research. This would mean less emphasis on other species to make sure data collected on the most important species are accurate as possible, by minimising respondent burden.
13. Based on the poor response to follow-up queries made to diarists about the fishers' primary target (i.e. specify generic name provided), it is likely not worthwhile following these up as most fishers weren't be able to provide a more specific answer to the type of species they were targeting.

Appendices

Supplied electronically:

Appendix 1 – Welcome pack materials

Appendix 2 – Diary questionnaire

Appendix 3 – Diary briefing session

Appendix 4 – Exit survey questionnaire

Appendix 5 – Non-intending survey questionnaire