

# Appendix 1: Metadata and MPA recreational users' KAP survey template

Here we present a template of the metadata and survey for collecting MPA recreational users' KAP data. This template is tailored to the Geographe, South-west Corner and Ngari Cape Marine Park in the south west of Australia.

## Contents

<u>Metadata</u>	<u>2</u>
<u>MPA recreational users' KAP survey template</u>	<u>5</u>
<u>1. Pre-survey</u>	<u>5</u>
<u>Introduction &amp; Screening</u>	<u>7</u>
<u>Participant information form</u>	<u>8</u>
<u>2. Practice</u>	<u>10</u>
<u>Practice: Fishing</u>	<u>10</u>
<u>Practice: Activity other than fishing</u>	<u>14</u>
<u>Practice: General</u>	<u>16</u>
<u>3. Knowledge</u>	<u>20</u>
<u>4. Attitudes</u>	<u>25</u>
<u>5. Demographics</u>	<u>30</u>

# Metadata

Metadata here refers to data about the sampling shift (i.e., who surveyed where and when). Recording metadata is essential to calculate sampling effort, to appropriately weight data during analysis (see Appendix 4) and to understand sampling biases and representativeness.

Each surveyor must individually fill out the metadata for every shift. This is to ensure sampling effort can be accurately calculated in circumstances where surveyors finish at different times. At the beginning of a shift, each surveyor should individually enter metadata for questions M1 - M7, with question M8 and M9 being entered at the end of a shift.

While metadata can be recorded on paper, we recommend that metadata are collected digitally to avoid manual digitisation post-collection.

## M1. Start Time (date-time - see Fig A1.1)

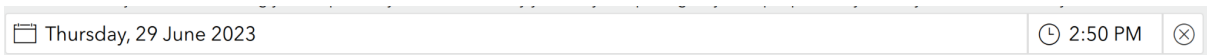


Fig A1.1. Example of how date-time questions are displayed in Survey123.

## M2. Surveyor (single choice)

- Matt - UWA
- Nicole - UWA
- Joe - Undulap
- Other

[If M2 = Other] M2a. Other\_\_\_\_\_ (free text)

Single choice options in M2 should include a list of every surveyor and their institution.

In question M2a, surveyors should enter their name and institution consistently in all metadata and pre-surveys, to reduce post-collection data cleaning.

M3. Are you currently at a boat ramp or shore site? (single choice)

- Ramp
- Shore

In M3 “Ramp” surveys refers to shifts which are dedicated to collecting boat based recreational data and a “Ramp” may include a beach launching location which should be listed in M4.

[If M3 = Ramp] M4. Which ramp? (single choice)

- Port Geographe
- Quindalup
- Dunsborough old
- Augusta

Single choice options for M4 must list all sampling sites targeting boat based recreators, including any beach launching locations.

[If M3 = Ramp] M5. How many empty trailers are at the boat ramp? (integer)

[If M3 = Shore] M6. Which shore site? (single choice)

- Port Geographe Beach
- Busselton Jetty
- Busselton Foreshore South
- Eagle Bay

Single choice options for M6 must list all sampling sites targeting shore base recreators.

[If M3 = Shore] M7. Approximately, how many people are at the shore site? (single choice)

- 0
- 1 - 25
- 26 - 50
- 51 - 75
- 100 +

Each single choice option in M7 can include an image of what each category looks like to aid the surveyor 's estimate.

M8. End time (date-time - see Fig A1.1)

M9. Comments\_\_\_\_\_ (free text - consider character limit)

When ending a shift, each surveyor must enter the end time (M8) to their metadata, so survey effort can be calculated. Surveyors can also add general comments (M9) about their shift (e.g., fishing competition).

# MPA recreational users' KAP survey template

## 1. Pre-survey

A pre-survey is used to collect survey metadata to enable calculation of response rates and to streamline data collection. This should be started as the target vessel is approaching the boat ramp or as the surveyor is approaching a potential respondent on the shore. A pre-survey should be completed for each attempted survey whether later refused or not.

Q1. Surveyor (single choice)

- Matt - UWA
- Nicole - UWA
- Joe - Undulap
- Other

[If Q1 = Other] Q1a. Other\_\_\_\_\_ (free text)

Single choice options in Q1 should include a list of every surveyor and institution. This is so the data can be checked for biases across individuals during analysis (e.g., add surveyor as a covariate in models to see if it has a significant impact on responses).

In question Q1a, surveyors should enter their name and institution consistently in all metadata and pre-surveys, to reduce post-collection data cleaning.

Q3. Are you currently at a boat ramp or shore site? (single choice)

- Ramp
- Shore

Q3 is used to determine whether recreators have done a boat based or shore based activity. Therefore, respondents are only eligible to do a “Ramp” survey if they have done a boat-based activity (i.e., do not survey someone jetty fishing off the boat ramp during “Ramp” surveys). Likewise, respondents are only eligible to conduct a “Shore” survey if they have done a shore based activity (i.e., do not survey someone retrieving a boat from a beach launch during “shore” surveys). Any beach launching or jetty fishing sites of interest should be listed in Q4 or Q5 respectively.

[If Q3 = Ramp] Q4. Which ramp? (single choice)

- Port Geographe
- Quindalup
- Dunsborough old
- Augusta

List each boat launching location (i.e., boat ramps or beach launching sites) in the sampling plan (see Appendix 4 for sampling plan details).

[If Q3 = Shore] Q5. Which shore site? (single choice)

- Port Geographe Beach
- Busselton Jetty
- Busselton Foreshore South
- Eagle Bay

List each shore site (i.e., beaches or jetties) in the sampling plan (see Appendix 4 for sampling plan details). Surveyors should be provided with reference maps for each site.

## Introduction & Screening

Prior to an interview a surveyor must determine if the respondent is eligible to be part of the survey. This takes place as part of normal conversation before the participant information and consent forms have been presented, whilst ensuring the time of ineligible respondents is not wasted.

The surveyor should introduce themselves and provide a short description of the project:

“I’m from [insert institution name]. We are collecting data for some research to better understand how people use and relate to marine management in the area.”

[If respondent appears < 25 years of age] Q6. Are you over 18? (single choice)

- Yes
- No [politely cease survey, with explanation]

We recommend screening for individuals over 18 years of age. This is to ensure that all respondents are able to provide sufficient consent without that of a parent or guardian.

Q7. Have you done a survey with [insert institution name] researchers about [insert research context e.g., marine management] in this area in the last [insert duration of sampling already occurred e.g., 6 months]? (single choice)

- Yes [politely cease survey, with explanation]
- No

We do not suggest collecting identifying information on respondents, therefore the collection of multiple responses from an individual must be avoided to prevent response bias.

## Participant information form

Formats for participant information forms (PIF) will vary between institution or human ethics review. However, to ensure informed consent given the on-site setting of these surveys we recommend the PIF be presented digitally (with paper copies available for those who request it), with researchers verbally describing key details:

“The survey is anonymous and will take approximately 8 minutes. All the questions in the survey are voluntary and you can withdraw at any time.”

A key priority in developing this field manual for MPA recreational users' KAP surveys is to ensure data are comparable and can be used across jurisdictions, institutions and campaigns. Whilst no discipline-specific repository exists for this data currently, we suggest researchers consider the possibility that they may like to publish data onto such a repository in the future. To allow this, respondents should be made aware of this in the PIF and it should be verbally described by the surveyor:

“Survey responses may be published on an online data repository to be available for other researchers to use for a range of appropriate purposes.”

Q8. Would you be willing to participate in this survey? (single choice)

- Yes
- No [politely cease survey]



Informed consent (Q8) is critical and must follow a description of the research, key details of the PIF and adhere to protocols outlined in the human ethics approval. There are several options for obtaining consent, but if permitted, it is optimal to obtain verbal consent with surveyors selecting “Yes” or “No” on the tablet to maximise survey efficiency. Alternatively, respondents can select “Yes” or “No” on the tablet. This is to prevent the use of paper consent forms, as signing paper consent forms can be challenging in windy coastal conditions. Regardless of informed consent method, refusals must be recorded to calculate response rate.

## 2. Practice

Practice in this survey refers to how individuals use a MPA (i.e., what activity they undertook where). The practice section is first in the survey, as asking about a person's day on the water is a great ice-breaker and helps develop rapport with the respondent.

Q9. What was the main activity that you did today? (single choice)

- Fishing
- Activity other than fishing

The main activity is the activity the respondent did for the longest at one site on that day.

After Q9, the survey flow splits depending on whether the individual was “Fishing” or conducting an “Activity other than fishing” to ensure questions are specific to the respondents activity.

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[If Q9 = Fishing]

### Practice: Fishing

Q10. What type of fishing? (single choice)

- Line fishing for demersals
- Line fishing for nearshore fish
- Line fishing for pelagic fish
- Line fishing for squid
- Spearfishing
- Cray loop (diving)
- Hand collection (diving e.g., abalone)
- Lobster potting
- Crab potting

Cast netting

During a fishing trip, fishers may have done multiple types of fishing. In this scenario the surveyor should only collect details for one fishing type, which was the main reason for choosing to go fishing that day or the fishing type they spent the longest doing throughout the day.

Single choice options for fishing activities should be customised to the local area and be detailed enough to differentiate key types of fishing activities. Similar fishing activities (e.g., potting) can be aggregated in analysis if necessary.

[If Q10 = Line fishing for... & Q3 = Ramp] Q10a. Were you trolling? (single choice)

- Yes
- No

[If Q10a = No] Q11a. Can you please point to where the activity took place on this map? - show map (spatial: point geometry)

Refer to Box 1: Capturing precise spatial data

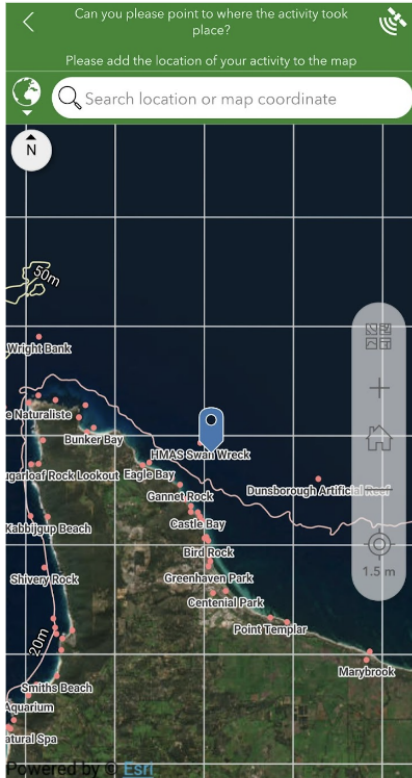
If a shore based respondent is mid-activity, use the default point on the map which indicates the precise location on the bluetooth connected GPS.

[If Q10a = Yes] Q11b. Can you please trace your trolling route on this map? - show map (spatial: line geometry)

Refer to Box 1: Capturing precise spatial use data

### Box 1: Capturing precise spatial data

Entering precise spatial use data is critical and facilitated by Survey123. We suggest developing informative maps and making them available offline as a mobile map package.



Maps should include:

- Satellite imagery of study site or detailed base map.
- Key locations and features (especially offshore features) which recreators may use to navigate (e.g., towns, coastal landmarks, beaches, shipwrecks, artificial reefs, channel markers). It is useful to consult marine navigational charts like Navionics to identify key features, particularly those fishers may target (e.g., rocks, shoals).
- Depth contours (we suggested 20m, 50m, 100m, 200m, 500m)
- Grid overlay of 5 x 5 km. This is very useful for entering precise locations as many respondents will use distance to describe or find their location.

When designing map layers it is important to consider that surveys may be conducted in bright sunny conditions, so it is useful to choose bold contrasting colours so layers are easily visible.

If the respondent is unsure of the exact location where they conducted their activity after examining the map, it can be useful to provide some prompts e.g., what direction did you go? how many kilometres offshore were you? what depth were you? were you near any islands?

Q12. Did you catch anything? (single choice)

- Yes
- No

[If Q12 = Yes] Q13. Did you keep anything? (single choice)

- Yes
- No

[If Q13 = Yes] Q13a. What species did you keep? (multiple-choice)

- Dhu fish
- Pink snapper (Pinky)
- Breaksea cod (Blackarse)
- Nannygai/Bight redfish (Nanny)

- Queen snapper (Queenie)
- Blue Groper
- Harlequin fish
- Swallowtail
- Foxfish
- Sergeant Baker
- Flathead
- Sea sweep
- Skippy/Silver Trevally
- King George Whiting
- Gummy shark
- Other
- Other
- Other

[If Q13a = Other] Q13b. Other \_\_\_\_\_ (free text)

Species list should be customised to the location and gear using local knowledge. For example, the list in Q13a corresponds to demersal fishing in the south-west of Australia. It is useful to display and use common and colloquial species names when surveying the general public (Survey123 label), but store data as scientific names (Survey123 name).

It can also be useful to have multiple options for “Other” in Q13a, which are followed up by multiple separate Q13b’s. This enables surveyors to capture multiple species which are not displayed in the species list.

▼ **Catch \***

What species did you keep?

- Dhu fish
- Pink Snapper /Pinky
- Breaksea Cod/Blackarse
- Nannygai/bight redfish
- Queen Snapper/Queenie
- Blue Grouper
- Harlequin

↓

Number of Breaksea Cod/Blackarse Kept? \*

Number of Queen Snapper/Queenie Kept? \*

[If Q13 = Yes] Q13c. How many [insert species name] did you keep? (integer)

Q13c is a follow-up question for each species selected in Q13a, and is used to capture the number of individuals kept of each species. See Fig A1.2.

Figure A1.2

[If Q12 = Yes] Repeat Q13, 13a, 13b and 13c for released fish where relevant

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[If Q9 = Activity other than fishing]

## Practice: Activity other than fishing

Q14. What activity did you do? (single choice)

- Beach going (relaxing on beach/beach day)
- Cruising (relaxing on moving boat)
- Relaxing on a boat (relaxing on a stationary boat)
- Swimming (not as part of a beach day)
- Snorkelling
- Diving (free diving or scuba diving)
- Row sport (Kayaking, Canoeing)
- Tow sport
- Wind sport (kite surfing, windsurfing)
- Sailing
- Surfing
- Stand-up paddle boarding
- Jet skiing
- Walking
- Dog walking

Q15a. Can you please point to where the activity took place on this map? (spatial: point geometry)

Refer to Box 1: Capturing precise spatial data

Q15b. Can you please trace your [insert mobile activity] route on this map?  
(spatial: line geometry)

Mobile activities include those which involve movement across large areas and cannot be accurately represented with a point: cruising, jet skiing, sailing, rowing sports.

Refer to Box 1: Capturing precise spatial data

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## Practice: General

The general practice section is applicable to all recreators whether they have been “Fishing” or done an “Activity other than fishing”.

Q16. When did you start the activity? (date-time - see Fig A1.1)

Q17. When did you stop the activity? (date-time - see Fig A1.1)

Surveys on site at shore locations can occur mid-activity, so surveyors should ask what time the respondent expects to stop their activity and select “Still at site” in Q18.

Q18. Why did you leave this site? (single choice)

- Still at site
- Weather conditions
- Change of activity
- Reached boat/bag limit
- Sharks taking too many fish/Too many sharks
- Wanted to explore somewhere else
- Stopped out of necessity (e.g., needed to get to work/appointment)
- End of day/had enough
- Other

[If Q18 = Other] Q18a. Other\_\_\_\_\_ (free text - consider character limit)

Surveyor to check off relevant responses mentioned by respondent - do not read out list of possible response options to respondent.

Q19. Did anything detract from the overall quality of your [insert recreational activity] today?  
(single choice)

- Yes
- No

[If Q19 = Yes] Q19a. What detracted from your experience? (multiple-choice)

- Marine debris
- Beach litter
- Coastal erosion
- 4WD/off-road vehicle impacts
- Discarded fishing tackle
- Too busy/crowded
- Dead wildlife
- Biohazards(oil/chemical spills)
- Safety concerns
- Bad facilities (lack of parking or amenities, poor boat launching facilities etc.)
- Bad conditions/weather
- Sharks taking too many fish/Too many sharks
- Environmental impacts (e.g., algal blooms, weeds, invasives)
- Not accessible/difficult to get to
- Didn't meet expectations
- Conflict with other users (same activity)
- Conflict with other users (different activity)
- Other

[If Q19a = Other] Q19b. Other \_\_\_\_\_ (free text - consider character limit)



Surveyor to check off relevant responses mentioned by respondent - do not read out list of possible response options to respondent.

Q19a has some overlap with Q18, as a feature may detract from the overall quality of an experience, but not necessarily be the reason they left their site.

### 3. Knowledge

[If Q9 = Activity other than fishing] Q20. Do you recreationally fish? (single choice)

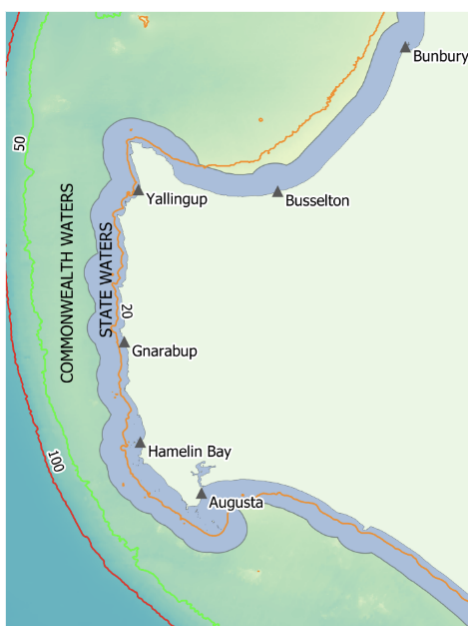
- Yes
- No

Need to understand fishing avidity to inform attitude questions.

[If Q20 = Yes or Q9 = Fishing] Q21. How many times have you been fishing in the last 12 months in any location? (integer)

Q22. Are you aware that in Australia, coastal waters out to around 5 km or 3 nautical miles are managed by the state government whilst offshore waters beyond that are managed by the Commonwealth? - show image (single choice)

- Yes
- No
- Unsure



Surveyors should present an image (not an interaction map) of study site map to the respondent. See example in Fig A1.3.

Image should include:

- Satellite imagery or detailed base map.
- Major towns
- Depth contours (we suggest 20m, 50m, 100m, 200m, 500m)
- Clearly demarcated state and Commonwealth waters

Figure A1.3

Q23. Are you aware of any marine parks in state waters in this area? (single choice)

- Yes
- No
- Unsure

[If Q23 = Yes or Unsure] Q24a. Are you able to name the state marine park you are thinking of? (multiple-choice)

- Ngari Capes MP
- A sanctuary zone name
- Geographe MP
- South-west Corner MP
- The Australian Marine Parks
- None of the above
- Not able to name

Surveyor to check off relevant responses mentioned by respondent - do not read out list of possible response options to respondent. This requires the surveyor to have some knowledge of MPA and zones names in the area. The correct answer in the example given is Ngari Capes MP.

Q25. Are you aware of any marine parks in Commonwealth waters in this area? (single choice)

- Yes
- No
- Unsure

[If Q25 = Yes or Unsure] Q25a. Are you able to name the marine park you are thinking of?

- Ngari Capes MP
- A sanctuary zone name
- Geographe MP
- South-west Corner MP
- The Australian Marine Parks
- None of the above

Not able to name

Surveyor to check off relevant responses mentioned by respondent - do not read out list of possible response options to respondent. This requires the surveyor to have some knowledge of MPA and zones names in the area. The correct answers in the example given are either the Geographe MP or South-west Corner MP.

#### No-take zone description

Several of the following questions are related to no-take zones which should be described to the respondent (e.g., areas where no fishing is allowed). It is also important to establish a term to use for discussing no-take zones the recreator will be familiar with, as this may vary (e.g., pink zones, green zones, sanctuary zones, national park zones). The familiar term established for discussing no-take zones must be used consistently throughout all questions relating to no-take zones to avoid confusion.

Q26. If I showed you a map, do you think you would be able to point to the location of the nearest [insert established no-take zone term]? (single choice)

- Yes
- No
- Unsure

[If Q26 = Yes or Unsure] Q26a. On this map, can you point to the location of the nearest [insert established no-take zone term]? (spatial: point geometry)

Refer to Box 1: Capturing precise spatial data

## 4. Attitudes

[If the study site contains MPAs in state waters] The next few questions are about the [insert established no-take zone term] in the Ngari Capes Marine Park in state waters - show image.



Surveyors should present an image (not an interaction map) of study site map to the respondent. See example in Fig A1.4.

Image should include:

- Satellite imagery or detailed base map of study site.
- Major towns
- Depth contours (we suggested 20m, 50m, 100m, 200m, 500m)
- Clearly demarcated state and Commonwealth waters
- No-take zones should be clearly displayed and match colours on local zoning maps.

Figure A1.4

[If Q9 = fishing or Q21 = yes] Q27. Looking at this map, how likely is it that you accidentally or intentionally fished in one of these [insert established no-take zone term] in the last 12 months? On a scale of 1 - “definitely not” through to 10 - “definitely”. (ranking - see Fig A1.5)

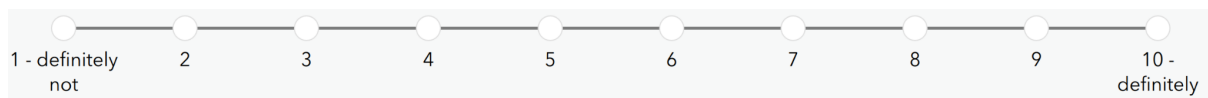


Fig A1.5. Example of how ranking questions are displayed in Survey123.

Q27 should be prefaced with a reminder of respondent anonymity. Formatting as a ranking question allows for a degree of agreement which can help with self reporting of undesirable behaviours.

Q28. Overall, are you opposed, neutral or supportive of the [insert established no-take zone term] in the Ngari Capes Marine Park? If opposed/supportive, would you say you are somewhat or strongly opposed/supportive? (likert/single choice)

- Strongly opposed
- Somewhat opposed
- Neutral
- Supportive
- Strongly supportive

Q29. The following questions relate to the effect you think the [insert established no-take zone term] in the Ngari Capes Marine Park have. For each of the questions please answer on a scale of strongly positive, somewhat positive, no effect, somewhat negative or strongly negative (matrix - see Fig A1.6)

- a. [Q9 = "Fishing" or Q21 = "Yes] What effect do you think these [insert established no-take zone term] have on your recreational fishing?
- b. What effect do you think these [insert established no-take zone term] have on non-fishing activities you do, like snorkelling or diving?
- c. What effect do you think these [insert established no-take zone term] have on the health of the marine environment?

	1. Strongly positive	2. Somewhat positive	3. No effect	4. Somewhat negative	5. Strongly negative
What effect do you think these Sanctuary Zones have on your recreational fishing?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
What effect do you think these Sanctuary Zones have on non fishing activities you do like snorkelling or diving?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
What effect do you think the sanctuary zones have on the health of the marine environment?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Fig A1.6. Example of how matrix questions are displayed in Survey123.

[If the study site contains MPAs in Commonwealth waters] Repeat Q27, 28 & 29 for no-take zones in Commonwealth waters

## 5. Demographics

Q33. Are you a local resident or visiting? (single choice)

- Resident (suggests single-day trip)
- Visiting (suggest multi-day trip)

Q34. What is your home postcode? (integer)

Please enter "0000" for international visitors.

Q34 is asked to every respondent whether they are a "Resident" or are "Visiting". This enables calculation of travel cost from each respondent's home postcode.

In Australia postcodes only contain digits, therefore integer is the most appropriate question type. However, in countries where postcodes also contain letters we suggest using a free text question with a constraint on characters (e.g., answer must contain 6 characters).

If "Visiting" recreators are international and do not have a postcode in the country, we suggest establishing a consistent protocol to capture international visitors. For Australia, we suggest "0000" - to guide surveyors this can be added as a hint in Survey123 and will appear in fine print under the question.

[If Q33 = Visiting] Q35. Where are you staying on your trip? (single choice)

Q35 is relevant to a visitor's accommodation and single choice options should include, major towns (no need to be more specific) and accommodation options outside of towns (e.g., campsites). This enables calculation of travel cost from visitor's accommodation.

[If Q33 = Visiting] Q36. How many days in total are you staying in the area? (integer)



[If Q33 = Visiting] Q37. Excluding this trip, how many separate trips have you taken to this area in the last 12 months? (single trip)

Q38. Would you say you have local knowledge of the fish and marine life of this area?

(single choice)

- Yes
- No
- Somewhat

Q39. What year were you born? (integer, constrained to 4 digits)

Q40. Are you of Aboriginal or Torres Strait Islander origin? (single choice)

- Yes
- No
- Both
- Prefer not to say

[If Q40 = Yes] Q40a. Are you a Traditional Owner of the region? (single choice)

- Yes
- No

If the local language group/s are known for the area, be specific to the language group and region e.g., Are you a [insert local language group] person of the [insert nation] nation?

[If Q40 = Yes] Q40b. Were the activities we discussed earlier conducted for a customary purpose? (single choice)

- Yes
- No

Q41. With which gender do you most identify? (single choice)

- Male
- Female
- Non binary
- Prefer not to say

[If Q3 = Ramp] Q42. Do you know the length of the boat you were using today? (integer)

Ask them for the boat length, however if they don't know, estimate the length.

Q43. Number of children in party (integer)

Consider children to be anyone less than 18 years of age.

Q44. Number of adults in party (integer)

Consider adults to be anyone more than 18 years of age.

Thank the respondent for their time and politely end the survey.