![Marine and Coastal - National Environmental Science Program]

RESEARCH REPORT

Evaluation of recreational fishing behaviour, use, values and motivations that relate to compliance

November 2023

We like to fish: characterising the recreational fishing population and designing messages to improve compliance

Tracey Mahony, Vanessa Adams, Matthew Navarro, Diane Jarvis, Francisco Gelves Gomez, Natalie Stoeckl, Swee-Hoon Chuah

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Acronyms

BOM	Bureau of meteorology
CPLPV	Click-per-landing-page-view
CPMR	Click-per-market-reach
CTA	Call-to-Action
CTLP	Click-through-to-landing-page
CTR	Click-through-rate
DR	Download rates
GBR	Great Barrier Reef
GBRMPA	Great Barrier Reef Marine Park Authority
GPS	Global positioning system
NESP	National Environmental Science Program (Australia)
NPS	Net Promoter Score
PCA	Principal Components Analysis
SEM	Structural equation modelling
SMBC	Social Marketing Benchmarking Criteria
STATA	Statistical and data software package
TPB	Theory of Planned Behaviour
ToC	Theory of Change
UM	UM Australia, Advertising & Marketing

Glossary

Call-to-Action (CTA)	A marketing term for a purposefully designed creative (an image and/or text, or audio message) that encourages the audience to act in a specific way. For example, to click through to a webpage, to sign up to a special offer or make a purchase.
Campaign types	Denotes the purpose and focus of the activities within the marketing campaign. There are many different types of campaigns. For example, in commercial marketing campaigns this may be to promote general awareness of a new product or service, or branding campaigns to provide a business with a certain image to the public. In this project we applied the social marketing benchmarking campaigns types which are suited to non-commercial settings and include (1) informing/encouraging, (2) educating/empowering (3) servicing / supporting, (4) designing / adjusting environment, and (5) controlling/regulating. Using this non-commercial categorisation of campaigns, GBRMPA have generally embarked upon categories (1) and (5). We have shown audience scope and demonstrated need to branch into other campaign types to address zoning compliance in recreational fishing.
Copy	In marketing this term refers to the written information used to inform, entertain, or entice an audience. In this project, the copy is the text of the actual message used in our A/B testing.
Copy focus	A marketing term to help organisations describe the need to write copy in a particular way. The copy focus connects the content of the copy and the tone of the copy. In this project our copy focus was informed by survey responses and focus group discussions that fishers across all types felt they needed information that was written in a simpler and easier to understand way, and that was positive towards them and their enjoyment of fishing.
Copy tone	A marketing term for how you 'sound' when writing. Writing copy (text messages) that audiences can relate to is an art form. Careful attention is needed to ensure that your tone is appropriate for the emotional response wanted from the audience.
Creative	In marketing terminology the creative refers to the entirety of all elements used to form the item of content. This includes the selections of any visual (images), copy (written text) and any sound or atmospheric choices used to convey the message.
Market segmentation	A marketing practice whereby a broad market is divided into smaller and easier to manage subgroups (market segments) based on a subset of demographic, psychographic or behavioural criteria. The purpose of market segmentation is to better understand your audience, and enable strategies to be developed to address their needs.

Mass marketing	A marketing practice where the organisation ignores differences in their market segments and only offers with the idea of broadcasting a single message to reach the largest number of people possible. This type of marketing can be a cost effective approach when paired with awareness type campaigns, for example, the existence of marine park zones to the general public. However, it is not as suited for targeting specific market segments.
Social Marketing Benchmarking Criteria (SMBC)	Social marketing benchmarking criteria were developed by Andreasen (2002) and further developed by the National Centre for Social Marketing (NCSM) to promote common elements that contribute to successful campaigns. These elements can be used as a good practice guide for managers when designing and implementing their campaigns. The elements are concepts to be integrated into the campaign and not promoted as checklist of items. The elements are summarised as:

(1) interventions are to change actual behaviour, not just knowledge attitude and beliefs. The aims of the campaign should conform to SMART principles

(2) should focus on fully understanding the lives of the audience and use a mix of data sources and research methods

(3) use behavioural theories to inform the intervention AND in analysing the results

(4) identify actionable insights

(5) considers the benefits and costs of adopting and maintaining a new behaviour and minimises the costs to create an attractive offer

(6) seeks to understand competitions on the audiences time, attention and inclination to behave in a particular way

(7) avoids one size fits all approaches and identified audience segments to tailor interventions

(8) uses a mix of methods to bring about behaviour change, and does not rely solely on raising awareness.

Valid Metrics Framework	The valid metrics framework has many variations in the literature and has been adapted for social media campaign use. This framework is designed as a tool to help managers to select and map the appropriate metrics for their campaign type in the designing their campaign strategy. The idea behind this approach is to promote best practice planning for organisations, by providing a clear line of sight between the organisational objective, implementation, evaluation and legacy of their marketing investment. The central question the valid metrics framework prompts managers to ask relates to:

- EXPOSURE – reaching our audience
- ENGAGEMENT- engaging our audience

- INFLUENCE - influencing our audience so they intend to adopt a particular behaviour.

- IMPACT - changing audience behaviour as desired

- ADVOCACY - observing the audience encouraging others to also act in a similar way.

Executive Summary

This report details a new evidence-based approach to public messaging to improve the compliance of recreational fishers with Australia's 'no take' marine conservation zones.

By investigating 'who' fishes, 'why' they fish, and 'what' their attitudes are to compliance, we identified three distinct 'types' of recreational fishers, differentiated by the extent to which they are likely to follow zoning laws. We found over half of Australian fishers support sustainable fishing practices, such as 'no take' zones, and another third have a neutral attitude (see pp. 15-32). **We partnered with the Great Barrier Reef Marine Park Authority to leverage this goodwill, developing and testing new bespoke campaigns** to engage fishers with positive messaging and to connect them to the information, apps and maps they need to locate and avoid 'no take zones - with promising results (see pp. 32-52).

Engaging Australia's recreational fishers in sustainable fishing practice is critical. Although the 'catch' or 'take' of individuals is small, the combined impact of the 4.2 million or so Australians who fish[1] is significant. In some areas, the intensity of recreational fishing can threaten target species or even local marine biodiversity. Total recreational fishing catches can also exceed those of commercial fishing in popular regions.

Alongside quotas, bag limits and other strategies, fishing 'zones' that tell fishers where they can and cannot fish play a vital role in the sustainable management of Australia's marine environments. However, 'no take' zones are challenging to monitor and enforce as fishers and fishing grounds are widely dispersed along the vast Australian coastline. And, while the extent of illegal recreational fishing is difficult to quantify, the number of offences reported is growing[2].

Who are Australia's recreational fishers?

Australians love to fish. To better understand the 18% of adult females and 25% of adult males who fish at least once a year, we partnered with Parks Australia and the Great Barrier Reef Marine Park Authority to develop and distribute questionnaires to collect information about fishers' characteristics, perceptions, motivations and attitudes (towards zoning and sustainable fishing practices). We followed up with focus groups to elicit personal stories. **We identified three types of fishers - differentiated by the extent to which they are likely to 'comply' with zoning laws:**

- **'Promoters' -** 52% of our sample. They enjoy fishing with children and extended families alongside other nature-based activities like camping and boating. Many promoters learnt to fish from family members. The best fishing trips are those when everyone has a good time. They are likely to promote sustainable fishing practices to others.
- **'Passives'** - 32% of our sample. They are unlikely to fish with children but are likely to fish with friends or older family members. Many live in metropolitan areas, travelling >80km to fish than other groups. Having a good time is important, but so too is catching fish. They may engage in behaviours like 'fishing the line' (harvesting the plentiful fish around the edges of marine reserves). They have a 'neutral or passive' attitude to sustainable fishing practices.
- **'Detractors'** - 16% of our sample. Their primary focus is maximising their catching fish, and they are likely to be dissatisfied with their fishing trips. They are also dissatisfied with the environmental management of their fisheries and are unlikely to encourage others to engage in sustainable fishing practices.

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[1] https://www.frdc.com.au/sites/default/files/products/2018-161-NRFS_main%20report_FINAL_19Feb2023.pdf
[2] https://elibrary.gbrmpa.gov.au/jspui/retrieve/a74d400b-9a9a-4704-8c49-c2652d5df8f4/Outlook-2019-FactSheet-Recreational-Fishing.pdf

Driving compliance to enhance conservation through behaviour change

Given the prohibitive cost of deploying compliance officers to monitor activities across Australia's vast marine estate, strategies to encourage fishers to comply with zones, of their own accord, are an essential part of the marine management mix.

Our research and pilot campaign demonstrated that bespoke messaging enables fishers to 'see themselves' in authentic 'stories and images that leverage the emotions connected to different aspects of fishing. By better 'personalising' the fishing experience and appealing to fishers' genuine good intentions, our pilot campaign achieved **greater engagement and better value for money,** than previous 'awareness' campaigns for mass audiences**.**

This report describes our research and provides guidance and key recommendations for end-users seeking to build relationships with recreational fishers and to support more fishers to self-comply with 'no take' marine conservation zones.

About our research methods

Our research focused on recreational fishers active in waters under the management of Great Barrier Reef Marine Park Authority (GBRMPA), with well-established 'no take' zones, and in the Geographe Bay Marine Park and Two Rocks Marine Park in Western Australia, where 'no take' zone have been implemented more recently. The diversity in locations, marine park longevity, and in fishers' familiarity with 'no take' zones was important to ensure our results can be generalised to inform future compliance campaigns Australia-wide.

We distributed over 800 online questionnaires to fishers in Queensland and the southern WA and followed up with focus groups and analysed data using a variety of statistical methods (non-parametric tests, clustering analysis, and structural equation modelling). As our primary aim was to find new ways to encourage compliance, we needed to better understand how demographics, fishing patterns and motivations, and other factors, related to an individual or groups' intentions to comply with 'no take' zones.

It is difficult, if not impossible, to measure intentions to fish illegally, or to accurately quantify illegal fishing. We needed a proxy. Here we applied the Net Promoter Score (NPS), a concept common to consumer research, to predict the behaviours of individuals, and to identify fishers' behavioural intentions towards sustainable fishing practices, such as 'no take' zones. Using the resulting NPS scores we grouped our respondents into 'Promoters' of sustainable fishing, 'Passives' (neutral) and 'Detractors'. We were then able to broadly describe the characteristics and motivations of each group and learn more about core drivers of their behaviour, needs and values, and how to build positive relationships with them. This laid the foundations for new recommendations to guide the development of 'bespoke' compliance campaigns, taken up and piloted by the Great Barrier Reef Marine Park Authority in May/June 2023 (See case study, pg. 37+).

Piloting bespoke messaging with the Great Barrier Reef Marine Park Authority (GBRMPA)

The key aim of the pilot campaign was to help GBRMPA build positive relationships with recreational fishers. This engagement would, in turn, enable the GBRMPA to reinforce or enhance positive attitudes to compliance among the recreational fishing community, by:

1. Emphasising the positive role 'no take' zones play in securing fishing stocks and a sustainable 'fishing lifestyle' into the future **('fish for their future', 'love the reef')**
2. By providing fishers with the information, apps and maps they need to locate and avoid 'no take zones **('fish the right zone')**

Campaign approach: New targeted messages and 'creatives' for a diverse fishing community, represented in the pilot campaign by images of families and friends. The campaign departed from previous GBRMPA campaigns (single set of campaign resources, predominantly male target audience) that used general 'awareness' messages highlighting zoning and fines. The campaign did not seek to target 'Detractors' of compliance with fishing zones.

Campaign type/timing: Social media campaigns, May/June 2023

Target audience: A review of previous recreational fisher literature and GBRMPA campaigns identified fishers as 18- to 64-year-old males. From our survey, results re-recommended widening the view of who fishers are in the campaign scope. For the pilot, we targeted males and females 18-54 in Queensland locations, with contextual targeting (serving content to those interested in fishing, boating etc).

Campaign platforms: We placed campaign content as banner, meta, and YouTube ads.

Recommendations and example creatives taken up by GBRMPA for the pilot targeting family groups were:

- *Campaign type* - educational and relationship building.
- *Creative* - Imagery capturing **a sense of quality time as a family on the water.**
- *Copy focus* - supportive, non-judgmental messaging, highlighting the value of 'no take' zones in maintaining fish stocks and securing the 'fishing lifestyle'.
- *Key messages tested* - the existing **'fish the right zone'** and the new **'fish for their future'**.
- *Copy tone* - positive framing, simple text.
- *CTA* - 'Get free maps, app, and more at gbrmpa.gov.au', providing access to one stop information sources.

Recommendations and example creatives taken up by GBRMPA for the pilot targets groups of friends were:

- *Campaign type* - educational and relationship building.
- *Creative* – Imagery capturing **the sense of enjoyment and fun from a day together while fishing.**
- *Copy focus* - supportive and non-judgmental, education and information resources to enable compliance.
- *Key messages tested* - the existing **'fish the right zone'** and the new **'love the reef'**.
- *Copy tone* - positive framing, simple text.
- *CTA* - 'Get free maps, app, and more at gbrmpa.gov.au', providing access to one stop information sources.

Additional recommendations, levering insights about 'Detractors' of 'no take' zones

Detractors are unlikely to engage with messaging from marine management authorities. They are more likely to respond to peers, especially through fishing clubs. This means managers need to build long term relationships, possibly through their identified tendency to be members of clubs. Where the source of detractors' beliefs are science based uncertainties, another approach may be to demonstrate that more and bigger fish are available in marine parks with effective 'no take' zones and linking compliance with securing future fishing opportunities. Connecting with Detractors was not an objective of the GBRMPA pilot campaign.

Results:

The campaign reached the right audience with the right imagery and calls to action. The new targeted text and images (creatives) resonated with a broad demographic of recreational fishers, driving click throughs to GBRMPA resources pages and good/excellent engagement with available tools/resources. *Facebook* and *YouTube* were relevant platforms for GBRMPA's target audience. The inclusion of female fishers extended the campaign's reach. **Key findings include**:

- Overwhelmingly positive comments/feedback related to *Facebook* ads, with users 'seeing' themselves or friends in the posts and tagging others in, positively amplifying the message.

- Click through rates from *Facebook* to the GBRMPA resources page exceeding past campaigns.

- Excellent retention rates on the GBRMPA resources page (up to 90% for our best performing 'Family' creative).

- A five-fold improvement in the cost efficiency of reaching GBRMPA's target audience, compared to past campaigns.

*For a detailed account of the pilot campaign and full results, see pp. 32-52

What role for compliance officers in bespoke messaging?

Compliance is driven by actual consequences, like fines, and also by the fishers' perceived risk of being caught. Including information about fines in messaging is one approach. However, participants in our studies emphasised there was currently a low perceived risk of being caught. They were interested in seeing a greater physical presence of compliance officers, and in being given the opportunity to interact with officers on the water and at land-based community events.

Recommendations: **Use both messaging and physical activities to enhance the visibility of compliance officers wearing recognisable uniforms**. This includes the presence of compliance officers at popular fishing spots and community events to build relationships, as well as featuring compliance officers' stories in the traditional and online media.

1 Overview

We undertook background research, to develop general recommendations on **messaging to improve compliance** and partnered with the GBRMPA to test some of those messages in a 'live' campaign[3].

Background research
We used insights from behavioural sciences, to develop a questionnaire to 'profile' different types of fishers – according to the extent to which they are likely to 'comply' with zoning laws. Information from the questionnaire was analysed using a variety of statistical methods, to answer the following questions:

1) Do fishers' attitudes, norms and perceptions about fishing regulations correlate with their intentions to promote sustainable fishing practices, such as compliance with 'no take' zones? If so, in what way?

2) Are there statistically discernible differences in the above relationships between fishers in different regions?

3) Are behavioural intentions correlated with other variables that can be leveraged to promote more sustainable fishing practices?

We used insights from the quantitative analysis to inform the development of questions for focus group discussions, that provided supplementary qualitative information about fishers.

Development and testing of messaging recommendations
We leveraged insights from the behavioural sciences, our quantitative and qualitative analyses to developing messaging recommendations to *enhance compliance.*

A subset of these recommendations was taken up by the Great Barrier Reef Marine Park Authority (GBRMPA) and used within *campaigns* run during May and June 2023.   We used a range of metrics to assess the effectiveness of the campaign focussing particularly on metrics related to the new messaging strategies.

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[3] See Appendix A: The 9 step model for behaviour change research for details of general approach and the theory supporting it.

2   Background research to develop recommendations

2.1   Methods

2.1.1   A questionnaire to measure fisher characteristics and compliance attitudes

2.1.1.1   Overview, design, and intent

Recreational fishers are commonly categorised based on their compliance behaviour using the regulatory compliance pyramid (Braithwaite 2002)[4] – a model used by the GBRMPA (Figure 1) to guide the development of compliance strategies. We used this model to frame our thinking about ways to characterise compliance behaviour in the questionnaire (formally measured using *the net promoters score* – see section 2.1.1.2). We then used insights from behavioural sciences to develop questions linked to the core constructs from the Theory of Planned Behaviour[5] (section 2.1.1.3). This theory connects actual behaviours (compliance with 'no take' zones) to intended behaviours (ideally, the intention to comply) and to an array of important determinants of actual and intended behaviours.

Our questionnaire was designed to capture the rich mix of information required to answer our research questions. We needed to explore how fishers' intentions to promote (or ignore) sustainable fishing behaviours, including compliance with 'no take' zones, is influenced by their attitudes, subjective norms (their belief that certain behaviours are supported by influential people around them) and perceived behavioural controls (how easy or difficult the person perceives complying with regulations to be). Appendix F: Survey questionnaire - provides a complete list of questions used.

2.1.1.2   Developing measures of compliance – Net promoter scores

Identifying and measuring whether an individual engages in illegal activities is difficult. In some cases, protecting the anonymity of sources can elicit useful information. Alternatively, quantifying the volume of resources disappearing from a protected area against a known baseline, can indicate illegal activity, and its extent. For Australian marine conservation zones, there is insufficient data relating to the behaviour of recreational fishers to measure compliance – e.g., to know how many fishers do not fish in the right zones. Likewise, asking recreational fishers if they intend to break the law in 'no take' zones, or if they did break the law, it is unlikely to elicit truthful responses.

To overcome this challenge, we asked fishers a related question: how likely they were to recommend sustainable fishing practices to family, friends and other recreational fishers? We worked with the *net promotor score (NPS)* – a concept that has been used to predict the behaviour of customers in both the private and not-for profit (e.g., health) sectors (Reichheld & Markey 2006; Baehre et al. 2022; Lucero 2022). The responses were recorded on a 10-point scale and classified into three distinct **NPS categories**: detractors (responses 0 to 6), passives (responses 7 - 8), and promoters (responses 9 – 10).

Matching the NPS categories to different parts of the compliance triangle used by the GBRMPA (Figure 1) provided us with our proxy measure for behavioural intention. No direct measure of actual behaviour was used in this study – which is normal practice in studies of this type.

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[4] See Appendix B: The Braithwaite Model for a more detailed discussion.
[5] See Appendix C: Social Cognitive Behaviour and The Theory of Planned Behaviour for more detail.
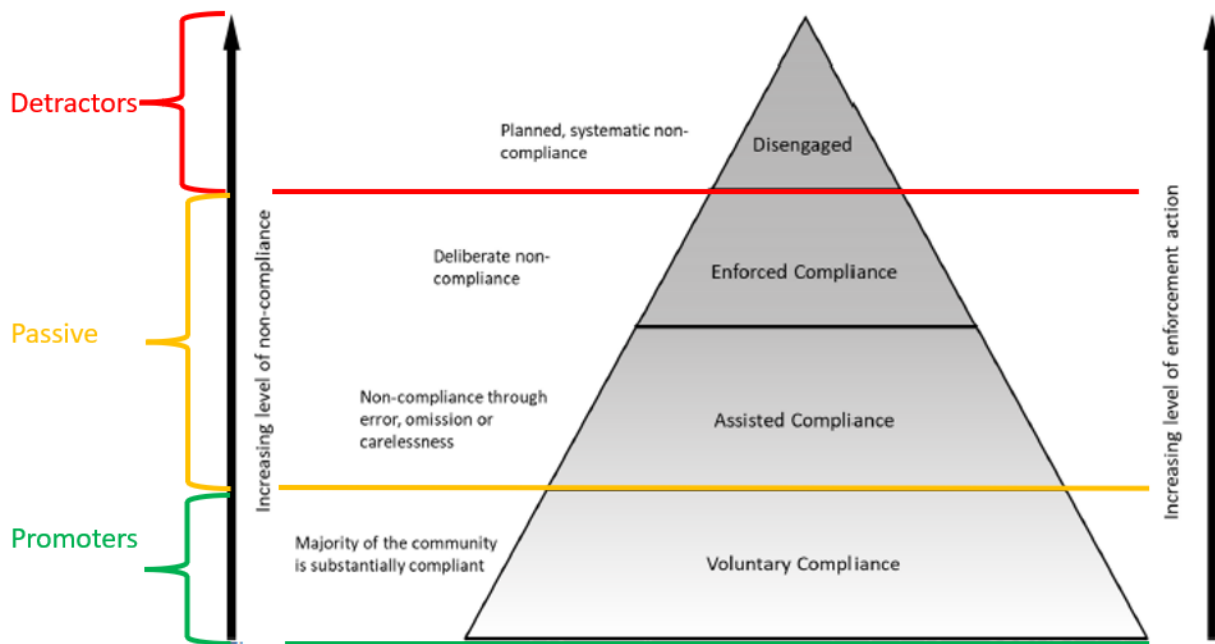
Figure 1. Relationship between three categories of Net Promotor score (left) and The Braithwaite regulatory compliance model (right) Adapted from GBRMPA compliance draft policy

2.1.1.3 Developing measures of factors likely to be associated with compliance

Additional survey questions were developed to align with an expanded model of the theory of planned behaviour (Ajzen 1991), that leverages insights from the theory of change[6] created for this project – ensuing all questionnaire content was tailored to the case study context, (See Figure 2). Appendix F has a copy of the survey. The questions capture information about the various individual attributes of recreational fishers, regionally relevant environmental factors that influence behaviour, as well as aspects of attitudes, norms, and perceived behavioural controls.
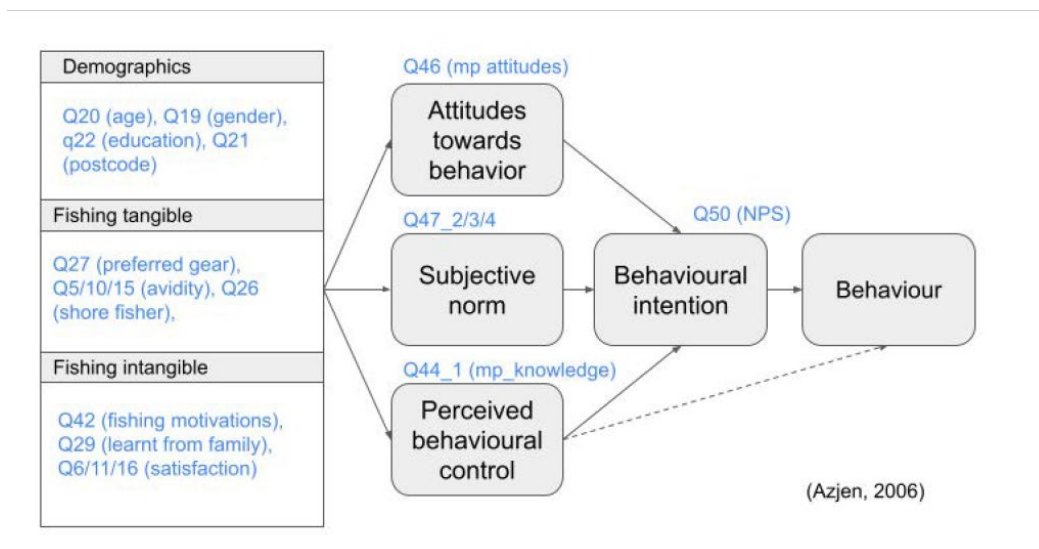
Figure 2. Core drivers of behaviour, used to guide development of questionnaire (from the expanded theory of planned behaviour, Ajzen, 1991)

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[6] See - Appendix D: The Theory of Change.

2.1.2 Data collection

2.1.2.1 Questionnaire / Survey

Of all possible recruitment methods available for surveying recreational fishers (Moore et al. 2023), we found online panel data from a market research agency was least likely to be biased and was judged to be most representative. We chose to collect our data from a panel. We used screening questions to ensure the panel comprised a representative sample of individuals who had fished in the Great Barrier Reef Marine Park, Two Rocks Marine Park and Geographe Marine Park in the last 12 months. Quota minimums were established to obtain responses from 400 individuals for the Great Barrier Reef Marine Park case study, 200 from the Two Rocks Marine Park case study and 200 from the Geographe Bay Marine Park case study. Within the Great Barrier Reef Marine Park case study, further quotas were used to obtain ~300 respondents from the Great Barrier Reef catchment area, and 100 from South-East Queensland. Small incentives we used by the agency for survey completion[7] and the commissioning research team also provided (a prize draw for 4 x $50 vouchers). The survey was approved by the JCU Ethics (Ethics approval H8881) and launched via a third-party panel data collector in October 2022. A total of 821 valid responses that met our quality criteria were received by November 2022.

2.1.2.2 Focus groups

After collecting the survey data, we ran an online focus group with eight participants – drawn from a subset of respondents to the online survey, who (after having completed the questionnaire) had indicated a willingness to participate. The focus group discussions were framed around a series of activities / questions, intended to hear 'stories' and thus gather rich qualitative data to help contextualise insights drawn from the quantitative analysis of survey data.

The focus groups were NOT intended to be our primary source of data, rather to provide supplementary context. The focus group intentionally included a wide diversity of respondents to elicit a wide range of views. However, future research on larger projects than this pilot, should seek to explore these issues further.

Briefly, after introductions, participants were guided through a series of unstructured discussions, framed around the following:

1) What do you like/love most about fishing? What would make your trip more enjoyable?

2) What does one of your typical fishing trips 'look like'? Specifically, who do you fish with? When do you start planning? What, if anything, do you prepare in advance? How do you decide where to go?

3) Do you think you – and future generations – will be able to enjoy going on the types of fishing trips that you enjoy? If not, how do you think the trips will change (how will they be different)? What could be done to better safe-guard fishing as an enjoyable recreational activity for yourself and future generations?

A summary of the Focus Group Discussion format used to guide discussions can be found at Appendix G.

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[7] The researchers do not have any control over or knowledge of the panel organisers incentive distribution.

2.1.3   Data Analysis

2.1.3.1   Quantitative analysis of survey data

We used descriptive statistics, correlation analysis, non-parametric tests, principal components analysis (PCA) and structural equation modelling (SEM). Descriptives were used to first understand the data and provide an overview of respondent characteristics. Correlation analysis was used to explore simple relationships between NPS scores; non-parametric tests were used to formally test for difference between the characteristics and attitudes of fishers who fell into each of the three NPS categories (Promoters, Passives, Detractors). **This analysis suggested that fishers within different NPS categories have different characteristics.**

PCA was used to develop a single measure of social norms – effectively combining responses to multiple questions into a single variable. This was used within a Structural Equation model (SEM). The SEM was used with the STATA statistical software, to analyse the entire 'system', because it allows researchers to explicitly allow for interrelationships and interdependencies between variables. This allowed us to investigate associations between all variables, following the 'structure' adopted from the Theory of Planned Behaviour (TPB, Figure 2). This is important because the TPB suggests that external variables like age do not affect compliance behaviours directly (measured here using NPS category). Instead, age affects the mediators of behaviours including attitudes towards the behaviour, social norms and perceived behavioural control (Figure 2). SEM's allow us to explore this complexity for multiple fisher attributes simultaneously.

For each attribute, we explored their effect on NPS, decomposing its effect based on whether it is mediated by attitudes, social norms and/or perceived behavioural controls. We also include the total effect of the attribute on NPS which reflects the sum of the three mediated effects. This partitioning of effects was performed using the 'delta method' for non-linear combinations of parameters. For comparability, effect sizes of continuous variables are scaled so they represent the effect of one standard deviation in the independent variable. A Likert-type scale was used to identify attitudes to, and knowledge of, marine parks and modelled using ordinal regression. The continuous social norm PCA scores were modelled using ordinary linear regression. Estimation was performed using full information maximum likelihood.

2.1.3.2   Qualitative analysis from focus groups

We worked through responses to the discussion questions to develop some 'stories' about motivations and types of fishing trips. We considered the general characteristics of each trip, comments that provided hints about the emotions they were feeling when making decisions (relevant to *nudging,* see Appendix E: Nudging), comments about technologies adopted during the fishing trip (informing ideas around ways to 'reach' core groups), and comments relating to compliance (theirs, other people's and or ideas for the future).

2.2 Results

2.2.1 Overview

Our questionnaire was designed to capture the rich mix of information needed to answer specific questions. Our analysis revealed the following:

1) Do fisher attitudes, norms and perceptions about fishing regulations correlate with intentions to promote sustainable fishing practices? If so, in what way?

   Yes. Positive behavioural intentions were associated with positive attitudes towards no take zones, positive social norms and greater knowledge of no take zones. Much of the variation in compliance behavioural intentions was explained by external variables, and particularly motivations for fishing.

2) Are there statistically discernible differences in the above relationships between fishers in different regions?

   In general, no. Our cross-continental study suggests that recreational fishers' attitudes, social norms and perceived behavioural controls have similar effects on compliance behavioural intentions across the Great Barrier Reef Marine Park, Geographe Marine Park and Two Rocks Marine Park.

3) Are behavioural intentions correlated with other variables that can be leveraged to promote more sustainable fishing practices?

   Yes. Clearly, not everyone fits into the same 'box', but our analysis revealed that there were statistically significant differences between the characteristic, attitudes and motivations of fishers who were matched to different NPS categories. Briefly:

   - **'Promoters' -** 52% of our sample. They enjoy fishing with children and extended families alongside other nature-based activities like camping and boating. Most learnt to fish from family members. The best fishing trips are those where everyone has a good time. They are likely to promote sustainable fishing practices to others.

   - **'Passives'** - 32% of our sample. They are unlikely to fish with children, but are likely to fish with friends or older family members. Many live in metropolitan areas, travelling >80km to fish than other groups. Having a good time is important, but so too is catching fish. They may engage in behaviours like 'fishing the line' (harvesting the plentiful fish around the edges of marine reserves). They have a 'neutral or passive' attitude to sustainable fishing practices.

   - **'Detractors'** - 16% of our sample. They are more focused on catching fish than the others, and much more likely to be dissatisfied with their fishing trip. They are also generally dissatisfied with the environmental management of their fisheries and are unlikely to encourage others to engage in sustainable fishing practices.

We were able to use insights from this analysis to develop messaging strategies to better leverage the values, norms, attitudes and behavioural intentions of promoters. Some of the borderline passives may also respond well to this messaging; although we note the need to consider other strategies for detractors.

2.2.2 Describing the sample

Across our survey of 821 recreational fishers in Queensland and Western Australia our sample was 41% male, 59% female; median age 26-41 years old, 8% ATSI, and are largely multi-generational. For example,

- 85% of respondents reported being taught to fish by other family members,
- 12% most often fish with children under 18 years,
- 13% were 18-25 years (Gen Z), 46% 26-41 years (Millennials), 28% 42-57 years (Gen X), 13% 58 to 67 years (Boomers I), >1% over 77 years (Boomers II & Post War).

Blending insights from multiple sources, it is possible to infer that, approximately 42% of Australian recreational fishers are female. Our survey sample comprised 59% females, so gives particularly good insights on attitudes of an important part of the fishing population which is often under-represented in other samples and sampling approaches.

2.2.3 Characteristics of fishers matched to Net Promoter Scores

Noted earlier, responses to our question about likelihood of promoting sustainable fishing practices were recorded on a 10-point scale and classified following the NPS approach into detractors (responses 0 to 6), passives (responses 7 - 8), and promoters (responses 9 – 10). These NPS classifications correspond to different parts of the compliance triangle used by the GBRMPA (Figure 1) and serve as our proxy measure for behavioural intention.

Importantly these three groups can be roughly matched to other characteristics, such as what makes for a good fishing trip for them (motivations), whether they are likely to join fishing clubs, what television shows they watch, and which social media platforms they use most frequently. They are, therefore, well-defined, and distinct segments. We describe responses to core questions for each group and used various non-parametric tests to check for the statistical significance of observed differences (See Table 1 best read in conjunction with the questions that were used - see Appendix F: Survey questionnaire).

Table 1: Sociodemographic, attitudinal, motivational and other characteristics, by NPS category (Detractor, Passive, Promoter)

Fisher characteristic	Chi squared	Kruskal-Wallis H	Detractor (N=136)	Passive (N=258)	Promoter (N=420)
		Are there statistically significant differences in responses across groups? (at 5%)		**NPS Category**	
Lives in QLD (GBR case study) - %	Yes	Detractors are more likely to live in QLD	60.3%	45.0%	54.0%
Live within 80km of marine park - %		Passives less likely to live 'locally'	60.3%	53.1%	66.2%
Female %	No	No	53.7%	54.3%	59.8%
Aboriginal or Torres Strait Islander %	Yes	Detractors higher % Indigenous	16.2%	4.7%	4.3%
Age - % SINGLE RESPONSE	Yes	Yes			
18-25 years			19.1%	19.4%	9.5%
26-41 years			42.6%	45.0%	46.7%
42-57 years		Promoters generally older than others	30.9%	24.0%	25.7%
58-67 years			7.4%	8.9%	12.4%
68-76 years			0%	2.3%	5.2%
77+ years			0%	0.4%	0.5%
Highest Education - % SINGLE RESPONSE	Borderline (6%)	No			
Yr 10			11.0%	6.6%	9.0%
Yr 12			23.5%	18.6%	20.5%
Trade or equiv			22.8%	30.2%	33.3%
UG University			30.9%	29.8%	20.7%
PG University			11.8%	14.3%	15.2%
Remoteness % SINGLE RESPONSE (from postcode)	Yes	Yes			
Lives in major city			48.5%	61.6%	44.3%
Lives in inner regional area			14.7%	17.4%	18.1%
Lives in Outer regional area		Passives more likely to live in major city than others	32.4%	18.2%	31.9%
Lives in remote area			2.9%	0.8%	3.8%
Lives in very remote area			1.5%	1.9%	1.9%
Frequency of fishing - % SINGLE RESPONSE	Yes	No			
Every 1-4 days			44.9%	39.9%	38.6%
Every 5-14 days			41.1%	37.6%	37.6%
Every 15 – 30 days			13.2%	17.4%	14.9%
Every 31-90 days			5.0%	6.0%	6.5%
Not more than once every 90 days			0.8%	0.5%	1.0%

| Fisher characteristic | Are there statistically significant differences in responses across groups? (at 5%) | | NPS Category | | |
	Chi squared	Kruskal-Wallis H	Detractor (N=136)	Passive (N=258)	Promoter (N=420)
Satisfaction with quantity of fish SINGLE RESPONSE	Yes	Yes			
Extremely dissatisfied			7.4%	2.3%	3.6%
Somewhat dissatisfied			20.6%	15.5%	24.0%
Neutral		Detractors less satisfied than others	30.9%	27.1%	17.9%
Somewhat satisfied			39.0%	49.2%	41.7%
Extremely satisfied			2.2%	5.8%	12.9%
Satisfaction with quality of fish SINGLE RESPONSE	Yes	Yes			
Extremely dissatisfied			5.1%	1.6%	2.4%
Somewhat dissatisfied		Detractors less satisfied than Passives who are less satisfied than Promoters	19.9%	11.6%	16.2%
Neutral			28.7%	21.7%	15.7%
Somewhat satisfied			41.9%	60.9%	47.4%
Extremely satisfied			4.4%	4.3%	18.3%
Satisfaction with environmental management SINGLE RESPONSE	Yes	Yes			
Extremely dissatisfied			3.7%	0.8%	2.4%
Somewhat dissatisfied		Detractors less satisfied than others	16.2%	10.1%	13.6%
Neutral			36.8%	29.8%	24.3%
Somewhat satisfied			39.0%	51.6%	41.4%
Extremely satisfied			4.4%	7.8%	18.3%
Living expenses have decreased the number of trips I take SINGLE RESPONSE	Yes	Yes			
Strongly disagree			3.7%	3.9%	5.7%
Disagree		Detractors fewer reductions than Passives who have fewer reductions than Promoters	17.6%	10.9%	12.1%
Neutral			33.8%	23.3%	14.0%
Agree			33.8%	52.3%	45.5%
Strongly agree			11.0%	9.7%	22.6%

| Fisher characteristic | Are there statistically significant differences in responses across groups? (at 5%) | | NPS Category | | |
	Chi squared	Kruskal-Wallis H	Detractor (N=136)	Passive (N=258)	Promoter (N=420)
Living expenses have decreased the number of fish I catch and release as I take more home to eat SINGLE RESPONSE	Yes	Yes			
Strongly disagree		Detractors fewer reductions than others	2.9%	5.4%	12.4%
Disagree			20.6%	22.5%	26.2%
Neutral			45.6%	33.7%	32.4%
Agree			25.0%	34.1%	22.6%
Strongly agree			5.9%	4.3%	6.4%
Living expenses have decreased how far I travel to go fishing SINGLE RESPONSE	Yes	Yes			
Strongly disagree		Detractors fewer reductions than Passives who have fewer reductions than Promoters	7.4%	3.5%	4.3%
Disagree			9.6%	10.9%	10.5%
Neutral			32.4%	21.3%	11.5%
Agree			38.2%	53.9%	47.7%
Strongly agree			12.5%	10.5%	26.0%
Living expenses have meant I go without other things to afford fishing SINGLE RESPONSE	Borderline (5.5%)	Yes			
Strongly disagree			12.5%	11.6%	19.3%
Disagree			23.5%	24.4%	27.9%
Neutral		Detractors fewer reductions than others	35.3%	33.3%	24.8%
Agree			22.1%	25.6%	23.1%
Strongly agree			6.6%	5.0%	5.0%
Since Covid. I go saltwater fishing SINGLE RESPONSE	Yes	No			
A lot less			11.8%	9.3%	10.7%
A little less			22.8%	28.3%	28.6%
About the same			56.6%	45.0%	45.0%
More often			8.1%	17.1%	12.6%
A lot more often			0.7%	0.4%	3.1%

| Fisher characteristic | Are there statistically significant differences in responses across groups? (at 5%) | | NPS Category | | |
	Chi squared	Kruskal-Wallis H	Detractor (N=136)	Passive (N=258)	Promoter (N=420)
How do you mostly go saltwater fishing? SINGLE RESPONSE	No	No			
I mostly fish from my own boat			21.3%	19.8%	19.0%
I mostly fish on other people's boats			24.3%	24.8%	22.4%
I mostly fish from the shore			34.6%	32.9%	41.4%
I fish from a boat and from the shore roughly the same			19.9%	22.5%	17.1%
% who have used different types of gear MULTIPLE RESPONSE					
Trolling	Borderline (10%)	At 8%	25.7%	18.6%	17.1%
Line fishing other than trolling	No	No	86.8%	84.1%	89.3%
Crab pots or scoop	Yes	Passives < others	33.1%	19.4%	31.7%
Hand capture (e.g., for crayfish)	Borderline (10%)	At 8%	20.6%	14.0%	12.9%
Other (Please specify)			1.5%	0.4%	1.7%
MAIN type of gear used SINGLE RESPONSE	Yes	No			
Trolling			16.2%	9.3%	6.2%
Line fishing other than trolling			71.3%	76.7%	85.2%
Crab pots or scoop			5.1%	4.7%	4.3%
Hand capture (e.g., for crayfish)			2.9%	3.1%	1.2%
Spearfishing			4.4%	5.8%	2.4%
Other (Please specify)			0.0%	0.4%	0.7%
Learnt fishing from family	Yes	Yes – Detractors less likely to have learnt from family	75.0%	82.2%	84.8%
Who do you usually go saltwater fishing with? MULTIPLE RESPONSE					
Friends		No	50.7%	50.0%	52.9%
Family - adults		No	46.3%	53.9%	55.2%
Family - children under 18 years	Yes	Detractors less likely than others; Passives slightly less likely than Promoters	16.9%	22.1%	28.8%
Fishing club members		No	3.7%	2.7%	3.1%
I prefer to fish alone		No	9.6%	8.1%	7.4%

| Fisher characteristic | Are there statistically significant differences in responses across groups? (at 5%) | | NPS Category | | |
	Chi squared	Kruskal-Wallis H	Detractor (N=136)	Passive (N=258)	Promoter (N=420)
Club membership (SINGLE REESPONSE)	Yes	Yes			
Fishing club		Detractors more likely to be members of fishing club; Promoters more likely to not belong to any club	21.3%	9.3%	9.8%
Other club			11.8%	7.4%	7.6%
No clubs			56.6%	66.3%	72.9%
Social media - % using different platforms MULTIPLE RESPONSE					
You tube	Yes	Yes. Promoters less likely to share on You-Tube	25.0%	21.7%	11.9%
Facebook			39.0%	45.3%	47.4%
Instagram			19.1%	28.7%	24.5%
Linked in			1.5%	3.5%	2.6%
Whats up			6.6%	4.7%	6.7%
Tik Tok			6.6%	8.9%	6.2%
Fishing Shows - % watching MULTIPLE RESPONSE					
Fishing Australia	Borderline (10%)	Borderline (10%) Detractors and Passives the same; Promoters less likely to watch	30.1%	28.3%	22.4%
FN Fishing show			5.1%	1.9%	3.6%
Creek to Coast	Yes	Promoters more likely to watch than others	14.0%	18.2%	28.3%
Hook Line Sinker			14.0%	16.3%	16.7%
About Fishing	Yes	Passives more likely to watch than Promoters	4.4%	8.1%	3.8%
Gone Fishing			11.0%	15.5%	11.0%
Fish Flicks			3.7%	2.7%	1.4%
Do not watch fishing shows	Yes	Detractors less likely to watch any fishing show than othes	34.6%	26.4%	23.8%

| Fisher characteristic | Are there statistically significant differences in responses across groups? (at 5%) | | NPS Category | | |
	Chi squared	Kruskal-Wallis H	Detractor (N=136)	Passive (N=258)	Promoter (N=420)
Brands - % with a favourite brand of .. MULTIPLE RESPONSE					
Fishing Clothing	No	No	58.8%	61.2%	60.7%
Fishing Gear	No	No	51.5%	55.4%	56.4%
Hobbies other than fishing .. MULTIPLE RESPONSE					
Boating	Yes	Detractors less likely to do boating (without fishing)			
Snorkelling			25.0%	34.1%	33.8%
Suba Diving			12.5%	13.6%	11.7%
Water Skiing			13.2%	8.5%	9.8%
Team Sports			14.0%	19.8%	19.5%
Running	Borderline (10%)	Passives more likely to be runners (8%)	22.8%	25.2%	18.1%
Sky diving			7.4%	5.0%	3.8%
Reading			30.1%	37.2%	39.8%
Photography	Yes	Yes	16.9%	26.7%	29.8%
Horse riding			8.1%	5.4%	7.1%
Camping, bushwalking, being outdoors	Yes	Yes – promoters more likely to do other outdoors	45.6%	48.4%	61.7%
Preferred Pet (SINGLE REESPONSE)		No			
Cat			16.9%	19.0%	14.0%
Dog			65.4%	66.7%	67.6%
Birds			2.2%	1.6%	2.6%
Aquarium fish			4.4%	1.9%	5.5%
Horse			2.2%	1.6%	1.0%
Reptiles			0.7%	1.2%	0.7%
Other			0.0%	1.2%	1.4%
None; would rather not own a pet			8.1%	7.0%	7.1%

Fisher characteristic	Are there statistically significant differences in responses across groups? (at 5%)		NPS Category		
	Chi squared	Kruskal-Wallis H	Detractor (N=136)	Passive (N=258)	Promoter (N=420)
A good fishing trip is … (SINGLE REESPONSE)	Yes	Yes			
Lots of fish			21.3%	15.9%	13.6%
Big fish		Promoters place more importance on 'good time' and less on fish than other groups	14.7%	12.8%	9.5%
A particular species of fish			8.1%	6.6%	6.0%
A remote place			5.1%	6.2%	2.9%
A new place		Detractors place more importance on 'lots of fish' and less on 'good time' than other groups	14.7%	15.5%	11.2%
Everyone has a good time			23.5%	34.1%	41.2%
More time to fish			9.6%	7.8%	11.9%
Other			2.9%	1.2%	3.8%
What motivates you to go fishing … (MULTIPLE REESPONSE, reported values are means[8])					
Unwinding	Yes	Detractors less than Passives who are less than Promoters	3.77	4.23	4.40
Spending time in nature	Yes	Detractors less than Passives who are less than Promoters	3.88	4.26	4.50
Solitude	Yes	Passives more than others	3.43	3.55	3.36
Spending time with family	Yes	Detractors less than Passives who are less than Promoters	3.82	4.11	4.31
Spending time with friends	Yes	Detractors less than others	3.54	3.96	3.98
Fishing competitions	Yes	Detractors more than Passives who are more than Promoters	2.47	2.24	1.93
The challenge	Yes	Passives more than others	2.92	3.19	2.87
Catching fish to eat	Yes		3.44	3.28	3.30
Catching fish to give to others	Yes	Promoters less than others	3.15	3.05	2.83
Catching fish to release	Yes		3.32	3.38	3.47
Not thinking about other things/'escape'	Yes	Detractors less than others	3.34	3.72	3.84
Leaning about nature	Yes	Detractors less than Passives who are less than Promoters	3.43	3.84	4.12
Conversations with others	At 5.2%	Detractors less than promoters	3.34	3.53	3.58
Getting exercise	Yes	Detractors less than others	3.38	3.77	3.86

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[8] Likert scale data, so not strictly valid to compare means, but allows for easy comparison; non-parametric tests have been undertaken and support core findings here.

| Fisher characteristic | Are there statistically significant differences in responses across groups? (at 5%) | | NPS Category | | |
	Chi squared	Kruskal-Wallis H	Detractor (N=136)	Passive (N=258)	Promoter (N=420)
How do fishers rate their knowledge of recreational fishing in marine parks and their different zones (MULTIPLE RESPONSE, reported values are means [1])					
Have good knowledge of how to navigate while fishing	Yes	Promotors more and detractors less than others	2.83	3.21	3.35
Have good understanding of requirements and plan where to go before trip	Yes	Promotors more and detractors less than others	2.92	3.36	3.53
Have good understanding of requirements but don't tend to plan my spots before I go	Yes	Passives more than others	2.95	3.21	2.99
Would like to develop skill in using technology to help know where I am when fishing	Yes	Detractors less than Passives who are less than Promoters	3.20	3.52	3.76
Would like to learn more about how can easily know am in a certain marine park zone	Yes	Promotors more and detractors less than others	3.22	3.60	3.78
Know where to get all the information I need on zones	Yes	Promotors more and detractors less than others	3.18	3.52	3.72
What are major challenges for knowing you are fishing in the park or specific zone? (Single response)					
No GPS on boat	Yes	Promoters less and detractors more than others	23.4%	18.0%	9.9%
Don't know how to use GPS	Yes	Promoters less and detractors more than others	10.2%	13.0%	4.0%
Often out of internet service	No		26.3%	24.5%	27.9%
No SatNav on boat	No		8.0%	8.4%	4.7%
Unsure if zoning applies to me	No		13.1%	12.6%	9.9%
New to fishing and don't know about marine parks/requirements	No		21.2%	15.7%	17.3%
Don't have any issues	Yes	Promoters more and detractors less than others	21.2%	26.4%	35.0%
Do you believe leaving areas unfished helps keep fishing sustainable for everyone now and into the future? (reported values are means[1])	Yes	Promoters more than passives who are more than detractors	3.29	3.77	4.27

| Fisher characteristic | Are there statistically significant differences in responses across groups? (at 5%) | | NPS Category | | |
	Chi squared	Kruskal-Wallis H	Detractor (N=136)	Passive (N=258)	Promoter (N=420)
Level of agreement with statements relating to social norms (reported values are means)					
Website information is helpful in knowing where I can fish	Yes	Promoters more than passives who are more than detractors	3.20	3.73	4.07
People important to me think I should fish in the permitted zones	Yes	Promoters more than passives who are more than detractors	3.14	3.64	4.17
People who influence my behaviour think I should fish in the permitted zones	Yes	Promoters more than passives who are more than detractors	3.22	3.59	4.15
People whose opinions I value prefer that I fish in the permitted zones	Yes	Promoters more than passives who are more than detractors	3.42	3.74	4.22

2.2.4 Recreational Fisher Structural Equation Modelling and typologies

As predicted by the TPB, NPS-Passive (neutral) and Promoter categories were positively associated with more positive attitudes about marine parks, positive social norms and knowledge of marine parks. The partial (e.g., through attitudes, subjective norms and perceived behavioural controls) and total effects of fisher characteristics on NPS were 'disentangled' with the structural equation modelling and are shown in Figure 3.

The most influential intangible fishing variables, for partial and total effects, were a respondent's motivation for fishing, whether they learnt to fish from family, and whether they were satisfied with the fish they catch.

Fishers motivated by being alone, practising fishing skills, and by catching fish to eat were less likely to be NPS Promoters; with most of this effect resulting from negative attitudes towards marine parks. However, fishers motivated to fish for food tended to be more knowledgeable about marine parks somewhat counteracting their negative attitudes. Those fishers motivated to 'get away from it all' in nature, and those who learnt to fish from family and were satisfied with their catch were more likely to be Promoters.

All three pathways were important for this effect, including positive attitudes, subjective norms and perceived behavioural control (Figure 3. Below).
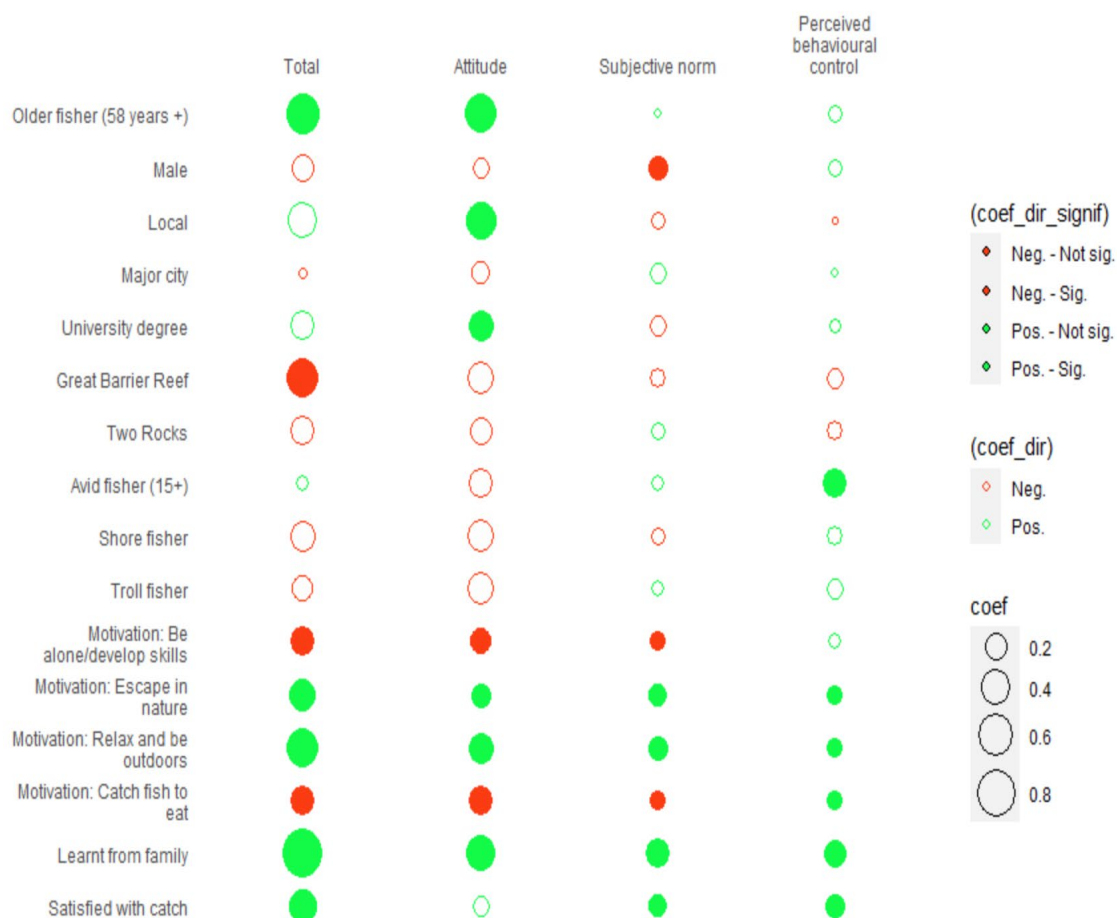

Figure 3. Results of the structural equation modelling

2.2.5 Focus groups

Comments and responses provided in focus groups were grouped according to whether they were provided by someone who mostly fished with family ('Family') or with friends ('Friends'). **Understanding a fishers typical journey provides insight for key touchpoints in future messaging type, placement and timing.**

'***Family' fishing trips** can be characterised as follows:*
- Trips can be somewhat spontaneous and opportunistic; if trips are planned, planning takes place 1-2 days beforehand, or on the day of the trip.
- Trip planning usually involves only a check of weather and tide times that are relevant to the fishers' preferred target species.
- Families usually select between regularly visited locations when the opportunity to go fishing arises.
- Families are likely to fish near shore, in estuaries or inner shore areas.
- Families do not always have advanced technologies or manual map reading abilities.
- Families frequently choose to fish outside mobile phone range; the mobile phones are carried mostly for photos during trips.
- Families make more petrol, bait, coffee, and fast food stops before and after trips than other groups.
- Families prioritise having a good time with existing social circle/family during trips (over catch).

When describing their fishing journey, the emotions 'Family'-type fishers reported at key steps in planning and taking their trip are:
- Peak of negative emotion - periods of windy, rainy, or hot weather preventing fishing.
- Peak frustration - moving (home) to a new location and needing to learn new fishing rules.
- Peak positive emotion - arriving at fishing location, spot/people sorted.
- Most Hectic - arranging food, mealtimes and location.
- Neutral emotions associated with boat/equipment, post trip cleaning and unpacking.

Specific Technology Mentioned (used pre/during/post fishing trips)
- Queensland Fishing App
- Google Maps
- Mobile phone

'Family' Perceptions of Compliance
- Believe most non-compliance is *Routine* (6/10 incidents) – involving fishers who always (or often) visit the same site and have not checked if fishing is permitted there.
- Believe the minority of non-compliance incidents are *Accidental* (4/10) – fishers simply do not know where the no take zones are located.
- Do not believe recreational fishers are purposefully non-compliant.

*'**Friends' fishing trips** can be characterised as follows:*
- 'Friends' fishing trips are often planned around the weather, with regular checks of forecasts over the days leading up to a trip. Trips planned for the intended location.
- Fishing trips are frequently planned to explore new locations.
- Fishing trips are often offshore and longer in duration than family trips.
- Fishing trips are often outside mobile phone reception.
- 'Friends' are more likely to have sounder, plotter, radio, GPS, and manual mapping skills than other groups.

- Trip preparation is likely to be between a few days and a week before the trip date e.g. stops at fishing & tackle stores, boat fuel. Only coffee stops on direct route to boat ramps.
- 'Friends' likely to have some level of self-sufficiency on the water, with fridges, packaged foods, and greater technology onboard.
- Decisions about trips less dependent on costs that other groups.

When describing their fishing journey, the 'Friends'-type fishers reported at key steps in planning and taking their trip are:

- Peak of positive excitement – Monday/Tuesday when they begin to plan for a trip the following weekend. NOTE: provides premium social media post timing for this segment.
- Peak of uncertain anticipation - Friday night, last weather check before a weekend trip NOTE: provides last planned contact time with this target segment.
- Peak of positive emotion (personal skills) – backing boat skillfully on busy ramp.
- Peak of negative emotion – being delayed on busy boat ramps by unskilled drivers.
- No change in overall trip emotion if catching fish or not.
- Neutral emotion associated with boat/equipment, post trip cleaning and unpacking.

<u>Specific Technology Mentioned (pre/during/post trip)</u> as a way of reaching this fisher 'type' or supporting them to follow the rules:
- Fishing Almanac
- GPS, plotter, sounder
- SeaBreeze App, BOM site
- Mobile phone

'Friends' Perceptions of Compliance
- Believe the majority of non-compliance (6/10 incidents) are *Accidental* – meaning fishers simply do not know where the no take zones are located.
- Believe the minority of non-compliance (2/10 incidents) are *'in the excitement of the moment'* deciding to catch and keep and good fish, or fish in a no take zone to do so.
- Believe fishers who routinely and purposefully non-compliant make up the smallest group of fishers (1/10).

3 Messaging recommendations

In designing interventions, it is important to first contextualise any past interventions and the extent to which they conformed to best practice, and any evidence of their efficacy. Data synthesis is useful when addressing complex problems that require the consideration of multiple data sources, and/or multiple disciplinary perspectives. Through synthesis we can order, group, identify and present common ideas arising from the data, to provide insights and to support improvements in management practices. As the best available data was for GBRMPA, we analysed interventions specific to this marine park. Appendix A- C includes the full analysis and findings of the review. Key insights from the synthesis of GBRMPA campaigns from 2018 to 2022 are:

- campaigns faced challenges in identifying (1) target audience, (2) where to find target audience, and (3) how to use data driven metrics to provide evidence of the effectiveness of campaign objectives and (any) actual behaviour change,

- campaigns have utilised wide ranging channels on an ad hoc basis with mixed results,

- campaigns have repeated messaging for brand awareness, achieving variable traction,

- social media campaign elements have generally not delivered the desired results,

- there is uncertainty in campaign reporting on the selection of appropriate click-based metrics and Govt benchmarks.

Although the findings are specific to GBRMPA, associated recommendations are generalisable to all marine parks and include:

- The establishment of a comprehensive strategic marketing approach to compliance campaigns that is fully integrated with other communication and relationship building strategies
- The use of the improved market segmentation data provided by this project (Chapter 5), and the integration into compliance campaigns of theoretical groundings in campaign planning such as the:
  - o 9-step behaviour change design process,
  - o include the express grounding in behavioural theories,
  - o principles of the Social Marketing Benchmarking Criteria (SMBC), and
  - o commercial content marketing best practice for creative assets development and deployment.

3.1 General recommendations – relevant to Australian marine parks

The good news is that more than 50% of surveyed respondents are considered *promoters* of sustainable fishing practices – and these positive attitudes/intentions were correlated with other variables that can be leveraged to promote more sustainable fishing practices.

The rich information we collected about the characteristics of fishers was used to develop strategies to do so. For example, almost 30% of promoters, fish with children under 18 years, and 85% had been taught to fish with family. That suggests it may be beneficial to work with inter-generational and/or family images.

Positive attitudes can also be reinforced and further developed by using positive language and framing in messages. Information about the fishers' use of social media provides insights about appropriate messaging platforms. We also used additional insights from behavioural theory to suggest other strategies (potentially useful for all fishers) that may improve compliance: nudges (see Appendix E: Nudging).

3.1.1 Messaging to leverage positive attitudes

Recommended Messaging 1: using pictures of families (see Figure 4)

- Campaign type - educational and relationship building.
- Copy focus - supportive, family friendly, reminders to check zoning regulations of routinely visited fishing spots..
- Copy tone - positive framing, simple text.
- Call to action (CTA) - lead to one stop information sources with local context/content.
- Creative examples - relaxation, connection to nature, family eating while on a fishing trip.
- Content partners - kids fishing gear, how to's - mobile phone use offline, backing your boat

Recommended Messaging 2: using pictures of friends

- Campaign type - educational and relationship building.
- Copy focus - supportive and non-judgmental content to enable compliance and to promote understanding of the long term benefits of 'no take' zones in securing fish stocks, and recreational fishing, into the future
- Copy tone - positive framing, simple text.
- CTA - leads to one stop information sources.
- Creative examples - wildlife sighted from fishing boats, feelings of space and freedom on the water, away from urbanization.
- Content partners - tips about fishing & steps to take when planning to explore new fishing locations.

Image selection:
- family based image
- gender diverse
- multi-generational
- ethnically diverse
- compliance action measuring fish
- everyone happy in photo, making positive memories
- ideally clothing would be target market preferred brands and be sun safe
- ensure image has relevant fish species

Figure 4 Sample of images used. Many fishers - are motivated by having a nice day on the water where everyone enjoys themselves – imagery that is diverse and features families actively teaching children how to fish is an important leverage point.

3.1.2 Swaying Passives

The aim of messaging campaigns for this group is to move them towards 'becoming' (i.e., identifying as) Promoters. Many of the Passives leaned towards the Promoter end of the scale, rather than

seeing themselves closer to detractors, which is a possible indication that they are 'nudgeable' in future campaigns. Our results showed that Passives while largely considering themselves to exhibit compliant recreational fishing behaviours, were uncertain of the science value of their behaviours i.e., their ability to effect change. For this group we would recommend that campaign messaging explicitly target positive improvements to marine areas arising from zoning requirements. This may include messaging through science communicator, peer end-users such as tourism operators and respected recreational fisher opinion leaders, observations by general fishers in peer-to-peer communications.

3.1.3   Reaching Detractors

Detractors are the most resource intensive group to shift compliance behaviours. It is unlikely to receive or respond to messages from the Marine Park Authorities. They are more likely to respond to messages from peers, in particular those from fishing clubs. We recommend relationship building and the long-term use of social norms to slowly nudge their behaviour towards compliance with 'no take' zones. Given detractors are swayed by catching fish, in particular larger fish, peer messaging and physical demonstrations of big fish catches in well managed marine parks (with 'no take' zones) may be a leverage point. This message would best be transmitted via on water outcomes for peers who are 'fishing in the right place and catching the big fish'. Catching detractors in acts of non-compliance through active patrols is the likely management action needed for this group where other interventions prove ineffective. We assisted the GBRMPA team in wording around enforcement correspondence and recommend further research into end-user interventions measures such as compulsory education programs.
Outcome: continue to build relationships with fishing clubs and the types of events or member messages that can support this.

3.1.4   Making compliance officers both 'visible' and 'personable'

Compliance is a function of perceived risk and the consequences. This is often reported in the literature (Kuempel et al. 2017; Weekers et al. 2019; Thiault et al. 2020) and was borne out by comments made during focus groups. Messaging that highlights fines for non-compliance in 'no take' zones can raise the visibility of consequences. However, our quantitative survey and focus groups, emphasised the low perceived risk of being caught. There was also interest in seeing a physical presence of compliance officers and an increased perceived compliance effort. We recommend implementing messages and physical activities that elevate the visible presence of compliance officers on land as well as on water. These include:

- Officers wearing a recognizable uniform.

- The presence of compliance officers engaging in supportive relationship building conversations in common shore-based fishing areas like beaches and piers. This is important both for relationship and trust building aspect, as well as perceptions of compliance activity/effort.

- Featuring compliance officers in the easily recognised uniforms in 'day in the life of'-type story telling videos for GBRMPA, and channels such as YouTube.

- Featuring compliance officers in the easily recognizable uniforms in relevant marketing images (such as images showing uniformed compliance officers showing recreational fishers how to read a map or use an app), and

- Featuring a diversity of compliance officers in imagery (e.g., male, female, varied ages, etc.).

3.1.5   Improving existing asset message clarity & transition to active CTA

Individual campaigns are formed as part of a broader scope of work outlined in the organisations wider marketing strategy. For example, by reviewing several years of GBRMPA social media postings, we identified several broad campaign messages. We selected #lovethereef as the most appropriate cross-over between organisational messaging and compliance messaging, for the purposes of the pilot study (see Figure 5). By making this connection, we connected the sentiment of loving the reef with positive self-regulatory compliance actions in the pilot campaign messaging.

Recommendation: Explore ways to develop the use of integrated campaign messaging as part of a whole of organisation strategy for compliance communications.

We also found previous GBRMPA campaigns have been successful in creating general awareness in the fishing community of the existence of zoning rules. However, to drive compliance, the messaging needs were for education and access to tools to enable compliance (knowledge of zone locations and restrictions, maps and apps for navigating).

Recommendation Shift existing campaigns from the current 'awareness' focus to education and relationship building, with specific calls to action' that link users to tools such as apps and physical maps to enable compliance.
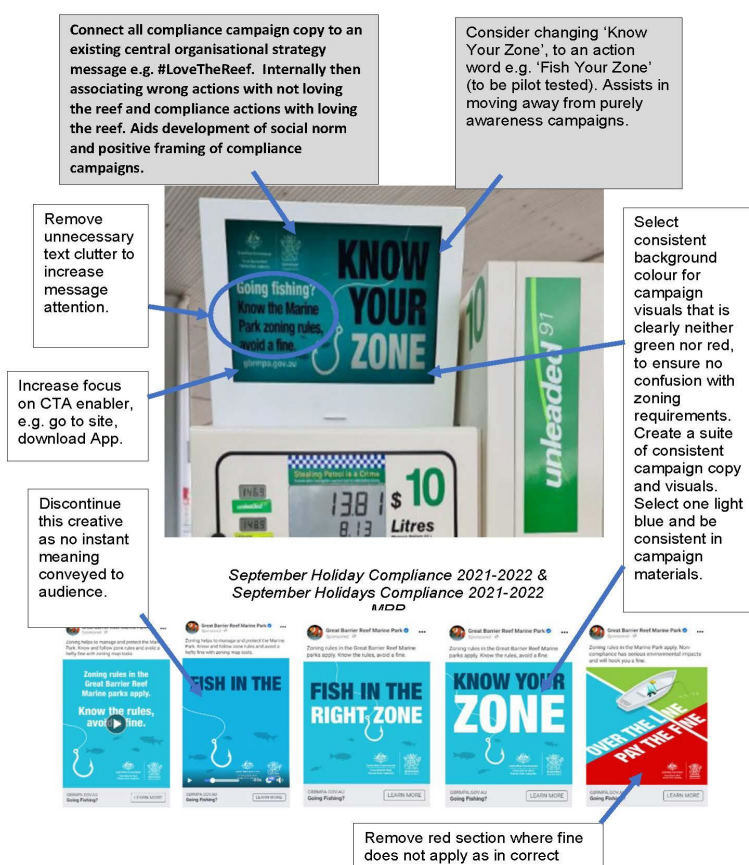

Figure 5 Samples of ways in which messaging can be minimally altered to leverage values and attitudes for more sustainable fishing practices.

3.2   Piloting bespoke messaging for compliance with the Great Barrier Reef Marine Park Authority

A pilot campaign was developed in collaboration with GBRMPA staff that adhered to the recommendations for the 'Family' and 'Friends' fisher-types, as well as broader campaign recommendations, including a shift from 'awareness raising' campaign content to education focus campaigns, and a clear 'call-to-action' that provides simple click-through pathways to resources (apps, maps, information) to support compliance. The pilot campaign creatives were also accompanied by the revision of a feedback matrix and traffic light system to guide all replies on meta-ads to help build relationships with Facebook users (See Appendix D for this system which was deployed alongside the meta ads in May/June, 2023).

We used A/B version to test efficacy. Each group had two appealing images based on our survey results (Figure 6 and Figure 7). For the pilot these images were obtained through still frames from video footage obtained by GBRMPA. For future campaigns a creative brief with more specifically targeted still photography imagery and video should be commissioned and formed into a database for long term use/reuse across media campaigns.

In the text for each image we included (1) succinct messaging about zoning from the existing campaign messaging (know your zone), (2) an emotional appeal component (fish for their future) to help build relationships, (3) an element from the overarching organisational communications from existing campaigns to (love the reef) to connect compliance with positive environmental action, and (4) a CTA to download resources from the GBRMPA's website.

In the A/B testing, the image was held constant, and the messages were varied. We then compared the results for the two image and message variations for each fisher type. The ordering of these messaging components provided insights into the target audience messaging preferences.

3.2.1   Developing bespoke creatives and messages

The messaging guidelines for families that were taken up by GBRMPA include:
- *Campaign type* - educational and relationship building.
- *Creative* - Here we chose two creatives – one with a cropped shot of a grandfather teaching a grandson to fish (intergenerational), and one of the entire family group, shown in Figure 6. Both creatives **capture the sense of quality time as a family while on the water**.
- *Copy focus* - supportive and non-judgmental, information provided to enable compliance with 'no take' zones and to highlight the value of compliance in maintaining fish stocks and securing the 'fishing lifestyle' into the future.
- The messages were **'fish the right zone'** (A text) and **'fish for their future'** (B text).
- *Copy tone* - positive framing, simple text.
- *CTA* - 'Get free maps, app, and more at gbrmpa.gov.au', leading to 'one stop' resources.

Figure 6. Family creatives displaying combinations of visual and messages (copy) in meta ads

The messaging guidelines for 'Friends' that were taken up by the GBRMP:

- *Campaign type* - educational and relationship building.
- *Creative* - Here we chose two creatives - one with a group of Friends (group) and one of a solo shot but cropped to indicate others are on board (single). Both **capture the sense of enjoyment and fun from a day together while fishing** (See Figure 7).
- *Copy focus* - supportive and non-judgmental, information provided to enable compliance with 'no take zones' and to promote understanding of their long term benefits in securing fish stocks, and recreational fishing, into the future.
- The messages were **'fish the right zone'** (A text) and **'love the reef'** (B text).
- *Copy tone* - positive framing, simple text.
- *CTA* - "Get free maps, app, and more at gbrmpa.gov.au" which leads to one stop information sources.
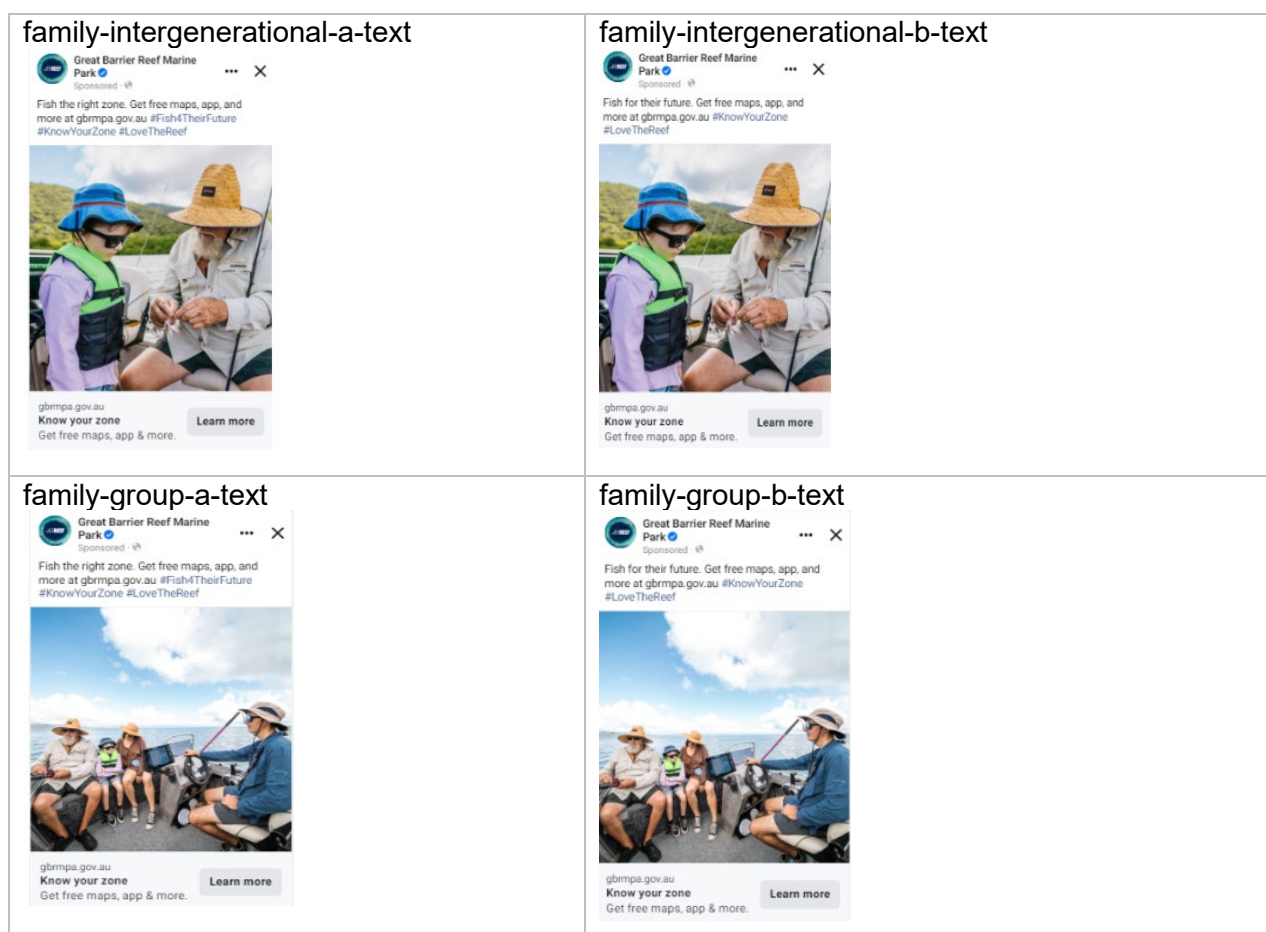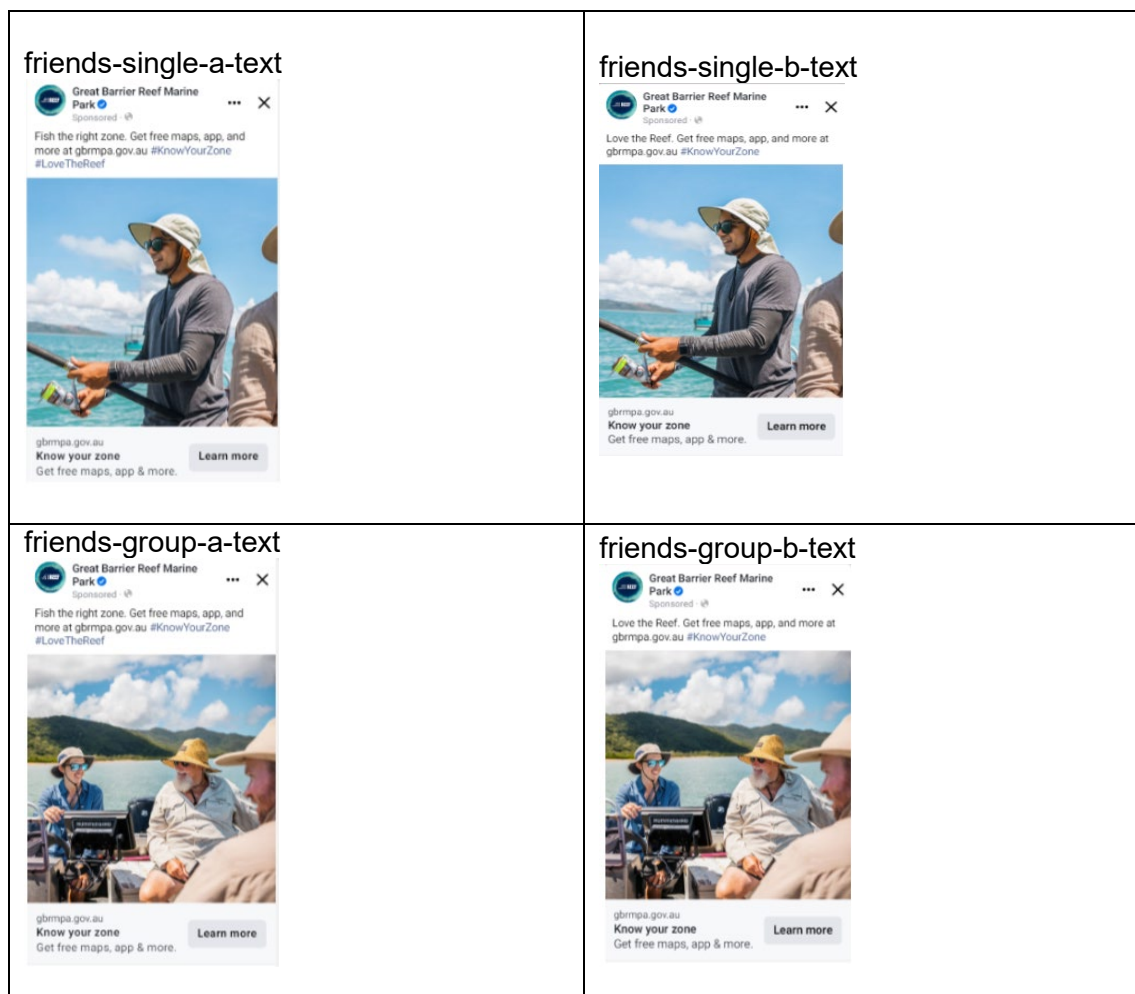
Figure 7. Combinations of creatives and messages used for friends for meta ads

3.2.2 Testing the efficacy of a bespoke messaging to drive compliance – results from the GBRMPA pilot campaign

3.2.2.1 Evaluation Metrics

Insights from our work were used by professionals within the GBRMPA to trial some new 'creatives' (the combined elements of a marketing campaign, including images and text) and messaging approaches. We tailored the Valid Metrics Framework (Figure 8) for the current context and used this to inform the identification and selection of the indicators used to monitor and evaluate the changes in campaign messaging. Metrics are summarised in Table 5; with the more detailed discussion of the reasons for choosing each providing in the subsections below.

Figure 8. Excerpt from the Valid metric framework, based on social media metrics model (Jeffrey 2013).

We adapted this framework by defining each metric in the context of recreational fishers with recommended specific metrics in for GBRMPA.

EXPOSURE – Have we reached our target audience?

Exposure refers to how many people 'see' the marketing content of your campaign i.e., how many people you 'reached'. Where possible, we sought to use the GBRMPA commissioned industry market reports that characterise not only the number of views, but also the avera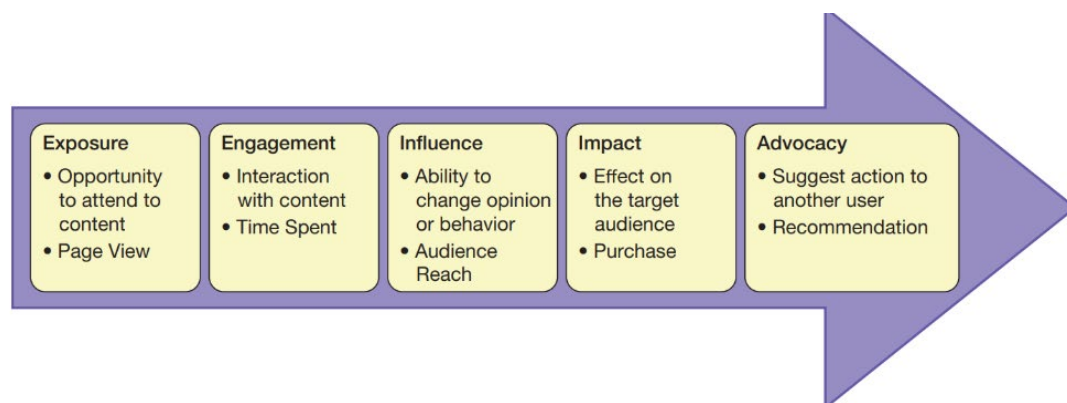ge demographics of those who viewed the campaigns. Many campaigns, particularly awareness campaigns rely largely on exposure, or 'reach' metrics. However, these basic 'reach' metrics only provide a starting point. For example, marketing campaign providers that guarantee to return an audience, as per paid segments, will simply match the market scope provided to them by the client within the specific budget. For a campaign run alongside or within a particular channel platform or other media such as television or radio, the exposure metric collects demographics for the audience that saw that particular content. There are insights that are possible, and more useful to measure success.

We sought to enhance the characterisation of the audience reached, and, where relevant, to further characterise reach for each of the creatives (the posts containing images and text messages targeting our fisher types in A/B testing).

The indicators used included:
1. the GBRMPA website zoning page visits,
2. reach and frequency from GBRMPA's commissioned industry management reporting services, and
3. reach reported for YouTube and Facebook posts.

Our audience reach metrics included,
1. number of views on YouTube
2. number of views on Facebook
3. GBRMPA's zoning page (not linked to campaign or local marketing QR codes)
4. reach and frequency for other channels via commissioned industry management reporting.

Our segment characterisations for reach included,
1. key demographics were age, gender, household size/number of dependents,
2. average audience for each channel or social media platform utilised, and
3. tracking views and demographics for 'Family' and 'Friends' creatives separately where possible.

ENGAGEMENT- Have we engaged our target audience?

Engagement refers to how actively involved your audience was with your content. We sought to capture the extent to which the audience engaged and responded to key messages. In particular, the time spent interacting with the messages and subsequent responses to the CTA (e.g., clicking through to GBRMPA website, downloading the app, and/or visiting an office to get a paper zoning map). We note that merely clicking on a message, for example on Facebook, does not mean necessarily an audience member has engaged with and internalised key messages or the CTA.

Sources of engagement insights were click-through-rates (CTR) from platforms, brand lift survey (Industry commissioned report/Google analytics) and measures of retention of all public conversations on GBRMPA pages and ads for in house analysis. Indicators included:

1. Click through rates (CTRs) across ads and platforms (tabulated separately from independent visits to the GBRMPA zoning page),
2. Brand lift survey to capture ad recall: Which of these brands have you seen a video ad for recently?: 1. Know your Zone – Marine Parks (30 characters); 2. Tackle World (30 characters); 3. Freddy's Fishing & Outdoors (30 characters); 4. Whittley Boats (30 characters); 5. None of the above, and
3. NESP (Australian Government's National Environmental Science Program) research team analysis of sentiment for Facebook conversations with GBRMPA (full conversations retained, i.e. all posts and replies from Facebook on ads and on GBRMPA owned pages for team analysis of quantity and content/sentiments of conversations).

INFLUENCE - Have we influenced our audience so they intend to follow fishing zone rules?

We sought to capture whether the messages influenced fishers' intentions to follow zoning rules. As it is impractical to seek to measure public statements about compliant intentions, or actual compliance behaviour, we used a proxy measure. That is, a fisher's willingness to recommend sustainable fishing practices (that include 'no take' zones) to others. Our quantitative survey used the NPS score to measure this intention.

The NPS has emerged from the marketing literature and is widely used by industries to gauge loyalty and the proliferation of various views via 'word of mouth' (Reichheld, 2003). The NPS compares the % of respondents who are Promoters (loyal enthusiasts promoting sustainable behaviours) with the % of Detractors (those who are do not actively support sustainable behaviour and may actively impede growth in such behaviour by negative word of mouth). In this case, observable metrics around intention may be the extent to which the audience refers content onwards to friends and family. We note that referencing onwards is also commonly used to measure advocacy.

We suggested measuring how the audience responded to the messages in terms of sentiment, recommendations, and engagement (social listening), as well as whether they took the next step (following our CTA), by clicking through from the zoning resources page to resources such as the app to download, or maps.

Sources are CTR from the GBRMPA zoning page to individual resources, iSentia, and Sprout. Indicators are:

1. Click through rate from the GBRMPA zoning resources page to individual tools (such as app or other resources), and
2. iSentia and Sprout monitoring for social listening on public related pages (e.g. boating, fishing, camping). The number and types of conversations, and sentiments (both good and bad), on public pages on related topics including the Great Barrier Reef, fishing, and compliance or fishing in the right zones.

IMPACT - Has our audience changed their behaviour as desired?

Beyond intention to act we wanted to oversee actual behaviour change – in this case following marine zoning rules to fish in the right places. The ideal indicators would be to observe changes in compliance as a function of number of users on the water, before and after the bespoke messaging campaigns, as well as exploring with marine park users the extent to which they engaged with messages and had a positive experience, including using related online resources.

Impact will require the ongoing monitoring of compliance events as well as an improved metric to determine how many boats are on the water at a particular time. This is needed to establish the proportion of fishers doing the right thing, versus those continuing to break rules, by dividing the number of detected compliance issues by the number of boats active over the same time period. Over time, we would expect the proportion of users doing right thing to increase. Such metrics are proposed for future monitoring.

In the short term, **audience engagement with call-to-action messages is a lead indicator for behaviour change.** Here we monitored simple indicators of behaviour change, like downloading the app and getting a paper map. We will also summarise recent compliance events and compared them to similar time periods in previous years.

The data sources used in this project are GBRMPA app download tracking, GBRMPA map handouts, and the GBRMPA compliance data.

The quantitative indicators used are:
1. The number of downloads of app separated by first-time downloads and re-downloads,
2. Additional CTA metrics – compliance/navigational tool web page visits, number of paper maps handed out over the campaign period, and
3. Compliance events over the time period and compliance effort as currently tracked (recommended changes to this provided in table for future monitoring).

The qualitative indicators included:
1. Unsolicited feedback received by the marine park authority about recreational fishing, and
2. The available resources such as the app, maps, and resources zoning page.

ADVOCACY - Is the audience also encouraging others to act in a similar way?

We sought to determine whether the audience recommended the same products (compliance resources) or compliance with the zoning rules. We recommend content or sentiment analysis of hashtags and conversations on social media platforms to detect the extent to the audience advocated for changed behaviour, in interactions with their peers.

Advocacy could also be monitored through the sharing of content by fisher peer leaders or brand ambassadors. Such activities of such 'influencers' are potential future indicators as GBRMPA identifies and builds relationships with peer leaders.

For this campaign we recommend iSentia and Sprout social listening to explore the extent to which the audience is sharing content in a positive way.A Valid metrics framework was modified to assist GBRMPA plan and track the campaign (see Table 2).

*Table 2. Quantitative and qualitative metrics for monitoring and evaluation of campaigns. * indicates an indicator agreed upon for May/June 2023 pilot*

Metric type	Exposure	Engagement	Influence	Impact	Advocacy
Question the metric is answering	**Did the intended audience receive the message?**	**Did the audience engage with or interact with the message?**	**Have we influenced our audience so they intend to adopt a particular behaviour?**	**Has our audience changed their behaviour as desired?**	**Is the audience encouraging others to also act in a similar way?**
Quantitative metrics	*Number of views of each campaign location (Reach report UM, Facebook and YouTube paid reach reports) *Independent clicks on direct website (separate to CTR)	*Click through rate (CTR) (from ads to GBRMPA zoning page)	*click through rate from GBRMPA zoning resources page to individual tools (such as app or other resources)	*Number of downloads of app separated by first-time downloads and re-downloads.	Hashtags Shares or posts depending on platform
	*Audience demographics for campaigns by Mate and Family creatives (e.g. Facebook campaign summary and UM report including: age, sex, location, and date/time stamp of view)	*Ad recall (UM Brand lift and Google)	Hashtags Shares or posts depending on platform	*Additional CTA metrics – compliance/navigational tool web page visits number of paper maps handed out over the campaign period	Fisher peer leaders recommending GBRMPA actions
		Number of posts or replies on GBRMPA ads on Facebook		Number of boats on water- estimated based on counters at boat ramps Compliance events over time period % non compliant boats (=Compliance events/total boaters)	

Metric type	Exposure	Engagement	Influence	Impact	Advocacy
Qualitative metrics		*Retain full conversations (all posts) on ads from Facebook and analyse in house or with NESP research team for sentiment analysis	*iSentia and Sprout monitoring for social listening on public related pages (e.g. boating, fishing, camping). Number and type of conversation, and sentiments (both good and bad), had on public pages regarding topics including GBR, Fishing, and compliance or fishing in right zones.	Unsolicited feedback specific from marine park users to GBRMPA that are specific to navigational aids (app and maps) ads. Analyse in terms of sentiment (positive/negative) and whether they found the aids useful to best navigate zones	TV Sponsorship organic posts by advocates
				Compliance officer and information office staff handing out maps, personal reflections on engagement over period. Recommend design of simple feedback survey for app users and map users also to ask them about why they've chosen to use particular aids and how they heard about them and any feedback they have.	

3.2.2.2 Evaluation – Preliminary Results

We analysed the results of the campaign from a 4 week data collection period (May/June 2023, with the following core findings (as available on 21 June; note we do not yet have exposure metrics so are unable to report on those).

- Facebook is a relevant platform for target market messaging for GBRMPA compliance campaigns.
- Aligning relationship building copy and creative resonates with all target market segments.
- Different audiences are accessible, but can be approached differently in the marketing strategy if GBRMPA needs to reach particular groups for a specific purpose e.g. a social media / coms implementation plan would have messaging throughout the period with the same base message formulated to connect with each distinct audience segment, based on their values.

Reach and overall engagement: We measured reach (total viewers of the ads) and click through rates (CTRs), that is the proportion of users who saw the ad and clicked the link in the 'CTA'. To measure 'retention' of users who clicked through to the landing page for resources on the GBRMPA website, we measured clicks on that landing page (CTLP) and resource download rates. These measures establish the effectiveness of the CTA.

Table 3. Summary evaluation of exposure (reach), engagement (CTR), influence (CTLP)

Ad name	Spend	Exposure (Impressions)	Clicks from FB	Engagement (click through rate CTR)	Clicks on landing page	Influence (retention landing page)
RE|PLA|Family 0008 A|:D	$2,751	830,008	659	0.15%	329	50%
RE|PLA|Family 0008 B|:D	$2,749	840,169	545	0.12%	419	77%
RE|PLA|Family 0034 A|:D	$2,750	849,423	849	0.19%	304	36%
RE|PLA|Family 0034 B|:D	$2,749	841,897	1,012	0.24%	934	93%
RE|PLA|Mates 0087 A|:D	$2,749	837,779	740	0.17%	470	64%
RE|PLA|Mates 0087 B|:D	$2,752	855,707	833	0.22%	533	64%
RE|PLA|Mates 0099 A|:D	$2,748	840,196	480	0.11%	308	64%
RE|PLA|Mates 0099 B|:D	$2,748	848,380	516	0.13%	323	63%

We discuss the metrics presented in Table 3 by each values framework metric below.

ENGAGEMENT- Have we engaged our target audience?

Engagement measured by click through rates from the meta ads ranged from 0.11% to 0.24%; the best performing content was the Family Group B text followed by Friends group A and B text. Retention rates of users who clicked through to the landing page ranged from 35% to 93%. Family Group B text was again the highest performing content, followed by Family Intergenerational B Text, Friends group A and B text (all with retention rates of 70% or higher). **This demonstrates the messages reached the right target market of fishers and translated into effective engagement**.

Sentiment analysis by UM of comments on Facebook ads found comments were neutral, but typically quite genuine. Our qualitative analysis of all comments to date found that 60-100% of comments on the ads are from users engaging with the content by 'seeing themselves' in the imagery; for example, friends tagging others or commenting that they 'did a double take' or thought the image was of someone they knew. This 'recognition' resulted in positive shares and tags with others engaging in jovial commentary with one another.

Outside of these relationship building discussions there were two comments around 'or cop a fine' from a single user, and 1 anti-government comment unrelated to zoning or recreational fishing. There were two genuine comments around the app not functioning on android systems and the prepared reply based on traffic light comments (Appendix D) worked well. This flags the need for an app that meets all user needs.

Collectively, quantitative and qualitative data indicated **the campaign met its key objective of engaging with your users to build relationships and improve their access to, and engagement with, the right navigational tools to follow zoning rules.**

INFLUENCE - Have we influenced our audience so they intend to follow fishing zone rules?

The most engaged audience segments, based on clicks through to the resources page, came via the Family Group B text, followed by Family Intergenerational B Text, Friends group A and B text. The highest engagement, based on downloads of the tools, came via the Family group B text and Friends group B text, which had statistically higher rates of downloads relative to the A text for those images. We believe this suggests the campaign may be having some positive influence, to the extent that downloading GBRMPA web data shows an intention to follow compliance rules in the park.

IMPACT - Has our audience changed their behaviour as desired?

When considering impact, we summarise recent compliance events and compare them to similar time periods in previous years.

Overview: Statistical analysis of performance

The meta ads were designed to allow statistical comparisons of campaign performance across creatives by holding the imagery constant for each A/B pairing, and varying the copy content and ordering of the message.

To determine which creative image performed best (based upon CTR and Click to land page as a means of testing intentional CTR) for each target market, we calculated fishers exact test for CTR for each creative within the target market. Where the test resulted in a significant p-value we could conclude that the creative with a higher CTR statistically outperformed the alterative. We would, therefore, recommend the higher performer as the preferred creative approach for this campaign type or relational appeal, platform, and

audience segment in the future. Where the p-value was not significant, we could not reject the null hypothesis (that there is no difference in creative content). Instead, we recommend the continued testing of creatives (and messages) to further refine them, or to retain diversity in marketing materials.

Within the best performing creative we compared messages based on the A-B pairing and also on their CTR. We further tested this result by comparing the download rates among those who clicked through to resources landing page. The A-B testing employed a fishers exact test to account for small sample sizes.

Best performing creatives

For the 'Family' creative, the group image outperformed the intergenerational image with a fisher test p value <0.001. This result is robust across metrics noting that the higher click through rate results in a more engaged pipeline of users on the landing page and then within resource downloads (Table 4).

For the 'Mate' creative, the group image outperformed the solo image with a fisher test p value <0.001. This result is robust across metrics noting that the higher click through rate results in a more engaged pipeline of users at landing page and then within resource downloads (Table 5).

Table 4. Family creative image performance metrics with the creative image that performs best in green text (p<0.001)

Image	Impressions	Clicks in Facebook	Clicks to landing page	map download	app download	CTR	CTLP	map download rate	app download rate
family-international	1,670,177	1204	748	7	8	0.07%	0.04%	0.94%	1.07%
family-group	1,691,320	1861	1238	21	28	0.11%	0.07%	1.70%	2.26%

Table 5. Friends creative image performance metrics with the creative image that performs best in green text (p<0.001)

Image	Impressions	Clicks in Facebook	Clicks to landing page	map download	app download	CTR	CTLP	map download rate	app download rate
friends-group	1,693,486	1573	1003	11	33	0.09%	0.06%	1.10%	3.29%
friends-single	1,688,576	996	631	9	6	0.06%	0.04%	1.43%	0.95%

A-B testing result of messages for top creative images

For the **Family groups 'creative' A-B testing, the 'fish for their future' message performed best** with a p value <0.001. This result aligns with the underlying values of the fishing experience, insights from the literature, and anecdotal reports from fishers that suggest 'doing right' and social responsibility for fishers who have children, or who fish with children present.

For the Friends group creative A-B testing, there was no statistical difference for CTR for the two messages. However, when comparing further engagement, message B performed best for app download rates. While this suggests the B text may perform better in engaging an audience actively seeking the right tools for navigation (namely the app), we suggest this is an inconclusive result, as we would expect the A-B testing to follow the pipeline of performance metrics. Further testing of messages that are best aligned with the motivations of the 'Friends' group is recommended.
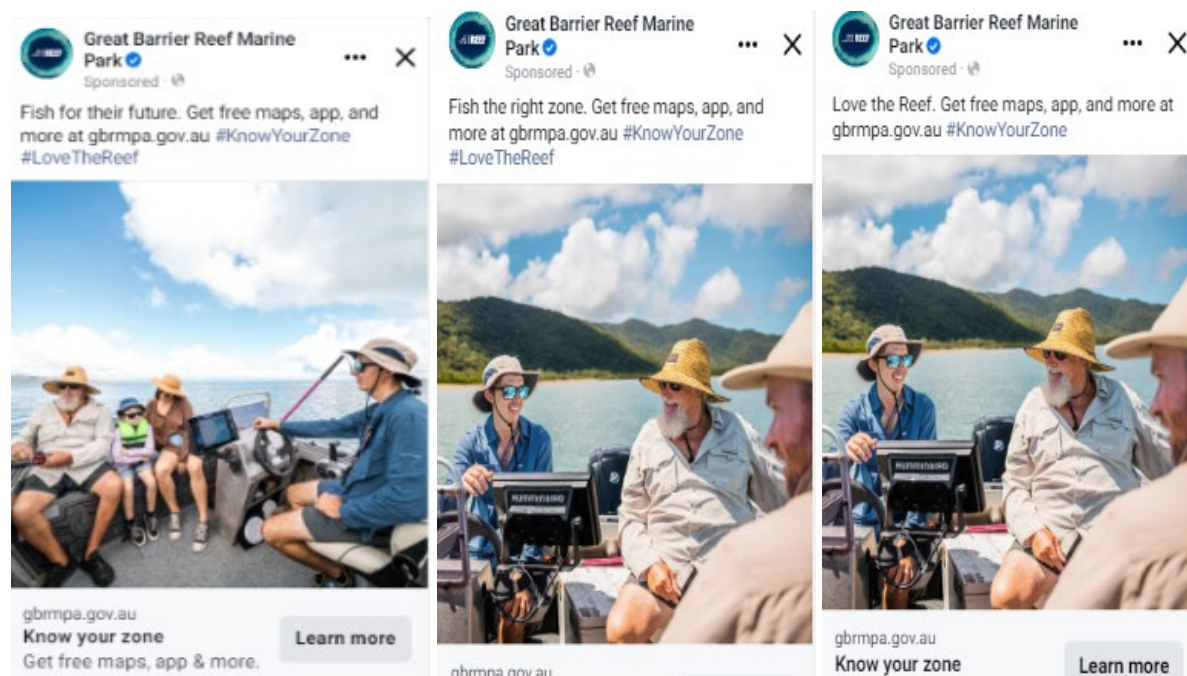

Figure 9. Final best performing creatives. Family group 'Fish for their future' and Friends Groups 'Love the reef' and 'Fish the right zone' creatives.

Campaign performance relative to past campaigns

Past campaigns have relied on cost metrics as a key measure of success. Here, we use these same to gauge the cost-effectiveness of bespoke messaging against past campaigns as they are familiar and readily available through UM reporting to GBRMPA. We used the cost metrics typically applied by GBRMPA to gauge value for money (see Table 6).

However, we would generally encourage cost-effectiveness to be used only as secondary measure to complement more meaningful primary metrics. The most important (primary) measure of success of a campaign is whether it achieves its intended purpose (e.g. reaching the right audience with the right message to achieve the desired impact. Once the right

marketing strategy has been developed to achieve the intended impact, it can then be optimised to provide true value for money.

Relative to past campaigns, reach was extended in this pilot. This indicates the selected social media platforms of Facebook and YouTube, in particular, were relevant platforms for the target market, and that by including females in the target audience reach and engagement were enhancements to the campaign.

In addition, the cost efficiency in reaching the target audience was improved by aligning the copy/text and creatives with each fisher 'type' to ensure messages resonated with each group (the CPMR was below the GBRMPA benchmark of $11.50, **outperforming past campaigns fivefold**).

Table 6. Summary evaluation of value for money metrics (CPM, CPMR, CPLPV) as a comparison of performance against past campaigns.

Where a metric is at benchmark shading is in orange and where it outperforms benchmark shading is in green. The previous benchmarks that campaigns have been evaluated for are CPLPV of $2.94 (June 2021) but noting the best performance of GBMPRA ads has been $5.74 (fishing creative 2 June 2021); CPMR of $11.60 taken from the overall Australian Government results of FY 20/21 (but noting the campaign September 2021 delivered a CPMR of $25.26); and CPC (no benchmark specific found for past meta ad campaigns but note that range of cost achieved in the $5-$6 range).

Ad name	Spend	Impressions	Clicks from FB	Clicks on landing page	CPM	CPC	CPLPV	CPMR (estimated)
RE|PLA|Family 0008 A|:D	$2,751	830,008	659	329	$3.32	$4.18	$8.36	$6.26
RE|PLA|Family 0008 B|:D	$2,749	840,169	545	419	$3.27	$5.05	$6.56	$6.05
RE|PLA|Family 0034 A|:D	$2,750.65	849,423	849	304	$3.24	$3.24	$9.05	$6.16
RE|PLA|Family 0034 B|:D	$2,749.56	841,897	1,012	934	$3.27	$2.72	$2.94	$6.52
RE|PLA|Mates 0087 A|:D	$2,749.12	837,779	740	470	$3.28	$3.72	$5.85	$6.32
RE|PLA|Mates 0087 B|:D	$2,752.07	855,707	833	533	$3.22	$3.30	$5.16	$7.27
RE|PLA|Mates 0099 A|:D	$2,748.73	840,196	480	308	$3.27	$5.73	$8.92	$6.30
RE|PLA|Mates 0099 B|:D	$2,748.29	848,380	516	323	$3.24	$5.33	$8.51	$6.92

4 Summary of key findings and messaging conclusions

The work outlined in this report focused on the problem of 'compliance' with marine park zoning laws. Our primary aim was to find ways to encouraging recreational fishers to *fish the right zone*, by improving messaging and relationship building.

We used insights from the literature to develop a questionnaire which was used to start 'profiling' different types of fishers. Information from the questionnaire was analysed using a variety of statistical methods, to answer the following questions:

1) Do fisher attitudes, norms and perceptions about fishing regulations correlate with intentions to promote sustainable fishing practices? If so, in what way?

2) Are there statistically discernible differences in the above relationships between fishers in different regions?

4) Are behavioural intentions correlated with other variables that can be leveraged to promote more sustainable fishing practices?

Insights from the quantitative analysis were used to inform the development of questions for focus group discussions that sought supplementary qualitative information from fishers.

Together, these insights were combined to develop general messaging recommendations and some bespoke recommendations for the GBRMPA. A subset of recommendations was taken up by the GBRMPA and used within *campaigns* run during May and June 2023. A range of metrics were used to monitor and evaluate the effectiveness of the campaigns, focusing particularly on metrics related to the new messaging strategies.

We delivered improved evidence-based core marketing creatives for GBRMPA that leveraged the attitudes, motivations and characteristics of fishing population dominated by people who are generally supportive of sustainable fishing practices (*Promoters* and *Passives)*. Although our research found messaging campaigns are unlikely to be effective for the deliberate and calculated non-compliance 'Detractors' identified in our survey, we provided further advice and support for compliance efforts. This includes improved messaging embedded within infringement notices, increased reporting of court consequences for non-compliance, and increasing the visibility of compliance officers on water and on shore.

The GBRMPA pilot campaigns reached their target markets and proved more effective than past campaigns in driving traffic to the landing page (measured with CTLP) and the subsequent uptake of navigational aids to help fishers avoid 'no take' zones (measured with download rates of resources).

The campaign advice including design best practice, message design, traffic lighting for managing online feedback for staff, and campaign evaluation can be applied to future GBRMPA campaigns to further improve 'creatives', and campaign alignment with GBRMPA's compliance and wider communications strategy.

Our research to date demonstrates that the recreational fishing population is diverse, most fishers are aware of, and support, marine park zoning rules. However, marine park users find it difficult to access, interpret, and follow rules while on the water. This is due to a lack of

confidence in using navigational tools, and the wide variety of tools that provide highly variable support for locating and complying with marine park zones.

To address this gap, we recommend further research. We need in-lab piloting of coupled messages and nudge design to improve recreational fishers' use of navigational aids while on the water to support compliance with marine park zones. Examples of nudges to test would include the 'look' of marine park zones in app (e.g. traffic lighting to convey no fishing), sounds or alerts such as a bell to indicate that a user is no inside a marine park zone, and messages.

Based on the foundational work presented here, we expect these lab tests would provide the evidence required to optimise the design of, or to inform improvements in, existing navigational apps to deliver higher rates of compliance by addressing different circumstances that may be underlying the non-compliance. For example, improved navigational tools and nudge-based alerts to assist 'accidental' fishing in no take zones.

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APPENDICIES

Appendix A: The 9 step model for behaviour change research

There has been a growing recognition of, and interest in, soft touch behavioural change interventions --or nudges-- to address marine park zoning compliance. Such interventions have the potential to empower marine park recreational users (more specifically recreational fishers for this report) to make choices for their own behaviour that are beneficial to the overall marine protected areas. If effective, such light touch interventions have the potential to be a cost-effective intervention to target and improve compliance behaviours. The design of such interventions, however, must be aligned with behaviour change theory and informed by formative research to ensure they are well designed and result in the desired behavioural outcome (and do not result in any perverse outcomes).

The 9 step framework for designing, testing and evaluating behaviour change interventions is shown at Figure 10 (see also https://www.nespmarinecoastal.edu.au/project-1-17-information-sheet-3/ for further details on methods and background).
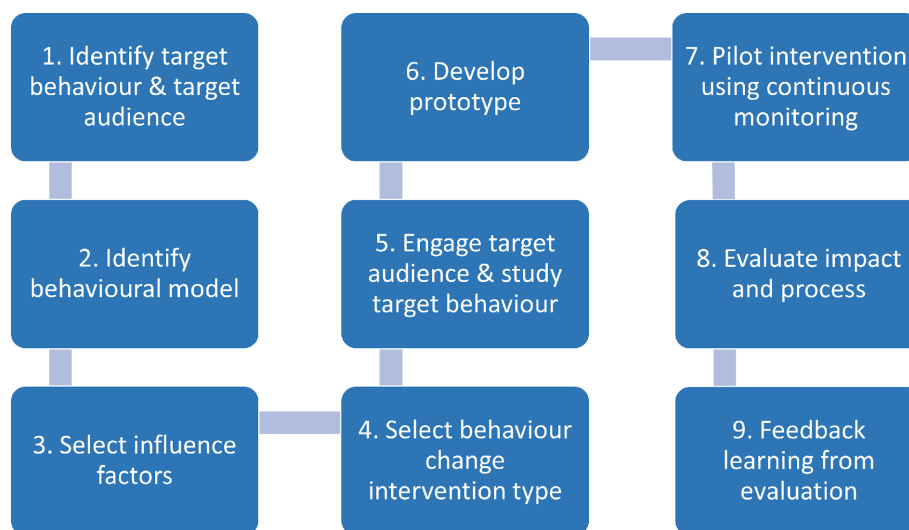

Figure 10. 9 step model for designing, testing, and evaluating behaviour change interventions.

Appendix B: The Braithwaite Model

Recreational fishers are commonly categorised based on their compliance behaviour using the regulatory compliance model (Braithwaite 2002) – a model that is used by the GBRMPA to guide the development of compliance strategies (Figure 11).
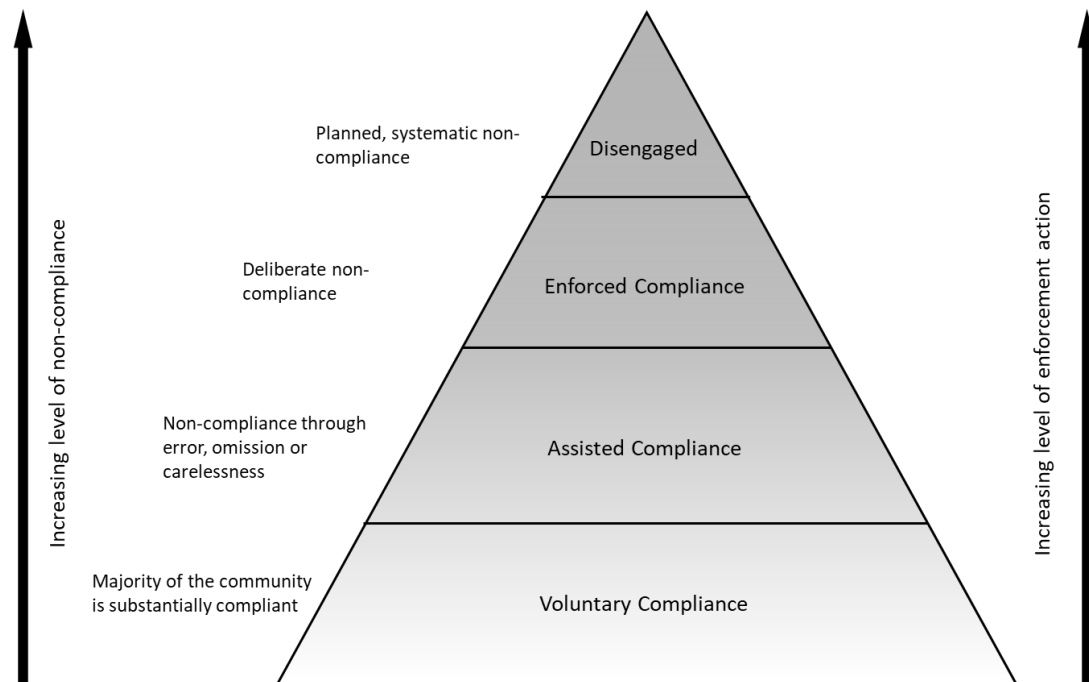

Figure 11. The Braithwaite model for compliance management, adapted from GBRMPA draft compliance policy

The model identifies four categories of recreational fishers ranging from those who are aware of regulations and voluntarily compliant through to those who engage in intentional and serious non-compliance (the 'disengaged'). At the bottom of the pyramid are the majority who voluntarily comply with requirements, or where they are non-compliant it is through accident and thus education and information are an appropriate intervention to address non-compliance. A second category, who require assistance to comply, either through routine ignorance (often via routine and assuming they are doing the right thing) or carelessness (knowing their behaviour such as fishing the line may accidentally result in non-compliance but take the risk), may engage in non-compliant behaviour. However, when assisted to adjust their behaviour they do so willingly. The accidental and ignorant/careless groups may be supported through nudges or light touch interventions including messages as well as other supportive interventions (e.g. providing the right tools to make compliance easier).

Two other categories represented in the Braithwaite model engage in deliberate non-compliant behaviour in order to gain benefit to which they are not legally entitled. For offenders in these groups enforcement is required to achieve deterrence, and may be required ongoing as these may become repeat offenders. For the purpose of this report we treat this as a single group noting that the interventions required for this group are largely compliance oriented but note where some messaging embedded within enforcement notices and relationship building can work alongside enforcement to potentially improve efficacy of such traditional interventions.

Appendix C: Social Cognitive Behaviour and The Theory of Planned Behaviour

A lack of theoretical grounding in the design of behavioural change interventions was a deficiency identified early in the development of the behaviour change literature (Michie et al. 2011), in environmental matters in Australia (Kidd et al. 2019), and remains present globally in behaviour change literature and in studies of fisher behaviour (Andrews et al. 2021).

There are over 60 behavioural theories in the behaviour change literature for researchers to select from for their studies (Davis et al. 2015), the most common being theory of planned behaviour (Ajzen 1991), norm activation theory, and more contemporarily 'nudge' theory (Thaler & Sunstein 2008).

Social Cognitive Theory highlights the need to consider a range of social and environmental factors, emphasising that individuals do not make decisions in a vacuum, their behaviours are fundamentally learned from and influenced by other people (Bandura 1998). Therefore, as well as studying individuals, one also needs to understand social context and how people interact and influence each other and behave in group settings (described in many models as the construct of social influence). These understandings can help to guide the development of policies or interventions designed to alter behaviours (e.g. persuasive communication, identification, and promotion of positive role models).

A common socio-psychological model in the literature on social cognitive behaviour is the Theory of Planned Behaviour (TPB) (Ajzen 1991) (see Figure 12). The TPB proposes components that predict the performance of a behaviour, namely: the individual's attitudes toward the behaviour, subjective norms (the degree to which one feels that significant others think one should perform the behaviour), social norms (customary codes of behaviour in the social group), perceived power (factors that may facilitate or impede the performance of the behaviour) and perceived behavioural control (the degree to which one feels able to perform the behaviour/has control over it) (Beedell & Rehman 2000; Burton 2004). The TPB extended the Theory of Reasoned Action by adding perceived behavioural control to remove the uncertainty created by the assumption of individual volition (the ability for an individual to decide on or commit to a course of action). Perceived behaviour control is a component of self-efficacy theory, which derives from social cognitive theory. Data for the TPB model is collected through surveys with questions aligning with the components of the TPB and then tested against either stated intentions to act or observed probability of acting. The TPB has been applied in multiple studies and across disciplines with reported predictive power (Hagger et al. 2002).
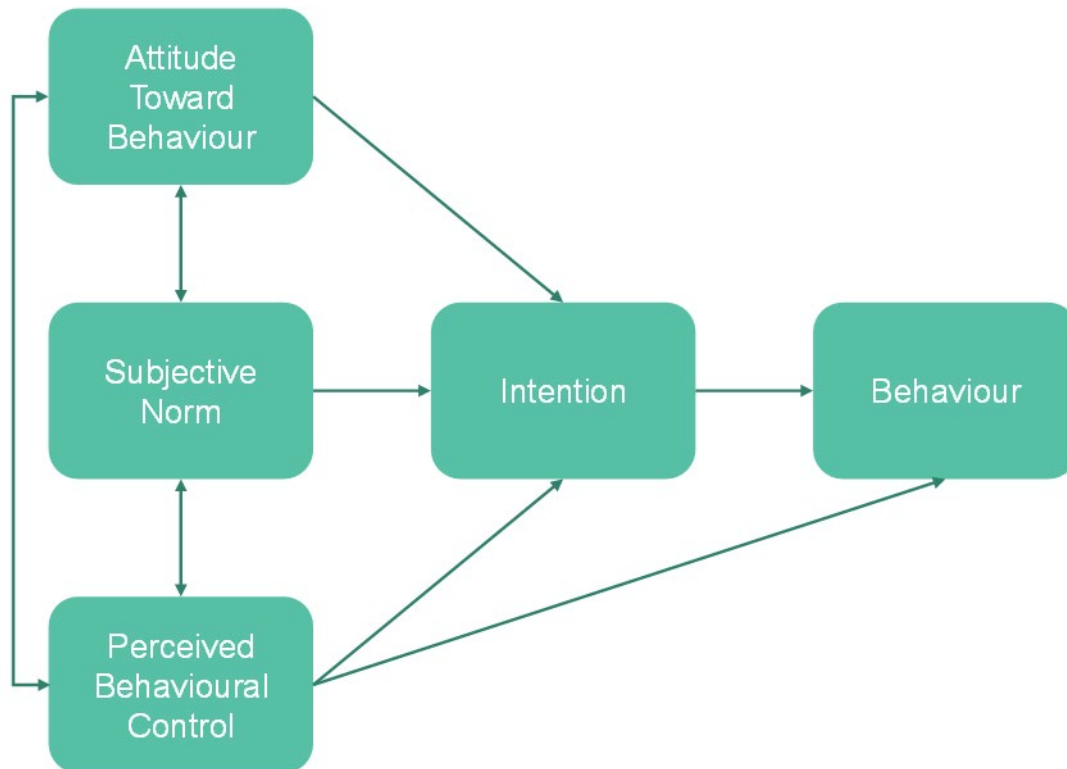
Figure 12. Theory of Planned Behaviour (adapted from Ajzen (1991))

The theory of planned behaviour provides the theoretical basis by which we will develop a logic base or 'theory of change' to identify interventions or possible leverage points for our target audiences within the recreational fishing community to enhance compliance with marine park zoning rules. The ways in which we can influence human behaviour are many: for example, common interventions rely upon law, regulation, and financial incentives. Laws, regulations, and rules cause behaviour change via mandates and prohibitions. Market-based price tools such as taxes and subsidies induce economically rational behaviour change by manipulating costs and benefits. A rational agent would respond to these incentives. However, for behaviours that deviate from rational predictions and cannot be (adequately) addressed by these, we need other approaches; one that is evidence-based and increasingly popular is nudging.

Appendix D: The Theory of Change

A theory of change or logic chain reveals the basic logic between who an individual is, how aware they are of a problem, their intended choices, and ultimately their actual behaviour and its impacts upon a system. A theory of change reveals assumptions at each step and in doing so provides a clear basis by which to measure and evaluate the validity of these. The resulting model will depict the possible relationships that exist between these elements, and how these could influence or contribute to impacts on the marine environment (Margoluis et al. 2013; Fraser et al. 2019). For this project, specifically, given the choice of theoretical basis is TBP+ and we are using nudge theory to identify influence factors, the theory of change is structured around individual attributes, awareness of the issue, intention to act, actual observed behaviour, and ultimately outcomes and impacts on the reef (Figure 13).

The intention of the theory of change is then to clearly articulate effective ways to generate change on target compliance behaviours, motivations and actions by recreational fishers,

that would bring positive impacts to the marine environment (see (Hofman et al. 2020) for an example of conservation behaviours to protect the reef).

Figure 13. Tailored theory of change where the core results chain is based on theory of planned behaviour components with possible measures and indicators embedded.
Yellow points in the chain are components that could be influenced based on interventions (either nudge, messages, or compliance). Blue factors are those that capture individual traits. Orange are environmental factors.

Appendix E: Nudging

The idea of nudges as behavioural drivers was first introduced in the book 'Nudge' by Nobel laureate Richard Thaler and Cass Sunstein (Thaler & Sunstein 2008). A nudge policy is one where the decision context is designed based on behavioural science insights to gently steer people's behaviour in a particular direction. In terms of implementation, nudges are lighter in touch compared with policies which mandate or prohibit, and lower in cost compared to price-based tools such as subsidies. Nudges do not force or remove choice – instead, they appeal to people's psychology (their cognitive processes, heuristics, biases) by making it easier and more attractive for people to adopt the recommended behaviour. To nudge effectively requires policymakers to be aware of how people actually behave and the psychology underlying that behaviour, as opposed to how people are assumed to behave as a rational response to traditional policy tools. For example, some fishers may not renew their fishing licences because present bias has caused them to procrastinate. As people tend to stick to the status quo (status quo bias), a nudge can leverage this insight to address this problem by changing the default, so licences are automatically renewed unless fishers opt out. The nudge makes renewal of licences easier, but fishers still retain choice as they can opt out if they want to. Changing the default is cheaper to implement than monitoring compliance. Nudges have been further reviewed and recommended specific to recreational fishing compliance (Mackay et al. 2018).

A nudge intervention happens when the decision context is designed based on behavioural science insights to gently steer people's behaviour into a certain direction. In terms of implementation, nudges are lighter in touch compared to policies which mandate, prohibit or penalise, and lower in cost compared to price-based tools such as subsidies. Nudge

interventions do not remove choice; instead nudges appeal to people's psychology (e.g., cognitive processes, heuristics, biases) by making it easier and more attractive for people to adopt the recommended behaviour. Nudges can be interventions such as messages or marketing campaigns, providing tools such as navigational aids or apps, embedding alerts or notices within tools, and much more.

Effective nudging requires an awareness of how people *actually* behave (as opposed to assumed behaviour intentions as a rational response to traditional policy tools). The gap between actual and intended behaviours can be explained by the dual- process model of cognition. This recognises that people have two modes of processing information: Systems 1 and 2. In their everyday lives, people mostly utilise System 1, saving their limited cognitive abilities of System 2 for more complex tasks. As a result, people are often biased against tasks that require deliberate effort.

Another dimension overlapping with the distinction between Systems 1 and 2 is that of "hot" (emotional) and "cold" (unemotional) cognition. A nudge classification model can be constructed based on these two dimensions. We use nudges to address the biases originating in our System 1. This can be done in various ways displayed in Figure 14.
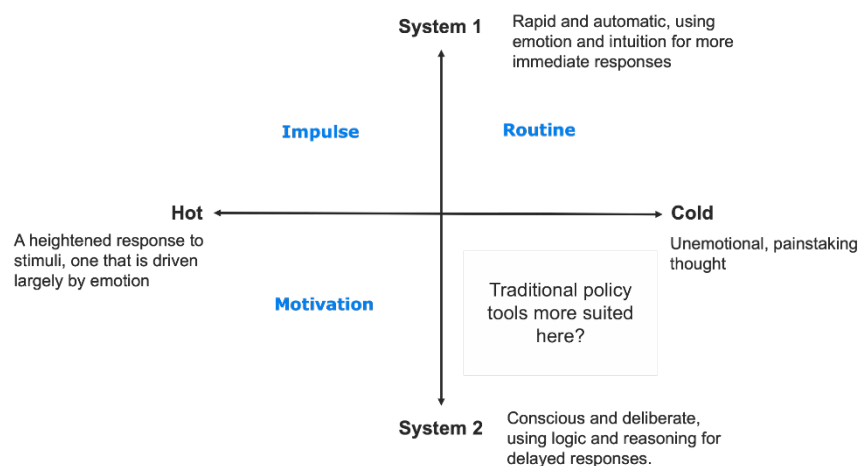
Source: Codagnone et al. in the BE Guide (2014)

Figure 14. Nudge classification across two dimensions: system 1, 2 and hot, cold. Adapted from (Codagnone et al. 2014)

As nudges retain choice, they are suited for situations where there is a gap between intended and actual behaviour. Nudges help people close that gap. In the above example, the nudge will be suitable for those fishers who intend to renew their licences but have somehow been prevented by their psychology (e.g. procrastination) from doing so. However, it will not be suitable for those fishers who have made a calculated decision not to have a valid licence and have no intention to renew. A heavier hand of formalised mandates and penalties is needed for such situations.

We use the Nudge classification in Figure 14 to consider the types of nudges available for the case of compliance of recreational boating and fishing compliance in marine parks. Characterizing the two dimensions and which audience you are working with is key to applying this theory:

- **Purposeful:** In Quadrant 3, the mind is in System 2 with cold cognition, resulting in deliberate and calculated decisions as expected from a perfectly rational person. Here there is no gap between planned and intended behaviour. This is not nudging territory – rely on your compliance tools such as monitoring and fines.

- **Impulse:** In Quadrant 1, the mind is in System 1 with a hot cognitive state, causing people's behaviours to be driven by typical *impulsiveness*. Here we use nudges to activate our System 2 to help bring our System 1 under control, to de-bias. For example, loud ringing or beeping alerts on fishing apps that fishers caught in the moment need to actively turn off when they stray into Green (No Fishing) Zones.
- **Routine:** In Quadrant 2, the mind is in System 1 but with cold cognition, resulting in the fairly *routine* situations where people are exercising judgement, but their judgement is affected by biases stemming from System 1. Here we use nudges to play System 1's biases against each other, to counter-bias. For example, to counter a fisher's present bias which may cause them to procrastinate in terms of renewing their fishing licence, we can leverage their status quo bias where the default is that their licence is automatically renewed unless they opt-out.
- **Accidental:** In Quadrant 4, although the mind is in System 2, it is experiencing a hot cognitive state, resulting in weakness of will (lack of self-control) to act in the intended manner. Here we use interventions which can *motivate* people to act in the way they know is right. For example, using persuasive messaging which appeals to their ego and morals to encourage fishers to fish the right zone.

Appendix F: Survey questionnaire

The survey is shown below, followed by a diagram mapping the survey questionnaire to the adapted Theory of Planned Behaviour used for this project.

Block: Information Sheet (1 Question)
Standard: Informed Consent (1 Question)

Branch: New Branch
    If
        If I consent to taking part in this survey. No Is Selected

EndSurvey: Advanced

Standard: Your Fishing Location (1 Question)

Branch: New Branch
    If
        If As part of this research, we are surveying recreational fishers in a number of locations in Austr... I don't fish in any of the above areas, but I like fishing at this location (please specify) Is Selected

EndSurvey: Advanced

Branch: New Branch
    If
        If As part of this research, we are surveying recreational fishers in a number of locations in Austr... I fish between Mindarie and Two Rocks, Western Australia Is Selected

> **Block: Satisfaction with Fishing Location - Two Rocks, WA (5 Questions)**

> **Branch: New Branch**
>   **If**
>   **If Have you been fishing recreationally in saltwaters between Mindarie and Two Rocks, Western Austra... No Is Selected**

> **EndSurvey: Advanced**

Branch: New Branch
    If
        If As part of this research, we are surveying recreational fishers in a number of locations in Austr... I fish in the Geographe Bay area, Western Australia Is Selected

> **Block: Satisfaction with Fishing Location - Geographe Bay, WA (5 Questions)**

> **Branch: New Branch**
>   **If**
>   **If Have you been fishing recreationally in saltwaters around Geographe Bay, Western Australia, in th... No Is Selected**

> **EndSurvey: Advanced**

Branch: New Branch

If
    If As part of this research, we are surveying recreational fishers in a number of locations in Austr... I fish between Bundaberg and Cape York, Queensland Is Selected

Block: Satisfaction with Fishing Location - Bundaberg to Cape York, Qld (5 Questions)

Branch: New Branch
    If
        If Have you been fishing recreationally in saltwaters between Bundaberg and Cape York, Queensland, i... No Is Selected

EndSurvey: Advanced

Standard: Background Info (10 Questions)
Standard: Fishing to Connect with Others (8 Questions)
Standard: About You & Your Thoughts About Fishing (7 Questions)
Standard: Navigating Saltwater Fishing (8 Questions)
Standard: Prize Draw (1 Question)

Branch: New Branch
    If
        If Would you like to enter the prize draw, obtain a copy of the research report and/or be considered... Yes Is Selected

EndSurvey: Advanced

EmbeddedData
    rstatus = Complete

Page Break ─────────────────────────

Q1 "Evaluation of recreational fishing behaviour, use, values and motivations that relate to compliance".

You are invited to take part in a research project about your participation in, and enjoyment of, recreational fishing. The aim of this project is to understand more about you, what you love about fishing and what makes it important to you. Your input will provide a current perspective of recreational fishers as users of Australia's marine environment and help guide the development of improved management and communication practices for marine park authorities.

You are asked to participate in an online survey and respond to a series of questions. The survey takes approximately 10 minutes to complete.

By completing the survey you have the option of entering our prize draw. The prize draw will provide a chance to win one of 4 x $50 vouchers to the local bait and tackle store of your choice. You will also be given the opportunity to register your interest in taking part in focus groups about your fishing experiences in greater detail later in the project.

Your consent to participate in this research is indicated by answering the question below, and by the completion and submission of the attached survey.

Your contact details for the prize draw will be collected and stored separately from the survey data, so that there is no way to link your email address to your survey responses, ensuring the anonymity of your survey responses.

This project has been funded by the Australian National Environmental Science Program (NESP), and in Queensland, co-founded by the Great Barrier Reef Marine Park Authority.

Taking part in this survey is completely voluntary and you can stop taking part in the survey at any time without explanation or prejudice. However, please note that as this is an anonymous survey, if you wish to withdraw from the survey during or after completing the questionnaire, data already collected cannot be deleted.

Your anonymised responses will be shared with the research team and with the funding bodies. Common responses, common themes and a summary of findings will be shared back to funding bodies, to inform and enhance delivery of future marine management programs.

The data from the study may be used in research publications, reports, and journal articles published by the research team consisting of researchers from James Cook University, University of Tasmania, and University of Western Australia. You will not be identified in any way in any of these publications.

You will be able to request a summary of the results towards the end of 2023 if you wish to be kept informed on the project results. Your response is important to the research team. Thank you in advance for participating in this survey.

If you have any questions about the research, please contact the Principal Investigator Associate Professor Vanessa Adams, College of Geography, Planning & Spatial Sciences, University of Tasmania, on Phone (3) 62261905 and at Email: vm.adams@utas.edu.au If you have any concerns regarding the ethical conduct of the study, please contact: Human

Ethics, Research Office James Cook University, Townsville, Qld, 4811 Phone: (07) 4781 5011 (ethics@jcu.edu.au).

Your help is much appreciated! Please feel free to share the survey link if you have friends, family and fellow recreation fishers who you think would like to participate.

Please Note: As a panel participant, you may receive a small incentive for your time from the panel organisation in a variety of forms. The researchers do not have any control over the panel organisers incentive distribution.

Please click on 'NEXT' to start the survey.

End of Block: Information Sheet

Start of Block: Informed Consent

Q2 I consent to taking part in this survey.

○ Yes

○ No

End of Block: Informed Consent

Start of Block: Your Fishing Location

Q3 As part of this research, we are surveying recreational fishers in a number of locations in Australia. Please indicate which location is relevant to the majoirty of your recreational fishing activities?

○ I fish between Bundaberg and Cape York, Queensland

○ I fish in the Geographe Bay area, Western Australia

○ I fish between Mindarie and Two Rocks, Western Australia

○ I don't fish in any of the above areas, but I like fishing at this location (please specify)

_____

End of Block: Your Fishing Location

Start of Block: Satisfaction with Fishing Location - Two Rocks, WA

Q4 Have you been fishing recreationally in saltwaters between Mindarie and Two Rocks, Western Australia, in the past 12 months?

○ Yes

○ No

Q5 On how may separate days have you been recreationally fishing in saltwaters between Mindarie and Two Rocks, Western Australia in the past 12 months?

○ 1 - 4 days

○ 5 - 14 days

○ 15 - 30 days

○ 31 - 90 days

○ More than 90 days

Q6 How satisfied are you with the quantity of fish caught during your saltwater fishing between Mindarie and Two Rocks, Western Australia, in the past 12 months?

○ Extremely dissatisfied

○ Somewhat dissatisfied

○ Neither satisfied nor dissatisfied

○ Somewhat satisfied

○ Extremely satisfied

Q7 How satisfied are you with the quality of fish caught during your saltwater fishing between Mindarie and Two Rocks, Western Australia, in the past 12 months?

○ Extremely dissatisfied

○ Somewhat dissatisfied

○ Neither satisfied nor dissatisfied

○ Somewhat satisfied

○ Extremely satisfied

Q8 How satisfied are you with the environmental management of the saltwaters you fished around Two Rocks, Western Australia, in the past 12 months?

○ Extremely dissatisfied

○ Somewhat dissatisfied

○ Neither satisfied nor dissatisfied

○ Somewhat satisfied

○ Extremely satisfied

End of Block: Satisfaction with Fishing Location - Two Rocks, WA

Start of Block: Satisfaction with Fishing Location - Geographe Bay, WA

Q9 Have you been fishing recreationally in saltwaters around Geographe Bay, Western Australia, in the past 12 months?

○ Yes

○ No

Q10 On how may separate days have you been recreationally fishing in saltwaters around Geographe Bay, Western Australia, in the past 12 months?

○ 1 - 4 days

○ 5 - 14 days

○ 15 - 30 days

○ 31 - 90 days

○ More than 90 days

Q11 How satisfied are you with the quantity of fish caught during your saltwater fishing around Geographe Bay, Western Australia, in the past 12 months?

○ Extremely dissatisfied

○ Somewhat dissatisfied

○ Neither satisfied nor dissatisfied

○ Somewhat satisfied

○ Extremely satisfied

Q12 How satisfied are you with the quality of fish caught during your saltwater fishing around Geographe Bay, Western Australia, in the past 12 months?

○ Extremely dissatisfied

○ Somewhat dissatisfied

○ Neither satisfied nor dissatisfied

○ Somewhat satisfied

○ Extremely satisfied

Q13 How satisfied are you with the environmental management of the saltwaters you fished around Geographe Bay, Western Australia, in the past 12 months?

○ Extremely dissatisfied

○ Somewhat dissatisfied

○ Neither satisfied nor dissatisfied

○ Somewhat satisfied

○ Extremely satisfied

End of Block: Satisfaction with Fishing Location - Geographe Bay, WA

Start of Block: Satisfaction with Fishing Location - Bundaberg to Cape York, Qld

Q14 Have you been fishing recreationally in saltwaters between Bundaberg and Cape York, Queensland, in the past 12 months?

○ Yes

○ No

Q15 On how may separate days have you been recreationally fishing in saltwaters between Bundaberg and Cape York, Queensland in the past 12 months?

○ 1 - 4 days

○ 5 - 14 days

○ 15 - 30 days

○ 31 - 90 days

○ More than 90 days

Q16 How satisfied are you with the quantity of fish caught during your saltwater fishing between Bundaberg and Cape York, Queensland, in the past 12 months?

○ Extremely dissatisfied

○ Somewhat dissatisfied

○ Neither satisfied nor dissatisfied

○ Somewhat satisfied

○ Extremely satisfied

Q17 How satisfied are you with the quality of fish caught during your saltwater fishing between Bundaberg and Cape York, Queensland, in the past 12 months?

○ Extremely dissatisfied

○ Somewhat dissatisfied

○ Neither satisfied nor dissatisfied

○ Somewhat satisfied

○ Extremely satisfied

Q18 How satisfied are you with the environmental management of the saltwaters you fished at between Bundaberg and Cape York, Queensland, in the past 12 months?

○ Extremely dissatisfied

○ Somewhat dissatisfied

○ Neither satisfied nor dissatisfied

○ Somewhat satisfied

○ Extremely satisfied

Q19 Please indicate your gender.

○ Male

○ Female

○ Non-binary / third gender

○ Prefer not to say

Q20 Please indicate your age.

○ 18 to 25 years

○ 26 to 41 years

○ 42 to 57 years

○ 58 to 67 years

○ 68 to 76 years

○ 77+ years

Q21 What is your residential postcode?

_____

Q22 Please indicate your highest level of education.

○ Year 10 or equivalent

○ Year 12 or equivalent

○ Technical, trade or vocational qualification

○ Undergraduate university degree

○ Postgraduate university degree

○ Prefer not to say

Q23 Do you identify as being of Aboriginal and/or Torres Strait Islander origin?

☐ Yes, Aboriginal

☐ Yes, Torres Strait Islander

☐ No

Q24 Indicate your level of agreement with the following statements: Recent increases in living expenses have impacted my fishing trips by,

	Strongly Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
decreasing the number of fishing trips that I can afford to make	○	○	○	○	○
decreasing the number of fish I catch and release as I take more home to eat	○	○	○	○	○
decreasing how far I travel to go fishing, (and or how much travelling I do if boating) due to the cost of fuel	○	○	○	○	○
I go without other things now to ensure I can afford to go fishing	○	○	○	○	○

Q25 Since COVID-19, I go saltwater fishing:

○ Lots less

○ A little less

○ About the same

○ A little more

○ Lots more

Q26 How do you mostly go saltwater fishing?

○ I mostly fish from my own boat

○ I mostly fish on other people's boats

○ I fish from a boat and from the shore roughly the same amount each

○ I mostly fish from the shore (includes from a beach, jetty, wharf etc)

Q27 Which gear do you use when you go saltwater fishing?

☐ Trolling

☐ Line fishing other than trolling

☐ Spearfishing

☐ Hand capture (e.g., for crayfish)

☐ Crab pots or scoop

☐ Other   (Please   specify)
_____

X

Q28 Of these types, which is the fishing gear you use most often when saltwater fishing?

○ Trolling

○ Line fishing other than trolling

○ Spearfishing

○ Hand capture (e.g., for crayfish)

○ Crab pots or scoop

○ Other (Please specify) _____

End of Block: Background Info

Start of Block: Fishing to Connect with Others

Q29 Did you learn to fish from your parents or another close family member (e.g., grandparents)?

◯ Yes

◯ No

◯ Unsure

Q30 Who do you usually go saltwater fishing with?

☐ Friends

☐ Family - adults

☐ Family, - children under 18 years

☐ Fishing club members

☐ I prefer to fish alone

☐ Other (please state) _____

Q31 Are you a member of any fishing clubs, or other types of clubs or associations?

◯ Yes, I am a fishing club member

◯ No, I am not in a fishing club, but I am in other clubs or associations (please state) _____

◯ No, I am not a member of any clubs or associations

◯ Prefer not to say

Q32 On which social media platform/s do you like to share your fishing experiences with others?

☐ YouTube

☐ Facebook

☐ Instagram

☐ LinkedIn

☐ WhatsApp

☐ TikTok

☐ I do use social media, but I don't use it for sharing fishing experiences with others

☐ I don't use social media

☐ Other (please state) _____

Q33 Do you have a favourite fishing television show?

☐ Fishing Australia

☐ AFN Fishing Show

☐ Creek to Coast

☐ Hook, Line & Sinker

☐ About Fishing

☐ Gone Fishin

☐ Fishflicks

☐ Fishing Adventure

☐ I watch fishing show/s, but don't have a favourite

☐ I don't watch fishing shows

☐ Other (please state) _____

Q34 Do you have a favourite fishing brand of clothing, fishing gear and/or vessels?

☐ fishing clothing _____

☐ fishing gear _____

☐ fishing vessels (boat, kayaks etc) _____

☐ I don't have any favourite fishing brands

Q35 What are your favourite hobbies, interests or pastimes when you aren't fishing?

○ boating

○ snorkelling

○ scuba diving

○ waterskiing

○ playing team sports e.g. football, cricket, netball, soccer

○ running

○ skydiving

○ reading

○ photography

○ horse riding

○ camping, bushwalking, being outdoors

○ Other (please state) _____

Q36 What is your preferred pet to own?

○ Cat

○ Dog

○ Birds (aviary or hand raised)

○ Aquarium fish

○ Horse

○ Reptiles (snakes, lizards etc)

○ Other _____

○ None, I would rather not own a pet

Q37 I would describe myself as someone who,

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
is open to trying new things	○	○	○	○	○
is very creative	○	○	○	○	○
likes tackling new challenges	○	○	○	○	○
likes thinking about abstract concepts	○	○	○	○	○

Q38 Other people would see me as someone who,

	Strongly Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
pays attention to detail	○	○	○	○	○
enjoys a set schedule	○	○	○	○	○
spends time preparing	○	○	○	○	○
finishes important tasks right away	○	○	○	○	○

Q39 I think that I am someone who,

	Strongly Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
finds it easy to make new friends	○	○	○	○	○
feels energised when around other people	○	○	○	○	○
enjoys being the center of attention	○	○	○	○	○
sometimes says things before thinking about them	○	○	○	○	○

Q40 I believe that I can be described as,

	Strongly Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
enjoys helping and contributing to the happiness of other people	○	○	○	○	○
feels empathy and concern for other people	○	○	○	○	○
assist others who need help	○	○	○	○	○
cares about others	○	○	○	○	○

Q41 I can be described as someone who,

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
deals well with stress	○	○	○	○	○
rarely feels sad or depressed	○	○	○	○	○
is very relaxed	○	○	○	○	○
doesn't worry much	○	○	○	○	○

Q42 What do you value most about fishing?

	Not Important at all	Slightly Important	Important	Fairly Important	Very Important	No Opinion
relaxing/unwinding	○	○	○	○	○	○
spending time outdoors/in nature	○	○	○	○	○	○
spending time on my own	○	○	○	○	○	○
spending time with family	○	○	○	○	○	○
spending time with friends	○	○	○	○	○	○
competing in fishing competitions	○	○	○	○	○	○
experiencing physical and mental challenges due to weather, terrain, or the process of catching fish	○	○	○	○	○	○
catching fresh fish for myself and others to eat	○	○	○	○	○	○
catching fish to release	○	○	○	○	○	○
being able to focus on fishing and not think about other things	○	○	○	○	○	○
learning about nature/ the environment	○	○	○	○	○	○
having conversations with others about topics I wouldn't usually discuss	○	○	○	○	○	○
getting exercise	○	○	○	○	○	○
Other (please state)	○	○	○	○	○	○

Q43 Which of the following is most important to you in having a good fishing trip?

○ To catch lots of fish

○ To catch big fish

○ To catch a particular species of fish

○ To fish remote locations

○ To fish in new places

○ To ensure everyone else on the trip has a good time

○ To spend more time fishing

○ Other (please state) _____

Q44 How do you rate your knowledge of recreational fishing in marine parks and their different marine zones?

	Strongly Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I have a good knowledge of how to navigate marine parks and marine zones while fishing	○	○	○	○	○
I have a good understanding of the marine park maps and zoning requirements and plan where I go fishing before my trip	○	○	○	○	○
I have a good understanding of the marine park maps and zoning requirements, but don't tend to plan my fishing spots before I go	○	○	○	○	○
I would like to develop my skills in using technology, like apps, to help me know exactly where I am in the marine zone while fishing	○	○	○	○	○
I would like to learn more about how I can easily know I am in a certain marine park zone when fishing as I am sometimes unsure	○	○	○	○	○

Q45 What is your major challenge in knowing if you are in a marine park, or within a specific marine park zone within a marine park?

☐ I don't have a GPS on my boat

☐ I don't know how to use my GPS

☐ I am often out of internet service on my phone when I go fishing, so find it hard to access zoning maps or fishing App services

☐ I don't have a SatNav on my boat

☐ I am unsure if the marine park zoning applies to me

☐ I am new to fishing and I don't know much about marine parks and/or marine park zone requirements when fishing

☐ I don't have any issues knowing my location in marine parks and what fishing requirements are required in each marine park zone

☐ Other (please state) _____

Q46 Do you believe that leaving areas unfished within marine parks helps keep fishing sustainable for everyone now and into the future?

○ Definitely not

○ Probably not

○ Might or might not

○ Probably yes

○ Definitely yes

Q47 Indicate your level of agreement with the following statements,

	Strongly Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Website information has been helpful for me to know where I am allowed to fish, and where there are restrictions on fishing	○	○	○	○	○
People who are important to me think I should fish in the permitted marine zones	○	○	○	○	○
People who influence my behaviour think I should fish in the permitted marine zones	○	○	○	○	○
People whose opinions I value prefer that I fish in the permitted marine zones	○	○	○	○	○

Q48 I am aware of the different ways that recreational fishers can participate in protecting the environment of the marine park including to,

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
develop innovative practices to minimise by-catch of non-targeted species	○	○	○	○	○
assist with trialing new reef technologies	○	○	○	○	○
set voluntary protocols for recreational fishing through the Reef Guardians Fisher program	○	○	○	○	○
report on changes seen to the health of the marine environment e.g. sightings of rare species, coral damage	○	○	○	○	○

Q49 I am aware (either personally, through others, or from the news) that many actions are taken to keep marine parks safe for fishers and the environment including,

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
local police helping to keep shore areas safe by patrolling for crime	○	○	○	○	○
signs being erected at onshore fishing beach access points and boat ramps providing information on catch limits and zoning	○	○	○	○	○
vessel patrols are conducted to monitor activities in the marine park	○	○	○	○	○
surveillance flights being conducted to monitor activities in the marine park	○	○	○	○	○

Q50 How likely are you to recommend sustainable fishing practices (e.g. following bag and size limits, seasonal species restrictions) to family, friends and other recreational fishers?

○ 0

○ 1

○ 2

○ 3

○ 4

○ 5

○ 6

○ 7

○ 8

○ 9

○ 10

Q51 Is there anything else you would like to tell us about why you love to go fishing?

○ No thanks, I covered everything

○ Yes, I'd like to add... _____

End of Block: Navigating Saltwater Fishing

Start of Block: Prize Draw

Q52 Would you like to enter the prize draw, obtain a copy of the research report and/or be considered for further participation in our focus groups? If you click 'yes' for any of these options, you will be redirected to a separate survey site where you will be invited to leave your contact details for any of your 'yes' options of interest. This process is to ensure your anonymity from the survey question responses. Please note this prize draw is in addition to any panel incentives provided through your membership with PureProfile.

○ Yes

○ No

End of Block: Prize Draw

Appendix G: Focus Group Discussion

The focus group discussion was held online on Saturday 25th February with 8 participants, each provided with a $75 gift voucher as an incentive for participation. The discussion was based around a series of 4 activities:-

1. General discussion - Why do you love recreational fishing?
2. Creation of a customer journey map of typical fishing trip.
3. Generation of compliance perceptions matrix for other recreational fishers through apportioning into compliance pyramid categories.
4. Generation of compliance improvement projects and prioritization of same using individual and group think voting techniques.

Appendix H: Review of past campaigns

Dataset for Review

In this case study, the data for synthesis is supplied by GBRMPA (Table 7). The data consists of documentation relating to their compliance-based marketing campaigns conducted between 2018 and 2022; and included overviewing strategy document, assessment of copy and creatives for key campaign messages, social media sentiment analysis of select Facebook posts, market research and media agency campaign reports.

Table 7. Recreational Fisher Compliance Campaign Data – GBRMPA 2018 - 2022

Timing	Campaign
July 2018 and July 2019	Yachties trolling in Green Zones - survey
31 March - 12 May 2019	Protect Your Patch
14 June - 4 August 2019	Protect Your Patch / Green Zones
September 2019	Compliance Heat Maps
20 September to 27 October 2019	Protect Your Patch
4 December 2019 - 20 January 2020	Protect Your Patch / Illegal fishing green Zones-Compliance and Education Campaign
3 - 19 April 2020	Protect Your Patch
18 May - 27 June 2020	Eye on the Reef Zoning App advertising
Week of 18 Jan 2021	Bowling Green Bay Spit Education
December 2020	Survey Work – EOTR RJFMP
March to April 2021	GPS - Video Project (Educate recreational fishers on how to use their GPS units to display GBRMP Zoning)
April 2021	Promote the Eye on the Reef app
27 March to 15 May 2022	Know your zone
30 June 2022	Increasing Voluntary Compliance

To analyse the data supplied, academic and grey literature was sourced. We applied a conceptual and theoretical lens sourced from multiple social science disciplines, including social marketing, commercial marketing environmental economics and psychology, as common contributors when informing on behaviour change studies. As behaviour change research and its different contextual applications, such as recreational fisher behaviour, are globally emerging fields of study, this early literature development presents a challenge to stakeholders and researchers alike; the source of guidance is disparate with higher uncertainty of results until a sufficient breadth, depth and volume of studies is developed to

provide evidence-based guidance. A critical mass of literature also provides more reliable guidance stakeholder managerial decision making and wider policy agendas. In the interim, researchers draw from existing studies across a range of different disciplines' literature to help source studies best able to guide the development of a new body of work specific to recreational fisher behaviour change in Australia.

Theoretical Lens / Behaviour Change Approach

Successful, repeatable, scalable behaviour change requires a detailed strategic planning process. The behaviour change process takes time, is iterative and can be applied to short, medium and long-term stewardship goals. Of note, the literature identifies case study deficits relating to steps 2, 3, 4, 7, 8, and 9 (Figure 10); globally, and within the Australian coastal and marine ecosystem study applications.

The aim of this case study is to improve voluntary recreational fisher compliance with green zones (no-take) areas of the GBRMP. The purpose of this aim is to protect the short, medium, and long-term sustainability of fish stocks in the GBRMP. To achieve this 'common social good' requires communication to the general public through traditional and social media channels, commonly via the efforts of marketing and communications teams. Communications of this nature are at the core of social marketing literature, arising from the application and adaptation of commercial marketing practice to develop activities aimed at changing or maintaining positive and voluntary behaviour (Spotswood et al. 2012) for the benefit of individuals and society as a whole, including compliance to support environmental protection.

To assess how well a social marketing behaviour change intervention performs, social marketing benchmarking criteria (SMBC)(Andreasen, 1994; Andreasen 2002; French & Blair-Stevens, 2006). These criteria are presented with key questions for managerial guidance when developing or auditing campaigns:

Table 8. SMBC Criteria and Guidance Question

Nu	Criteria	Criteria Guidance Question
1	Behaviour	Does the campaign clearly identify the specific behaviour to be changed sing SMART goals principles (specific, measurable, attainable, relevant and timebound).
2	Customer Orientation	Does the campaign leverage a wide range of research methods and data types to fully identify and understand the target audience? Is the audience integrated as a key stakeholder of the campaign?
3	Theory	Is the campaign design and implementation expressly informed by relevant behavioural theory?
4	Insight	Have actionable insights been incorporated from the customer orientation research? Have these insights been piloted with the target audience?
5	Exchange	Has the campaign considered the cost/benefit of adoption and maintenance of the new behaviour for the target audience? Are there realistic incentives for the target audience to replace the behaviour?
6	Competition	Has the campaign adequately countered competition for the audience time, attention, and reason for behaving in the new way?
7	Segmentation	Has the campaign segmented their target audience and appropriately tailored the messaging, and message delivery, to each segment?
8	Methods Mix	Does the campaign use a range of marketing mix approaches, and not rely solely on one method (e.g. awareness)? Are the methods financially and practically sustainable for the campaign?

The SMBC integrates well with the 9-step behaviour change process in Figure 10 (Danton, 2008).

Together these tools show the practical design, implementation and audit requirements for successful behaviour change to support managing compliance-based campaigns. Therefore, both the behaviour change process in Figure 1, and SMBC bench marking criteria are used to frame the following discussion of the data synthesis.

Synthesis of Findings
Identification of target audience / audience orientation / segmentation
The campaign information provided stated that for the 2020 campaigns, the target market comprised of 25 year old to 65 year old males, within 50km of Queensland coastline. From 2021 campaigns onwards, the age of the stated campaign target audience was slightly refined to 18 year old to 50 year old males. Further inquiries with GBRMPA on the change in this target audience description suggest this target audience refinement was due to the use of compliance offender profile data as a proxy for target audience identification.

If we think of this in terms of theoretical frameworks, such as the compliance pyramid and nudge matrix (Codagnone et al. 2014), then there is a disconnect between the stated campaign target market and the target market demographic being reached through mass marketing campaigns; this target market does not necessarily equate to the compliance offender base demographics and may assist in explaining the underperformance reported in the campaigns results to date.

While there are some studies that provide additional variables and insight into recreational fishers in the GBRMP (*explored in further detail in the Milestone 3 report*), the reliance on demographics or any other variables of singular dimension is cautioned against, as it removes the dynamic, multidimensional nature of external and internal influences on fisher behaviour at a given point in time (Boonstra, 2016; Ulrich 2012; Whitehead 2011; Reeves, 2008; Weber 2007). COVID has presented a major disruption to communities, and it is unknown how this impact has deviated recreational fisher behaviour from the findings of prior studies.

The SMBC call for a deep and robust understanding of the target audience and how they live their everyday lives, and why they make the choices they do, generally and for any specific behaviours that may be subject to a campaign. More detailed information on the target audience will provide opportunity for segmentation, enabling tailored campaigns with enhanced messaging (copy and creative) focus to deliver the right content, to the right person, at the right place, in the right format, in the right language and on the right device. As part of segmentation, personas and/or archetypes can be developed for each relevant segment to support the design of campaign messages and optimise media and social media scheduling.

Observed in the campaign dataset and general postings of GBRMPA, was a general lack of *people* in creatives. This is important to address as it provides an opportunity to relationships with the target audience through use of representations in creatives, to build and reflect GBRMPA corporate partnerships, to humanise issues making them more relatable, and to leverage inter-Departmental compliance relationships through shared posting/pages where appropriate, see campaign asset examples in Appendix I and Appendix J.

Recommendations: To assist with refining the target audience and allowing for segmentation, further quantitative data collection is proposed using a range of questions to obtain demographic, socio-economic and psychographic (personality based) data from

recreational fishers, including perceived impacts of COVID on their recreational fishing behaviour.

With greater nuance in target market identification and segmentation, Campaign and general messaging increase focus on building underlying relationships with target audience, and increase obvious connections between marine environment – people – desired behaviours.

Use of Behavioural Theory
Identification of the behaviour to be targeted starts with the concise and purposeful naming of campaigns, allowing for a clarity of focus in the campaign brief for copy (campaign message creators) and creative designers to deliver the required campaign results.

Once the recreational fisher behaviour has been specifically determined for a campaign, the SMBC outlines interventions in terms of four behavioural domains to embody the nature of the behavioural change sought, namely campaigns to address the:
1. formation and establishment of the behaviour,
2. maintenance and reinforcement of the behaviour,
3. actual behaviour change, and
4. behavioural controls (based on voluntary / ethical principles).

As the majority of the GBRMPA campaigns were mass marketing and/or using broad target audience identification, there was not the level of behavioural specificity of the act to be changed, or underlying nature of the change sought, to further refine campaign messaging for the target audience.

In social marketing, behavioural theory domains are approached using four dimensions;
1. bio-physical,
2. psychological,
3. social, and
4. environmental/ecological.

There was limited evidence in the campaign data on the express or implied use of behavioural theory in the implementation of compliance campaigns within depth in the usage of the four behavioural domains or dimensions.

Recommendations: For this study, it is recommended to explore the use of campaign approaches based on the Theory of Planning Behaviour (TPB) (Ajzen, 1980). The TPB is recommended as well researched theory, widely and reliably applied across a range of contexts and industries, including compliance and marine estate management. The TPB allows for a wide range of internal and external factors to be considered on an individual and social level to predict behavioural outcomes. To utilise TPB in this case study, further data needs to be obtained to obtain the additional construct information for the TPD to be applied in this case study.

Following the SMBC call for integrated theoretical frameworks over repeat applications of preferred theory, and to augment the study design it is proposed that,
- the compliance pyramid be used to aid developing theories of change and tailored campaign messaging for distinguishable levels of the compliance pyramid arising from further survey and focus group data collections.
- a KASA (knowledge, ability, skills, awareness) framework be added (Freeman 1989; and marine application - Malaysian Govt; 2021) to assess recreational fisher self-perceptions, and

- theoretical development of recreational fishers' individual personal attributes can be supported through an application of the Big 5 Personality Traits Model (Sotto & Jackson, 2013).

Influence factors / Insight / Exchange

Insight refers to the exploration of motivations and values of the target audience that allow for the identification of key factors that influence particular behaviours, and subsequent leveraging in the campaign.

The campaign data provided was high level and did not provide details on any influence, insight or exchange factors considered in the design of the campaign or specific messaging. The concept of exchange analysis in social marketing refers to the process of identifying actual or perceived full costs of what the recreational fisher target audience foregoes in order to make the choice to voluntarily comply with marine zoning requirements and receive the resulting social benefit. These exchange values can be perceived or actual, and cover a wide range of costs, including physical, social, financial or time values.

There was no evidence of insight or exchange values in the campaign dataset. Where non-financial costs are identified, exchange values provide opportunities to employ choice architecture such as nudging (Thaler & Sunstein, 2008) to prompt behavioural change outcomes.

Recommendations: It is important to test all social marketing campaigns, and smaller interventions such as nudges, for unintended consequences. Any prototypes developed should be tested before full deployment and should be further monitored when deployed.

Campaign assets should leverage creatives that include people, specifically target audience and partners supporting campaign messaging.

Competition

Consideration of competition in a social marketing context, refers to understanding what competes for the target audiences time and attention that may impede the desired behaviour change, and then formulate strategies to minimise those factors.

There was no data indicating competition factors for recreational fishers were included in current GBRMPA campaigns.

Recommendation: To address this gap, quantitative data collection is needed from recreational fishers on internal factors (e.g. what else they do for pleasure, personal / social risk appetite) (Liu & Li, 2021). This quantitative data will need explanatory follow up in qualitative focus group discussions to support an understanding of competition from the recreational fisher perspective.

Intervention Type / Prototype / Methods mix

The campaign data provided can be categorised as mass marketing and is largely conducted through awareness campaigns, with some additional campaigns integrating an educational focus to improve recreational fishers' knowledge of marine park zoning requirements. There was also a post included in the social media Facebook data of the most popular post during the campaign data period, being a post advising of the upcoming patrols of compliance officers during set dates in a holiday period.

Feedback on specific campaign assets in the dataset is contained in Appendix J. Using the SMBC, there are five primary intervention types for social marketing behaviour change campaigns, as listed below. Highlighted in **green** are the types of campaigns that were

evidenced in the dataset. This classification demonstrates scope for future interventions to consider trialling alternative intervention types, according to their suitability for a specific target audience or segment. For example, in SMBC Type 1 we found evidence of campaign assets posted as informing the target audience (not encouraging), similarly educating (but not empowering in approach) etc. The focus was controlling / regulating, rather than relationship building and allowing increasing self-regulation behaviours.

1. informing / encouraging
2. educating / empowering
3. servicing / supporting
4. designing / adjusting environment
5. controlling / regulating

No campaign data was supplied regarding the prototyping or pilot testing of campaigns. A marketing research report did refer to the use of A/B Testing. However, a recommendation based on click-through rates needs to be carefully examined to avoid participation in click bait communications that erode target audience trust and the reputation of organisations.

The collection of further data is needed on barriers and enablers to compliance for recreational fishers, together with their communication and information preferences. It is proposed this be data be quantitatively collected via online survey, and qualitative explanation be provided through follow up discussions in focus groups with recreational fishers.

A range of communication channels, their locations and timings had been tried over the campaign data period 2018 to 2022, with fluctuating success. A consistent underperformer was social media postings. It is expected that refinement of the target audience and messaging would improve future social media campaign results. Effective us of social media for social marketing purposes relies on platform alignment and relationship building with the target audience, rather than commercial advertising style approaches. In accordance with mixed methods principles promoted by the SMBC, a number of data sources are being combined in this synthesis in this case study, including campaign reports, market research, compliance data and expert elicitation from GBRMPA compliance and communications staff.

Recommendations: The research design recommends the collection of existing campaign results datasets, and the collection of both quantitative survey data and qualitative focus group data. By mixing a range of data sources, approaches and data collections greater impact is expected when applied to behavioural interventions.

Different types of campaigns using additional relationship building self-regulation skills be trialled in future campaigns.

Continuous Monitoring & Measurement
Commercial campaign managers globally are struggling with metric selection and having a social marketing campaign does increase the complexity of these choices. Some data supplied demonstrated market research being conducted prior to campaign design, development and launch. However, there is inconsistency in the digital metrics selected in the different campaigns. Many of the campaign benchmarks are being set against Govt CPRs (cost-per-click) as a measure of efficiency of expenditure of the campaign and quasi-ROI. The metrics for the campaigns are also set against delivery of required slots to budget, and while expenditure is important to the campaign, there is also a need to be connected to the ultimate campaign objectives.

As the majority of the campaigns are digital and contain use of GBRMPA social media account use, continuous monitoring via active social listening through marketing software to

track keywords, hashtags and map networks. We are currently monitoring social media keywords, hashtags, and networks to test the viability of these monitoring methods.

Recommendation: Future campaigns be designed with consideration of appropriate short, medium and long-term metrics aligned with campaign behavioural goals, together with appropriate timeframes for review of same be established. For example, to support campaign management for short term goal metrics, we suggest the use of the Valid Metrics Framework (Figure 8. Excerpt from the Valid metric framework, based on social media metrics model (Jeffrey 2013).Figure 8). This framework is suited to shorter focused, single concept types of objectives of the nature of GBRMPA event-based campaigns. The first step is to turn to the Valid Metrics Framework and determine where the objectives fit into the framework. Choosing the appropriate metrics is, in turn, based on marketing objectives. Marketers cannot create measures with campaign value unless they first have measurable objectives and then map their metrics to the objectives. Examples of appropriate selections of metrics based on the Valid Metrics Framework for social media use is listed in Table 9 (Zahay et al. 2022).

Table 9. Valid Metrics Social Media Metrics (adapted from Zahay et al. 2022)

Exposure	Engagement	Influence	Impact	Advocacy
Quantitative	**Quantitative**	**Quantitative**	**Quantitative**	**Quantitative**

Page Visits
Visitors, Unique
  Visitors
Visits Per Channel
  (Source)
Reach
  Total Follower
    (Audience Count)
Opportunity-to-See
CPM (cost per
  thousand
  exposures)
	Repeat Visits
	Time Spent on Site
	Total Interactions
	  on Post/Page
	  Likes, Shares,
	  Comments
	Click-Throughs
	Number of
	  Followers,
	  Friends
	Total Audience of
	  All Shares
	Interaction with
	  Profile
	Use of Hashtags
	
	Qualitative
	Organic Account
	  Mentions
	People Talking
	  about Brand
		Links
		Association with
		  Brand Attributes
		Purchase
		  Consideration
		Likelihood to
		  Recommend
		
		Qualitative
		Sentiment
		  (Positive,
		  Neutral,
		  Negative)
		Net Promoter
		  Score
			New Subscribers
			Number of Referrals
			  to Website
			Number of Content
			  Downloads
			Number of App
			  Downloads
			Abandoned
			  Shopping Carts ($-$)
			Number of Sales
			  Leads
			Conversion Rate
			Sales
			Repeat Sales
			Purchase
			  Frequency
			Cost Savings
			
			Qualitative
			Satisfaction
			Loyalty
				Online Ratings
				Ratio Mentions to
				  Recommendations
				Number of Brand
				  Fans/Advocates
				
				Qualitative
				Content of
				  Ratings/Reviews
				Organic Posts by
				  Advocates
				Employee
				  Ambassadors

Feedback loops

Feedback loops on social marketing campaigns can be harnessed in a number of useful ways to inform overall communications strategy and individual or repeat social marketing campaigns though:

Social Media Marketing (SMM) monitoring

A connection is not evident between the campaigns and the remainder of the GBRMPA annual marketing period. A wholistic approach to GBRMPA communications strategy incorporating compliance would allow for the leveraging of relationship building and trust with the target audience.

Being able to actively monitor campaigns through comprehensive planning of clear SMART goals and selection of appropriate metrics closes the loop between individual campaigns and the overall compliance tasking, and the cascading nature of the wider GBRMPA communications and general agenda.

SMM responding on social media

> Several posts were examined that were contentious in content and text comment exchange, some to the point of requiring removal from the public newsfeed. Fear of negative feedback and/or not having measures in place to deal with negative feedback online is a major contributor to many regional businesses and SME generally not entering the online space and loosing valuable market opportunity (Mahony, 2020).

> Having a policy and simple escalation procedure for managing negative feedback online, together with conversational management training for staff is recommended to avoid reputational and target audience relationship damage in such circumstances (Newlands et al. 2021).

Campaign record keeping

Tracking of campaign reporting learning and recommendations as to which are being enacted and why some are not can be a useful way to internally of closing the loop and preparing for the next campaign strategy planning with an organisation.

Recommendation:
SMART goals principles be explicitly applied to SMM monitoring for all campaigns that utilise…………………

A clear escalation policy for handling negative feedback online be developed, together with staff training, and negative online feedback/handling be added to campaign evaluation processes.

Strategic planning documents be used to record and database all campaigns.

Evaluation & Impact
The campaigns have continued to be challenged in connecting campaign metrics with behaviour change outcomes. At a more granular level, from the campaign reports, the 6 sec grabs on YouTube are the most effective campaign asset included in the campaign data provided. This result is consistent with the general movement worldwide across social platforms with audiences favouring engagement with short form video.

The more recent (Nov 2021) campaign data supplied included flighting/publishing plans. It would be expected that this form of advance planning should be showing pain points in the campaign more clearly by end of 2022 with a comparative year being available.

The later Milestones in this project will address impact evaluation in greater detail, providing metrics and expected timeframes for change.

Appendix I: General GBRMPA Facebook Post Feedback Examples

Use of Peer-to-Peer Opinion Leaders & Storytelling to Connect with Target Audience
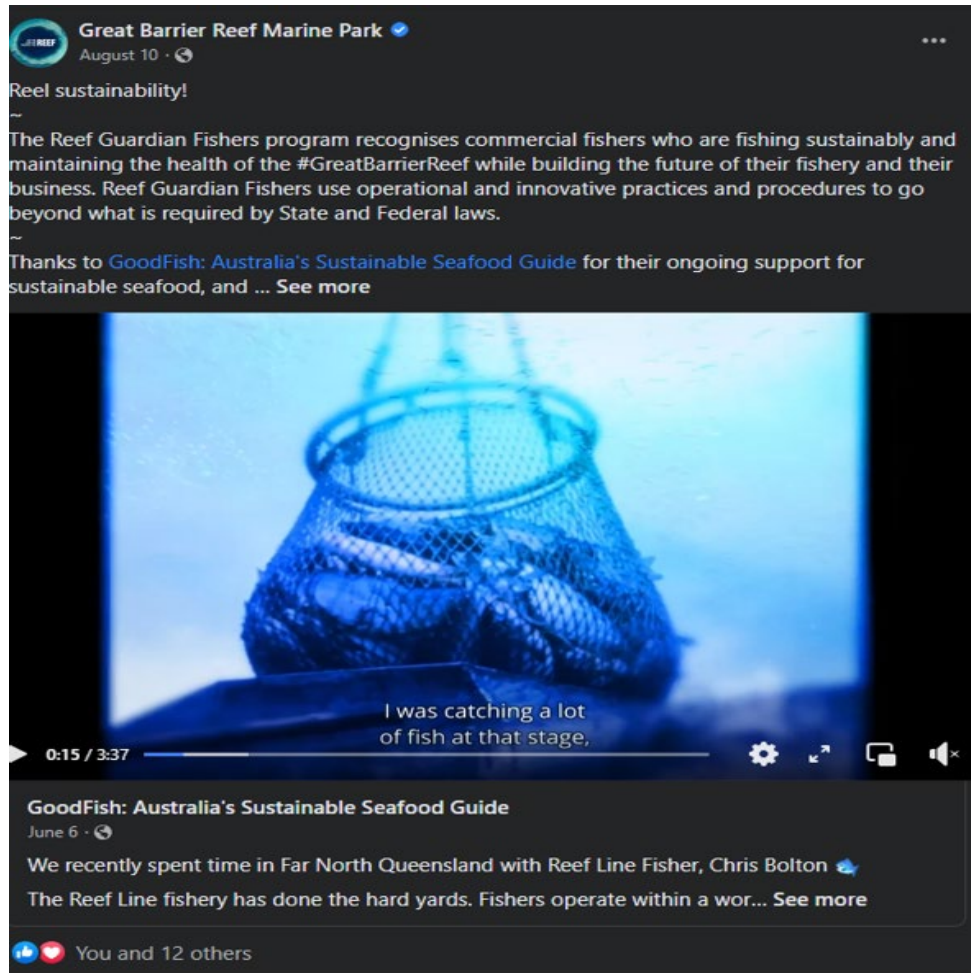
Figure 15. Example of GBRMPA post.

This is a very good example of messaging practice (

Figure 15). The post connected GBRMPA Compliance with a partner organisation of similar sustainability values. It uses a short form video, takes a story telling approach to enhance engagement, and the central character is an opinion leader in the target audience demographic. All of these factors are supported within the literature and improving relationship building, trust, and behavioural outcomes.

The presentation also uses short form video which is currently best practice to product higher levels of engagement and reach on the majority of social media platforms. If owned media, further value could be gleaned from this short form video by the creation of numerous other assets fort the GBRMPA marketing asset database for future campaigns e.g. flat posts, several shorter video clips. These smaller assets could then be used to create interactive posts to encourage active participation with the post such as different calculators and competitions, and two-way conversations with audience.

As discussed in our project meetings, more of this type of approach to GBRMPA compliance posting is recommended.

Emphasising Marine-Human Connections
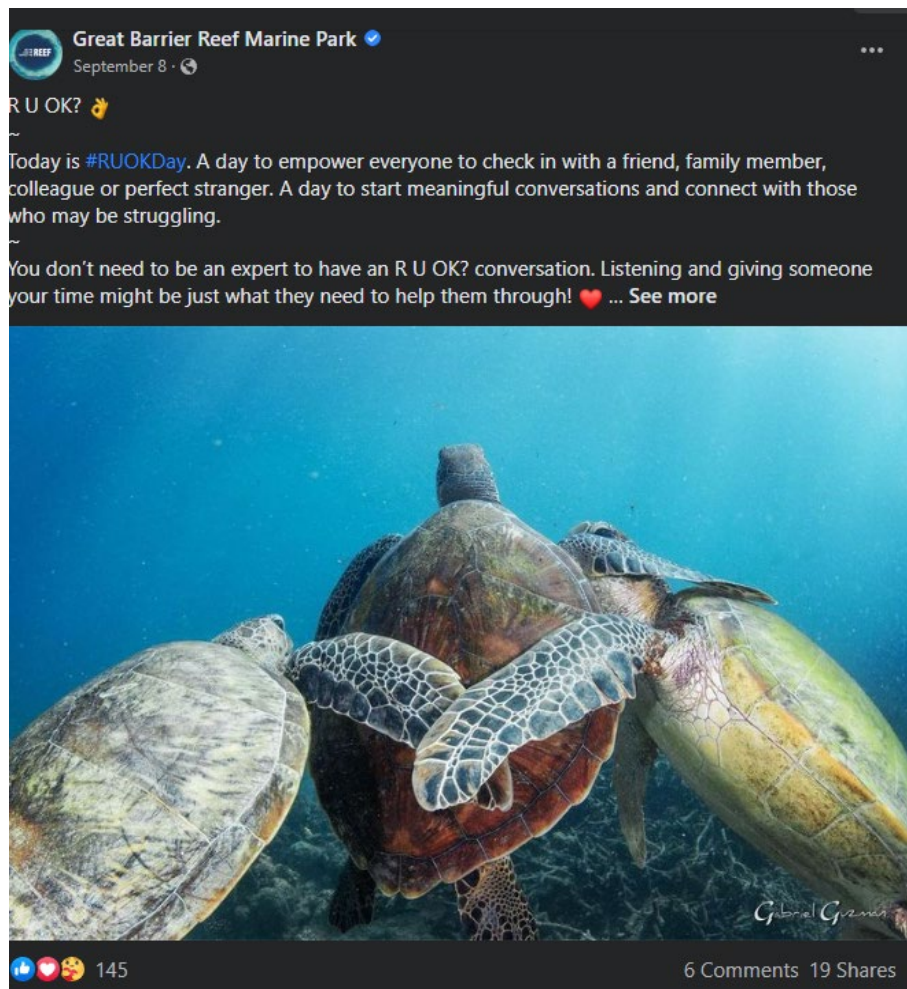
Figure 16. Second example GBRMPA post.

This is a very good example of another form of enhancing audience connection, through humanizing aspects of the animals and/or the environment (Figure 16). Turtles are also historically popular on social media. It is also relatable with one of the purposes of our project survey, to gain recognition and understanding of recreational fishing as providing more personal benefit than the act of catching fish.

As discussed in our project meetings, more of this type of approach to posting is recommended for general GBRMPA posting, creating social capital that GBRMPA compliance can tap into.

As with many of the posts observed on GBRMPA socials, there is a lot of text per post. The majority of social platforms only have space for @19 words when scrolling through a newsfeed. For the message to gain attention requires the visual, and a grab within that first 19 words, preferably with a directed action. Social Media Posts also perform better in the literature (academic and grey), where the text context is less than 20% of the post.

An example copy rewrite could read: 'R U OK? Check in with a friend.' And then add the link out to information with the partner organisation etc.

Leveraging competitions & engagement

It's #WorldPhotographyDay! 📷
~
So to celebrate, we want to acknowledge the visual story-tellers of the #GreatBarrierReef. If a picture can tell a thousand words, then their photographs can share millions of words to billions of people to join us to #SeeTheReef, #LoveTheReef and #ProtectTheReef. From a snap on your phone, to professional photographers, each camera and each photograph shares the message of the Great Barrier Reef to the world, so enjoy our virtual photo exhibiti... **See more**

You, SMARTadvice, Sea Spray Art by Kiera and 622 others   11 Comments 117 Shares
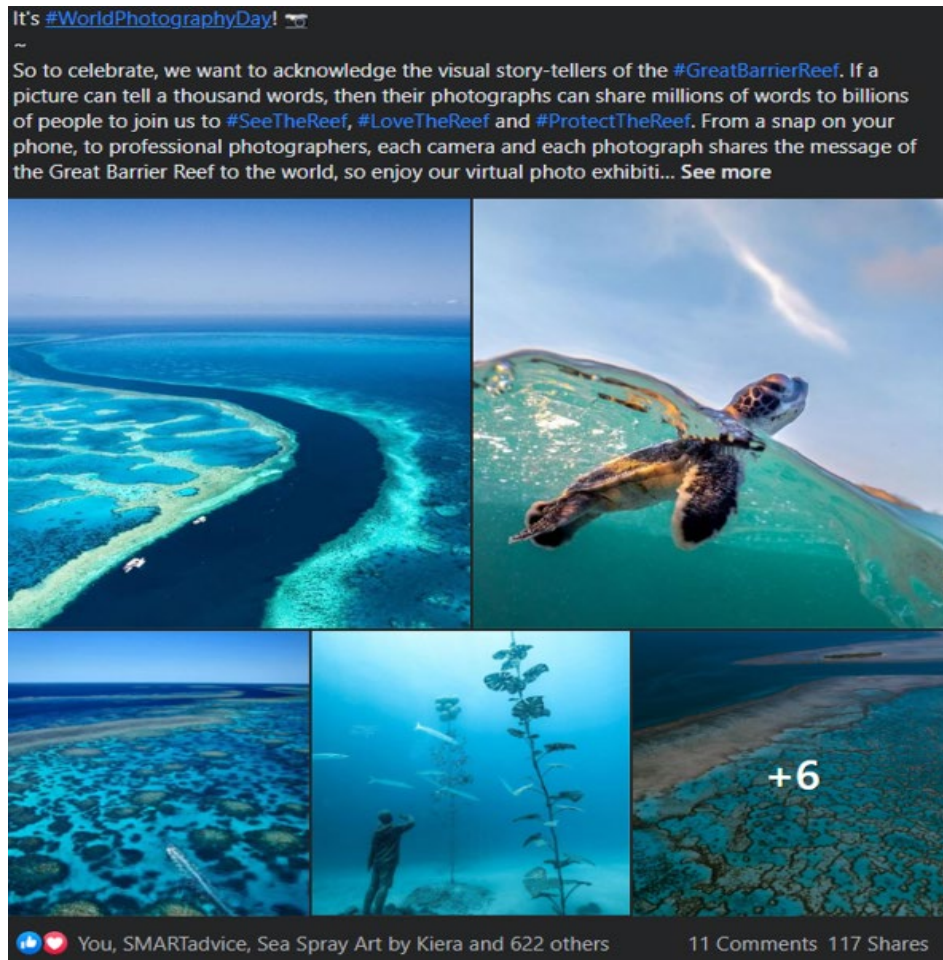
Figure 17. Third example GBRMPA post.

Running photographic competitions as an engagement tool is a tried and tested way of connecting with a target audience on social media.

This campaign example is a Facebook post (Figure 17). The underlying purpose of Facebook as a platform is to enhance social connections between people. To help close the loop on the above post, and better connect with people, the participants submitting photographs could be tagged or mentioned and thanked for their submission personally on each image comment. A CTA could also be added to the general public to vote on their favourite image to maximise message reach.

Also of note, is that the audience sought to be engaged here, are not necessarily the compliance relevant audience sought, highlighting the importance of a wholistic strategic approach to communications, clear target audience identification, platform alignment and the consideration of partnering with other recreational fishers' compliance-based accounts to assist in message reach.

Best practice for all social media platforms advises against the use of hashtags int eh body of post copy as a distraction to the reader. The algorithms in the majority of platforms preference hashtags at the end of posts, with varying maximums of 1 to 3-4 depending upon the platform (Facebook 's current recommendation is 2 or 3 # maximum), before the

algorithm also penalizes the post for reach purposes and can mistakenly mark as spam and reducing organic reach.

Figure 18. Fourth example GBRMPA post.

This example (Figure 18) was chosen to show an approach to including more people (in the case of compliance, rec fishers, and officers doing generally good things out of the water) in GBRMPA compliance postings.

The image is a young female, not a traditional demographic for cattle industry representation, wearing clothing that is relatable to the agricultural target audience and undertaking fishing activity popular amongst the target audience, but not directly related to their farming businesses. It takes a storytelling approach and develops trust through the providing the demonstrated relevance of the officer with infield skills. The post connects the waterways with the land through the use of the visual and helps farmers make that connection on a conscious and subconscious level (Newlands et al. 2021).

Appendix J: Specific Existing GBRMPA Compliance Campaign Asset Feedback Examples

General Insights from the synthesis of GBRMPA campaigns 2018 to 2022:

- campaigns are run individually and by geographic location, without being part of a cohesive overall annual short, medium and long-term well-articulated and documented strategy

- campaigns are challenged by not clearly identifying:

  1, who is the target audience,
  2. where to find target audience, and
  3. how to use data driven metrics to evidence the effectiveness of campaign objectives and actual behaviour change.

- campaigns have utilised wide ranging channels on an ad hoc basis with mixed results,

- campaigns have repeated messaging for brand awareness purposes with variability in traction,

- social media campaign elements have generally not delivered the desired results, and

- there is uncertainty in campaign reporting on the selection of appropriate click-based metrics and Govt benchmarks.

Discussions with GBRMPA have indicated that the current creatives are being repeatedly run-in campaigns for a variety of internal purposes, and these are sought to be retained for 'over time' measurements. On that basis, the following 'tweaks' to the creatives to enhance message clarity are supplied for consideration within that brief requirement.

Digital Programmatic Dataset Example

While a target market is being more clearly identified and located online, paid advertising is the alternative for message reach in current GBRMPA campaigns.

The below images were supplied from the GBRMPA Rec Fishing Campaign July 22-23.
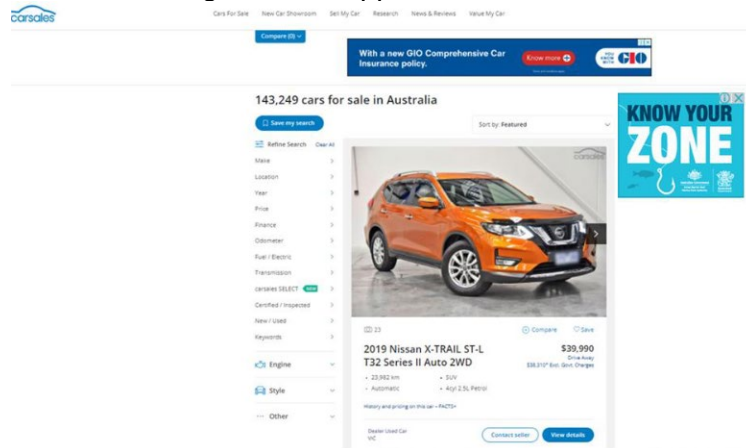
Figure 19. Example of paid advertising.

To enhance this cars.com, the placement should be refined to include vehicles most likely owned by the target market. Towing weights require at least a mid-sized SUV. This information can be obtained in consultation with Dept of Transport to cross reference vessel and vehicle registrations in the catchment area. This information can then be used to place online advertising beside vehicle most commonly used to tow vessels and reach target audience sought. And increase effectiveness of spend.

Figure 20. Second example of advertising.

While this ad placement is with an article with high click rate, meaning it was seen quickly and the ad spend occurred quickly, the value to GBRMPA is unclear in terms of the connection between the target audience and their ability to action the CTA.

Outdoor Advertising Examples

The placement of outdoor advertising is common practice in commercial marketing, advertising, and promotion of messaging for products and services. The placement of GBRMPA recreational fishing messaging at service stations as a necessary step in going fishing for the majority of shore and boat-based fishers is a good initiative.

The particular advertisement has a lot of copy in a very small signage space. As some of the messaging is repeating information, the copy could be tweaked to create a cleaner creative space and more easily and quickly absorbed message for the (Pieters & Warlorp 1999; Pieters & Wedel, 2007; Radach et al, 2003; Rayner et al. 2001; Wedel & Pieters, 2000), see also Fitts' Law – on eye tracking for audience attention, and F pattern advertising design studies from the Nelson Group, for some easy read grey literature explanations.

There is also no CTA enabler for the audience in the messaging, providing the audience with the means of complying with the request.

Figure 21. Outdoor advertising September Holiday Compliance 2021-2022

As discussed in our project meetings, outdoor advertising placement would be benefitted by extending the use of outdoor placement within a strategic marketing framework for GBRMPA engagement with recreational fishers, and also opens opportunities to build stronger industry stakeholder partnerships.

Further placement identification could be achieved through conducting a 'customer journey' style walk through of recreational fishers is recommended to identify further touch points. Ideally these would be by steps taken on an average fishing trip for each of the identified target audience profiles identified from the project survey and completed in the course of later focus groups in this project.

Figure 22. Protect Your Patch Capricorn Cost June 2019 Campaign.

Billboard messaging can be very effective in advertising campaigns. However, the design needs to be easily readable, using identifiable branding, have a clean creative, and leverage simple copy messaging, to suit the 2 – 3 seconds of viewing timing for audience driving past the signage.

Similar observations apply to the use of billboard advertising in the Yeppoon Est (Mulara, Airlie Beach West Shute Harbor Road, and Portsmith, Ray Jones Road, Cairns campaign creatives and copy in the 2020 campaigns).

There was no information on where this billboard is located, however, in keeping with the customer journey concept to strategically identify points of contact with the target audience, ideally placement of these outdoor advertising messages would be enroute to major recreational fishing destinations.

Social Creatives Examples

There is already a lot of different general and compliance messaging being conveyed currently by GBRMPA socials. Having lots of messaging in market can create confusion and overwhelm with the audience and cause them to switch off and ignore all messaging, thereby hampering campaign objectives.

While some variation can be helpful in presentation to market, the messaging is best kept consistent (and pilot tested to identify in pre campaign launch steps). Taking this approach

aids repetition and recall of the messaging with the audience. Compliance messages would benefit from simplification, rationalization to key messages, and clarity and consistency in execution of those key messages.

Where there is a need to create campaign assets inhouse, design may be guided by creative and/or marketing/advertising experts to align the use of colour, layout of visuals, and message creation. An example is seen by the different 'Over the Line Pay the Fine' creatives below. The concept for this asset is reasonable. However, the execution creates confusion in the positioning of the boat, use of colour for the green zone, and the red colour (in common practice indicating danger or wrong choices) covering both zones.
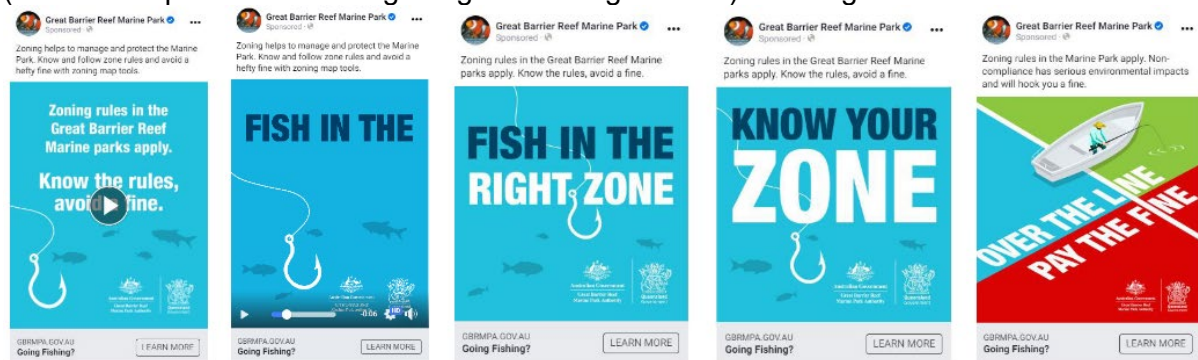
Figure 23. September Holidays Compliance 2021-2022 MPR.
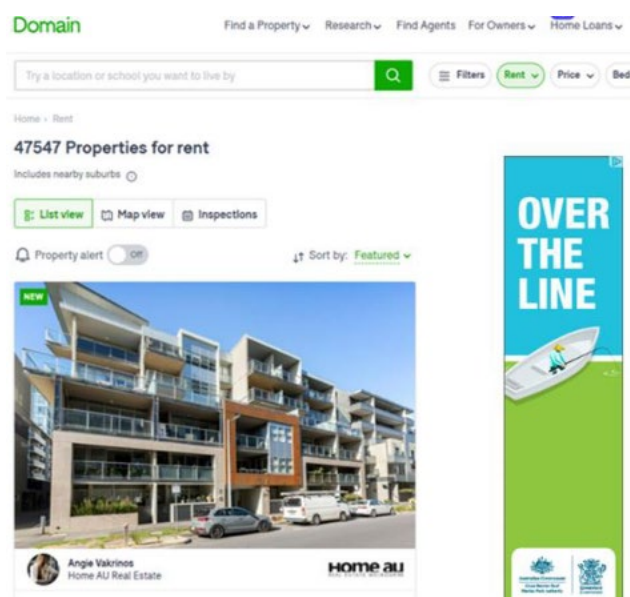
Figure 24. Rec Fishing July Campaign 2022-2023 Live Report

Metrics and Copy/Creative Campaign Asset Pretesting

The decision to not run this campaign asset it fully supported by this review. Neither the A or B option provides creative or copy that adheres to best practice in messaging in any aspect. This example highlights the importance of the selection of the correct metrics, which click through rates and speed of expenditure of allocated budgets do not provide in this circumstance.

Behavioural theory and advertising theory support these creatives as most likely to encourage fishing in the green zone, the opposite of the intended campaign outcome.

This example also highlights the importance of the combination of topic specific content knowledge, human behavioural theory, and practical advertising outcomes, when assessing campaign results.

However, the use of appropriate asset testing through A/B methods and other common commercial marketing practices is fully supported and should be encouraged when supported with appropriate knowledgeable guidance from expert marketers, and sample participants from the general public and relevant target audience segments.
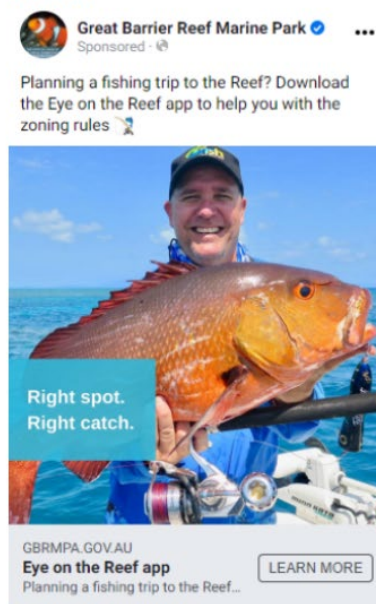
Figure 25. September Compliance Campaign 2020 UM Report Summary.

Appendix K: Traffic light system and feedback matrix

Traffic light system is described in Table 10, with the reference table for the system shown at Table 11.

Table 10. Traffic light system

Green	Healthy engagement and activity that doesn't threaten the reputation of the department or pose a legal risk.
Amber	Activity should be closely monitored. Such activity suggests there is potential to escalate or violate ASB advertising standards (activity may include conversations with multiple comments and likes). Action should be taken, as required.
Red	Hide post immediately and do not engage. This content includes racism, sexism, discriminatory remarks, abusive remarks, spam (advertising).

Table 11. Reference table for traffic light system

Please note: there are legal implications with associated fines for fishing in the wrong area. The promotion and use of the app and zoning videos include a disclaimer, so if in doubt please contact a member of the team.

Traffic light	Comment	Description	Real examples	Response process	Responsibility and clearance required
Green	**Positive or question**	**Favourable posts, or questions**	'The app is great' 'Can you tell me more about'	**Positive:** Like or reply ('thanks')	
	Neutral (ignore)	**Neither good nor bad**	'I use the app all the time'. 'I love to fish – can't wait to get out this weekend' (etc.) 'I don't like the app'	Action/Response not required	
Amber	**Comment about advert not being practical**	**Neither good or bad but could escalate.**	'This ad is stupid as it says the app shouldn't be used for navigational purposes'.	Address comments on a case-by-case, may require escalation to department for detailed response. Some possible responses are in the template below.	
Amber	**Negative (address and engage, if appropriate)**	**Genuine negative comment**	'The app doesn't work properly.'	Address genuine comments with a pre-approved response where appropriate.	
Amber	**Negative**	**Genuine question/comment**	'Why does the app want to access to our photos?' 'The app is trying to track you – don't download it'.	Address genuine question with pre-approved response or by providing further information. Escalate to Reef Authority if any concerns/uncertainties about the app usage and parameters.	
Amber	**Negative**	**Genuine question/comment**	The Reef is stuffed anyway – I'll fish where I want to. Green means go!	Address genuine questions/comments with pre-approved response or by providing further information.	
Amber	**Negative**	**Genuine question/comment**	These guys aren't fishers! What a joke.	Address genuine comments with a pre-approved response where appropriate.	
Red	**Negative (hide comment)**	**Breaches Community Guidelines** e.g. offensive, obscene	'This campaign is a load of #$%@'	Comments should be hidden and not visible on the department's feeds*	

Traffic light	Comment	Description	Real examples	Response process	Responsibility and clearance required
		language, phishing scam, malicious or advertising	'Click here to win a million dollars www.persianprince.i'	If a user posts three Red comments, the user will be blocked.	
Red	**Crisis (Escalate, do not engage)**	**Legal or criminal ramifications** e.g. threat of violence towards department or other user, racism, breach of confidentiality or defamation etc.	'Do the rules apply to everyone?' (indicating racial/discrimination) 'I'll fish where I like – I don't care, they won't catch me"	These comments should be hidden. Record and forward to departmental contact for action as appropriate.	
Red	**Crisis (Escalate, do not engage)**	**Political** e.g. mentions government, Prime Ministers or politicians	'The government is #$%@ and doesn't do anything to help the reef so why should we' 'The PM is #$%@ and doesn't care about the reef so why should we'	These comments should be hidden. Record and forward to departmental contact for action as appropriate.	

Table 12. Recreational Fishing campaign: Social moderation responses

These response were reviewed by the research team and feedback provided, with some uptake and further drafting work to be implemented in response drafting.

Social media moderation | Matrix of approved responses for campaigns	
Campaign name: Recreational fishing campaign/compliance campaign - Pilot	
QUESTION | COMMENT EXAMPLE	RESPONSE
FAQs (listed below) can also be found here:	
How to use your Lowrance Elite GPS plotter	https://youtu.be/dYmkjs8NMHk *The GPS units used in this instructional video are for demonstration purposes only. Their depiction does not suggest that they, or any individual vendors or services associated with them, are necessarily endorsed or recommended by either the Great Barrier Reef Marine Park Authority or the Queensland Parks and Wildlife Service. Consumers should make their own enquiries as to which GPS units are most suited to their individual needs.*
How to use your Garmin GPS plotter	https://youtu.be/YTK0h67_xYk Please note: The GPS unit used in this instructional video is for demonstration purposes only. Their depiction does not suggest that they, or any individual vendors or services associated with them, are necessarily endorsed or recommended by either the Great Barrier Reef Marine Park Authority or the Queensland Parks and Wildlife Service. Consumers should make their own enquiries as to which GPS unit is most suited to their individual needs
How to use your Raymarine GPS plotter	https://youtu.be/ITPdrb_d2J0 Please note: The GPS unit used in this instructional video is for demonstration purposes only. Their depiction does not suggest that they, or any individual vendors or services associated with them, are necessarily endorsed or recommended by either the Great Barrier Reef Marine Park Authority or the Queensland Parks and Wildlife Service. Consumers should make their own enquiries as to which GPS unit is most suited to their individual needs
Video disclaimer (for three videos above)	*Note GPS chartplotter video Disclamer:* *The GPS units used in this instructional video are for demonstration purposes only. Their depiction does not suggest that they, or any individual vendors or services associated with them, are necessarily endorsed or recommended by either the Great Barrier Reef Marine Park*

	Authority or the Queensland Parks and Wildlife Service. Consumers should make their own enquiries as to which GPS units are most suited to their individual needs.
Where can I get information about zoning?	Finding zoning information for the Great Barrier Reef Marine Park is a breeze! The Marine Park Authority's website has easy-to-use maps and comprehensive information on fishing zones that can help you plan your next fishing trip. Have a great time exploring the beauty and diversity of the Great Barrier Reef Marine Park while casting a line and reeling in your next big catch! Maps are also available on the Reef Authority's website at Zoning maps | gbrmpa
General Amber negative comments	Thank you "**NAME**". We appreciate your feedback and would love to hear more from you. To help us better address any concerns you may have, please visit our website and share your thoughts with us. Thank you for your input.
Can I have the link to the Capricorn area? What map is the Capricorn area?	For all your free maps, app and more, visit: https://www2.gbrmpa.gov.au/access/zoning/zoning-maps
Can I travel through a Green Zone with a fish on-board?	Travelling through a Marine National Park (Green) Zone with fish onboard is allowed, provided the fish were caught outside the Green Zone. Recreational fishers can enter a Marine National Park (Green) Zone and participate in activities such as swimming and snorkelling. Just keep in mind that it's a look-but-don't-catch zone, so all fishing gear like rods with attached hooks must be stowed inboard the boat or in rod holders. Further information about zones can be found here Interpreting zones | gbrmpa
How must my fishing gear be stowed or secured to travel through a Green Zone?	You can travel through a Marine National Park (Green) Zone with fishing gear on board provided that all fishing lines are stowed or secured; that is, any line or hand-held rod is inboard the boat or in rod holders. While a hook can still be attached to a line, no part of any fishing gear may be in the water.
What happens if I unknowingly drift into a Green Zone while fishing?	Just a friendly reminder: fishing is not allowed within a Marine National Park (Green) Zone, even if it's unintentional. This helps to ensure the protection of the diverse and delicate marine environment within the Green Zone. Thank you for being mindful of these regulations and helping to preserve the natural beauty of the Great Barrier Reef Marine Park!
Where can I get the coordinates for the no-fishing zones?	The Great Barrier Reef Marine Park Authority (GBRMPA) provides coordinates on the 1:250,000 maps for the majority of no-fishing zones (Green Zones or Pink Zones) in the Marine Park. The coordinates for any individual zone, including Conservation Park (Yellow) Zones, may also be obtained by:

	- Using the mapping tool available from the home page, where you can generate maps for a particular area. - Looking for the relevant zone in Schedule 1 in the back of the Zoning Plan (to assist you, the identification numbers on the Conservation Park (Yellow) Zones and more restrictive Zones on the 1:250,000 maps, correlate with the location number in Schedule 1 to the Zoning Plan). - Ringing the Great Barrier Reef Marine Park Authority on free call 1800 990 177.
Where are the coordinates for inshore zones?	As far as possible, zone boundaries along the coast have been aligned to recognisable coastal features. To the extent possible, the shapes are also simple and line up north-south or east-west. However, if there is any confusion, refer to the specific zone coordinates in Schedule 1 to the Zoning Plan. Please also refer to the Reef Authority's website for more information on Zoning. Zoning maps | gbrmpa
How do I access map coordinates if I don't own a computer?	You can call the Great Barrier Reef Marine Park Authority on 1800 990 177 and ask for specific coordinates to be sent to you. If you are seeking a large number of coordinates, a copy of the Zoning Plan including the Schedule of all zone boundaries may be more appropriate.
How do I know where the zones are if my boat doesn't have navigational/plotting equipment?	No GPS? No worries! Most Marine National Park (Green) Zones and Conservation Park (Yellow) Zones close to the coast are easy to locate with headlands or landmarks. Offshore zones can be large, so stay well away from no-fishing zones or use a GPS. And for even more convenience, download the free Eye on the Reef app from the App Store or Google Play. Happy fishing! You can also access more information and tools to download at the Reef Authority's website at Zoning | gbrmpa.
What is the difference between line fishing in a Yellow Zone and line fishing in Light and Dark Blue Zones?	Line fishing using not more than three hand-held rods or handlines per person with a combined number of not more than six hooks attached to the line(s) is allowed in General Use (Light Blue) and Habitat Protection (Dark Blue) Zones. In the Conservation Park (Yellow) Zone, line fishing is limited to one hand-held rod or hand-held line per person, with no more than one hook per line (note also the definition of a hook below). Further information can be found on the Reef Authority's website at Interpreting zones | gbrmpa
What restrictions are placed on trolling in Light Blue, Dark Blue, Yellow and Olive Green Zones?	Trolling means fishing by means of a line or lines trailed behind a vessel that is underway using no more than three lines per person (with no more than six hooks per person in total).

	Trolling is allowed in the following zones: - General Use (Light Blue) - Habitat Protection (Dark Blue) - Conservation Park (Yellow) - Buffer (Olive Green) In the Buffer (Olive Green) Zone, trolling is limited to the take of pelagic species only including species of trevally, scad, queenfish, rainbow runner, dolphinfish, black kingfish or cobia; barracuda, sailfish, marlin, swordfish, mackerel, tuna, bonito, wahoo, small-toothed jobfish, and green jobfish. Further information can be found on the Reef Authority's website at Interpreting zones | gbrmpa
There are limits placed on the number of hooks allowed per line in some zones, does a multi-hooked lure or gang hook, for example, count as more than one hook?	There is a limit, throughout the Marine Park, of using no more than six hooks per person. In the Conservation Park (Yellow) Zone, the limit is one hook and one line per person. In addition to its ordinary meaning, a hook means: - A single-shanked double or treble hook; or - A lure (an artificial bait with not more than three hooks attached to it); or - An artificial fly; or - A jig for taking squid; or - A bait jig, which is a hook or group of hooks consisting of no more than six hooks, each hook being of a size between number 1 and number 12 (both inclusive) or their equivalent; or - A ganged-hook set, consisting of no more than six hooks, each of which is in contact with at least one of the other hooks in the set. View diagram of hook definitions [PDF 1.42 MB]
Why can I spearfish in some Yellow Zones, but not others?	Limited spearfishing is allowed in most Conservation Park (Yellow) Zones, but please note that all spearfishing is prohibited in Public Appreciation Special Management Areas. These areas are shown as broken pink lines on the zoning maps and are multiple-use areas where there is potential for conflict between user groups for example near resorts, dive sites, pontoons.
Are the zoning boundaries available for electronic chart plotters?	For sure! The Great Barrier Reef Marine Park Authority has supplied boundary information to the major electronic chart companies and GPS manufacturers for incorporation into their products. Check with your manufacturer.
How does the Great Barrier Reef Marine	The Great Barrier Reef Marine Park Authority is committed to ensuring compliance and protecting the Marine Park from illegal activities. In partnership with the Australian and

Park Authority enforce zoning?	Queensland Governments, we conduct regular boat and aircraft patrols to monitor activities. It's important to note that penalties apply for individuals who enter or use a zone for purposes other than those allowed for in the zoning plan. We appreciate your cooperation in helping us to protect this precious ecosystem.
Who can I address any other questions to?	If you have any questions, concerns or suggestions about zoning, please contact the Great Barrier Reef Marine Park Authority on free call 1800 990 177 or email info@gbrmpa.gov.au. If you have any queries about State waters Department of Environment and Resource Management.
FROM PREVIOUS CAMPAIGNS	
General comments about feedback on the app	Thanks for the feedback, we're currently looking into updates and new features 👍
General negative comments regarding the Eye on the Reef App	Thank you for your feedback. We're sorry to hear about your negative experience with our app. Our team is always looking for ways to improve and we value your input. To help us better address any concerns you may have, please visit our website and share your thoughts with us.
Why does the app need to access my photos?	The Eye on the Reef app does more than just show you zoning info. You can also use it to report animal sightings and incidents, which helps us protect the Reef. You can attach photos or videos if you like, but it's optional. Thank you for being an engaged member of the fishing community!
What about phone coverage?	Hi there! We highly recommend downloading the Eye on the Reef app before your next trip to the Marine Park. With the app, you'll have access to the Marine Park zoning information even when outside of mobile range. This is a great way to ensure you're always aware of where you can fish and what areas are off-limits. More information can be found here Eye on the Reef app	gbrmpahttps://www2.gbrmpa.gov.au/access/zoning/eye-on-the-reef-app
The app says it's only a guide, so why use it?	Hey there! While the Eye on the Reef App is an amazing tool to help you keep track of Marine Park zoning, it's important to note that it's not a navigation aid. For the most accurate information, we recommend checking your GPS chartplotter or zoning map. If you need any additional information, be sure to check out our website at gbrmpa.gov.au. Thanks for being a responsible fisher and helping us protect the Great Barrier Reef!
The fine print says don't use the app for navigation?	Hey there! While the Eye on the Reef App is an amazing tool to help you keep track of Marine Park zoning, it's important to note that it's not a navigation aid. For the most accurate information, we recommend checking your GPS chartplotter or zoning map. If you need any additional information, be sure to check out our website at gbrmpa.gov.au. Thanks for being

	a responsible fisher and helping us protect the Great Barrier Reef!
"Green means go"	Hey there, friend! Just wanted to remind you that Green Zones, aka Marine National Park Zones, are like a strict vegan diet - a "no-take" area. You can't fish or collect anything without a permit. So, make sure you know what zone you're in and what rules apply, or you might end up on the wrong side of the law! More information can be found here Interpreting zones | gbrmpahttps://www2.gbrmpa.gov.au/access/zoning/interpreting-zones
Why are there Green Zones?	Hey there! Did you know that Green Zones, also known as Marine National Park Zones, can actually help increase the population of species like coral trout and snapper? By giving these vulnerable species a safe space to breed and reproduce, we're actually seeing up to 60% of juveniles in open areas come from parents who live in nearby Green Zones. Pretty cool, huh? If you want to learn more about Great Barrier Reef Marine Park zoning, check out https://www2.gbrmpa.gov.au/access/zoning
Comment re: "night fishing or similar" i.e. that's why I fish at night haha	Hey friend! Just a quick reminder that our rangers are always on the lookout for any illegal fishing activities, even in the dead of night (our rangers never sleep, just like the fish!). So please stick to the rules and regulations to avoid getting caught and receiving a fine. Let's keep the Marine Park thriving for generations to come!
Green zones need to be moved	Hey there, thanks for sharing your thoughts! We understand that green zones can be a bit confusing, but they're actually pretty cool. Think of them like a time-out zone for fish, where they can grow big and strong and make lots of little fishy friends. If you want to learn more about how zoning benefits everyone (including us fishers), check out this link: https://www2.gbrmpa.gov.au/access/zoning
Rotate the zones like you said you would.	Rotating green zones might seem like a good idea, but it turns out it's not very effective. That's why we put a lot of effort into carefully placing them where they'll have the biggest positive impact on the Reef and all the creatures that call it home. If you want to learn more about how zoning benefits everyone (including us fishers), check out this link: https://www2.gbrmpa.gov.au/access/zoning
The Reef is fine, leave it alone.	The Great Barrier Reef is an incredible place for fishing and enjoying it with family and friends. By having zones in place, we can protect the incredible biodiversity of the Great Barrier Reef and keep fishing opportunities available for generations to come. Plus, who doesn't love catching bigger and healthier fish?
I can fish where I want.	Hey there! It's understandable to feel frustrated, but let's remember that we all share the responsibility to ensure sustainable fishing practices. By having zones in place, we can protect the incredible biodiversity of the Great Barrier

	Reef and keep fishing opportunities available for generations to come. Plus, who doesn't love catching bigger and healthier fish!
The reef is not dying, it has more coral cover than ever.	While we appreciate your enthusiasm for the Reef, we want to make sure that we protect the amazing marine life that calls the Reef home. Let's work together to follow the zoning rules and keep the Reef great for generations of fishers to come. So, grab your fishing gear, head out to the Reef, and have a fantastic day fishing while keeping our Reef great!
These guys don't look like they are fishing on the Reef! What a joke.	It's totally understandable if the boundaries seem a bit complex, but the park actually includes more than just the Reef itself - it also covers coastal areas and islands. But don't worry, we've made it easy for you to understand! Before you go, just make sure you plan ahead and know which zone you'll be in and what rules apply. Thankfully, there are plenty of tools available to help you understand where you can and can't fish, so you won't have to rely on guesswork or fisherman's intuition. Happy fishing, and remember to stay within the designated zones!
These fishers haven't a clue. What a joke.	Well, fishers are quite the diverse bunch! From city slickers to country bumpkins, they come from all walks of life. But there's one thing that unites them all: their insatiable love for fishing! And who can blame them? There's nothing quite like spending a day out on the water, either kickin' it with your friends or escaping the daily grind and catch some much-needed Zen.

CONTACT

Vanessa Adams

vm.adams@utas.edu.au

Web: www.nespmarinecoastal.edu.au/