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MARINE BIODIVERSITY hub

The South-east Commonwealth Marine Reserves Network — Public Knowledge, Perceptions and Values Survey

Michael Burton (UWA), Sarah Jennings (UTAS), Ludovic Fragnol (AgroParisTech), Jean-Baptiste Marre (Secretariat of the Pacific Community), Samantha Parades (QUT), Sean Pascoe (CSIRO), Abbie Rogers (UWA), Satoshi Yamazaki (UTAS)

Theme 2: Supporting management of marine biodiversity

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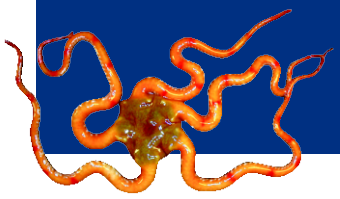

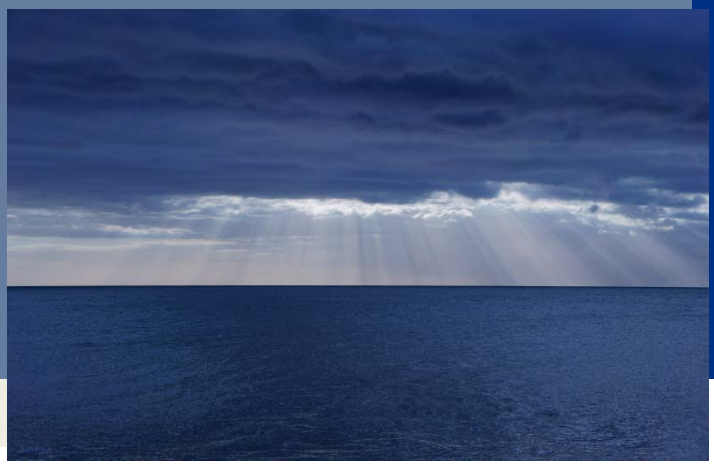

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Enquiries should be addressed to:

Michael Burton
Michael.Burton@uwa.edu.au

Distribution list

Amanda Richley, Parks Australia

David Logan, Parks Australia

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Important Disclaimer

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1. EXECUTIVE SUMMARY

Commonwealth marine reserve networks play a central role in supporting important conservation objectives and also contribute to economic and social values. Efficient design and effective management of reserve networks requires consideration of the costs and benefits of alternatives, and should include measurement of the preferences of the general public who, even if they do not make direct use of the marine estate, may still hold existence values for assets protected by these networks.

An online survey of 1122 residents of the South-east marine region (South Australia, Victoria and Tasmania) was undertaken to identify the public's knowledge and perceptions of the South-east Commonwealth Marine Reserves Network, and to investigate the values that they hold for various features protected by the Network. We also determine the effect of providing information about these key features in different ways on the measured public preferences, and of explicitly explaining the importance of affording protection to a representative range of features through a network of reserves. Respondents were drawn from an online research panel and the survey was conducted in June 2015.

An initial analysis of the publics' knowledge, understanding and perceptions data showed that the protection of marine ecosystems is seen as an important issue, based largely on moral rather than utilitarian values. However, the overall level of knowledge about Commonwealth marine reserves was quite low, with only 23% of respondents saying that they had heard of them before. Of the 86 respondents who had heard about the SECMRN, the Department of Environment website, articles in newspapers, radio news or talkback and friends and relatives were the most popular source of this information.

We used a choice experiment to recover public values for five features of the South-east marine estate that are represented in the SECMRN, namely bioregions, seafloor types, important ecological areas, important areas for white shark populations and areas less than 1500m depth. Our analysis showed that, on average, respondents held significant, positive values for increased levels of protection for bioregions, seafloor types, important ecological areas, and areas less than 1500m depth. Increases in protection for important areas for white shark populations, had a more mixed response, with an even split between those who valued more protection, and those who preferred to not see an increase in protection. A cost attribute was negative, implying higher personal costs associated with network management measures reduce utility.

The results suggest that there is considerable heterogeneity in preferences within the sample. Further investigation of individual's values of changes in the level of protection of reserve network features (partworths) suggested that attitudes towards the importance of protecting sharks might be taken as an indicator of the extent to which other features of the marine reserve network are valued and of the broader

marine ecosystem as a whole. We infer that those who think it is important to protect great white sharks, despite their popular image as a threat to humans, may take a more holistic view of protection of the environment, and this is manifest in their willingness to protect other, broader aspects of the marine ecosystem.

We find no evidence that public values for features were affected by the manner in which we presented information in the survey, or by the inclusion of a video featuring a scientific expert explaining the importance of affording protection to a representative range of features through a network of reserves. There is however, some evidence that these things influenced the rate at which respondents dropped-out of the survey and their self-assessment of how much they had learnt from the presentations.

The results of the choice experiment suggest some further avenues for analysis, including methods aimed at unpacking respondent heterogeneity. We also note the potential richness and value in having provided baseline information against which progress with implementation of the SECMRN management plan can be assessed, particularly outcomes associated with promoting community understanding of the importance of the marine reserves network, the values it protects and management arrangements and in the design of communication and education plans.

2. INTRODUCTION

The Commonwealth marine estate in the South-east region of Australia contains a wide range of important oceanographic, sea-floor, biodiversity, and cultural and heritage features. It also supports a variety of valuable marine industries including commercial fishing, tourism and shipping, as well as oil and gas production. Significant potential uses include renewable energy and carbon storage (Director of National Parks, 2013). The region's marine estate also supports important social values involving both direct use (e.g. recreational fishing) and non-use values (e.g. existence values).

Marine reserves are one of a number of management instruments available to support the conservation and ecologically sustainable use of the marine environment and its biodiversity. When used with other management tools, representative networks of marine reserves are recognised as being particularly effective at achieving positive conservation outcomes over broad geographical scales (Kelleher, 1999). Marine reserves, when well designed and managed effectively, make an important contribution to maintaining the overall health and resilience of our oceans (Director of National Parks, 2013).

Reserve network design in Commonwealth waters (which start 3 nautical miles offshore) was guided by a series of four primary goals and 20 design principles, aimed at ensuring representative systems of marine protected areas (Department of Sustainability, Environment, Water, Population and Communities, undated) [1]. The goals relate to the specific need to ensure representativeness of bioregions, depth ranges, examples of benthic and demersal biological features and seafloor features. Definition of these primary conservation features further distinguishes between provincial and meso-scale bioregions, and in the case of biological features, between key ecological features and biologically informed seascapes (Department of Sustainability, Environment, Water, Population and Communities, undated).

The South-east Commonwealth Marine Reserve Network (SECMRN) was established in 2007 and comprises a network of 14 Commonwealth marine reserves and forms part of Australia's National Representative System of Marine Protected Areas which is aimed at meeting Australia's international commitment as a signatory to the Convention on Biological Diversity. The fourteen reserves within the South-east Network were established under the *Environmental Protection and Biodiversity Conservation Act*. The SECMRN encompasses waters stretching from Kangaroo

[1] Establishment of the South-east Commonwealth Marine Reserve Network preceded specification of these goals and principles, and the design of this Network was guided by Australia's South-east Marine Region – A User's Guide to Identifying Candidate Areas for a Regional Representative System of Marine Protected Areas (Anon., 2003).

Island (South Australia) to the south coast of New South Wales, including Victoria and Tasmania. The network covers approximately 388 464 km2 and water depths from 40m to 4600m (see Figure 1).

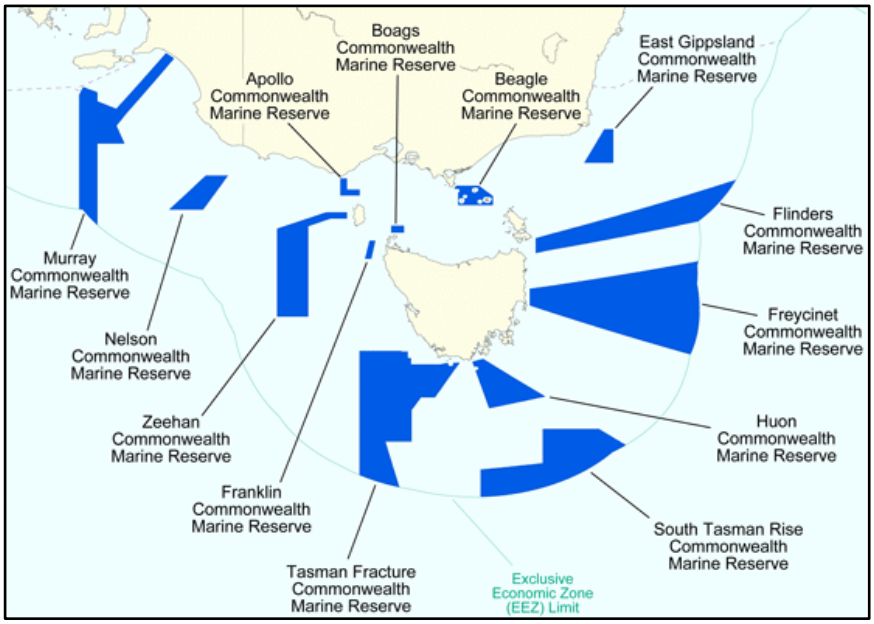

Figure 1 The South-east Commonwealth Marine Reserves Network (Macquarie Island not represented)

The SECMRN is one of six such networks in Commonwealth waters but is the only one for which a management plan is currently in place (Director of National Parks, 2013). The SECMRN Management Plan is the primary tool for the conservation and management of the network, and allows reserves to be managed at a scale that accommodates the dynamics and connectivity of marine ecosystems in the region. The Plan's objectives are to

1. Provide for the protection and conservation of biodiversity and other natural and cultural values of the South-east Network; and to

2. Provide for ecologically sustainable use of the natural resources within the South-east Network where this is consistent with objective 1.

Each marine reserve within the Network, and where a reserve is divided into zones, each zone within a reserve, is assigned an International Union for Conservation and Nature (IUCN) category. The assigned IUCN category and management zoning is commensurate with the purpose for which the reserve was established. Zoning therefore comprises a key planning tool in managing the reserve network, and prescribes the rules applying to activities associated with human use, detailing how and where activities are allowed to occur and what activities are prohibited (Director of National Parks, 2013). While changes in the outer boundaries of reserves are unlikely, and the life of the Management Plan is for a period of 10 years, the Plan

does allow for some flexibility to adapt management responses over this period, through changes in permitted usage.

Implementation of the foundation phase (years 1 -4) of the SECMRN Management Plan is guided by the Implementation schedule (Parks Australia, undated). This identifies clear actions to be implemented under each of seven strategies, aimed at contributing to the achievement of one or both of the Management Plan objectives. One of these strategies is to promote understanding of, and stakeholder participation in, management of the marine reserve network, with one of its long term goals (10 years) being to have stakeholders and the community understand the importance of the marine reserves network, the values it protects and management arrangements.

The designation of areas of the South-east marine estate as Commonwealth reserves and the subsequent restrictions on use imposed through the SECMRN Management Plan effectively constrain access to the marine estate to some users, and alters the flow of net benefits to these groups while potentially increasing the non-consumptive benefits to others. Efficient design and effective management of reserve networks requires consideration of the costs and benefits of alternatives.

Identification and measurement of costs and benefits, and preferences, of stakeholders that have direct links to the ocean are relatively easy to assess. Less easily quantified are the costs and benefits associated with marine management alternatives (including marine reserve network design and management) for those who gain non-consumptive benefits. This group, even if they do not make direct use of the marine estate, may still hold existence values for assets protected by these networks. They may also feel there are benefits associated with potentially displaced uses, for instance the existence of a healthy fishing community.

The total marine area within Australia's EEZ comprises some 10 million square kilometres, which is larger than the 7.7 million square kilometres of the Australian mainland. Although eighty six percent of people live within fifty kilometres of the coast (2013 Sustainability report), experience and knowledge of the Commonwealth marine estate and its assets is generally low, reflecting its inaccessibility and the low visibility of features particularly at great depth. Like terrestrial environments, marine environments comprise complex ecosystems and are characterised by linkages and feedbacks many of which are either scientifically uncertain or unknown. Furthermore, while knowledge of deep water marine ecosystems and of less visible assets (such as deep sea canyons), and of larger scale features such as bioregions and ecosystems may be poor, some components may be familiar to the general public, such as iconic species (for example whales, sharks and dolphins) and some habitats (such as coral reef and seagrass).

Choice experiments provide a powerful tool for quantifying non-use values in cases such as this, where values cannot be revealed through actual market transactions. While subject to a number of widely documented challenges (see the collection of papers in *Journal of Economic Perspectives* Vol.26 No.4, 2012 for a review of the arguments for and against the use of valuation studies and Rogers et al (2015); Baker

and Rutting (2014) and Marre et al, (2015) for a discussion of their use in policy making in Australia), non-market valuation that relies on individuals stating their preferences in constructed rather than real choice situations, faces particular challenges when used to value goods which are both scientifically complex and with which the public may have low familiarity. However, it is the one method which allows one to capture data from the broad population, in a consistent manner, with an underlying conceptual framework that provides a quantifiable interpretation of preferences. Compared to terrestrial ecosystems, there are fewer marine studies, but the literature is growing: see Beaudoin and Pendleton (2012) for reasons why valuation is important, Davis et al (2015) for an overview of assessing costs and benefits of marine protected areas, and Lipton et al (2015) for a review of the US experience in marine valuation studies.

The theory behind choice experiments is well documented elsewhere (e.g. Bateman et al 2004, Hensher et al 2015) and will not be described here. Briefly, however, a choice experiment for an environmental outcome mimics a market choice: respondents are presented with a limited set of alternatives (comprising a choice set) and asked to identify the preferred alternative from that set. Alternatives are characterised by a set of attributes, which differ in their levels, so in making choices respondents are required to make trade-offs, both in terms of ecological attributes but also any (hypothetical) personal cost that may be attributed to selecting a particular alternative. By designing the combinations of attribute levels that appear across multiple choice sets one can identify, statistically, the preference structure that led to the choices, and interpret that structure in monetary terms, as the willingness to pay to achieve changes in attribute levels.

3. STUDY OBJECTIVES AND SURVEY IMPLEMENTATION

The three key objectives of this study were to:

- Provide data on the general publics' understanding of the importance of the marine reserves network, the values it protects, the management arrangements, and of the publics' attitudes to the protection of marine ecosystems and beliefs about threats;

- Identify the general publics' preferences for the level of protection provided to various key features of the South-east marine region by the SECMRN and its Management Plan, and;

- To determine the effect of providing information about these key features in different ways on the measured public preferences, and of explicitly explaining the importance of affording protection to a representative range of features through a network of reserves.

All three objectives were addressed in this study using an online survey of the general public in the South-east marine region (Tasmania, South Australia and Victoria), drawn from a commercial online research panel. Definition of the study objectives

and design of the survey were informed through a series of meetings between researchers and members of the Commonwealth Marine Reserves Branch of the Department of the Environment (Parks Australia). The survey design was also informed by a pilot study conducted in Western Australia in August 2014 by Ludovic Fragnol (Fragnol, 2014).

Sensitivities about issues related to marine reserves generally and the potential for confusion with parallel policy processes to review the approach to CMR network management in neighbouring regions meant that the survey was implemented as an independent academic research project. The final implementation, analysis and interpretation of the results of the survey were the responsibility of the authors.

The survey was administered by a market research company (Online Research Unit) that maintains a research (not marketing) national panel. Data was collected in June 2015. Researchers examined the data for the first 68 respondents for any issues related to survey implementation before proceeding to a full survey launch. In total, 1122 completed responses were received and formed the basis of our analysis.

3.1 The South-East Marine Reserves Network – public knowledge, perceptions and values survey: description and administration

The final South-east Marine Reserves Network – Public Knowledge, Perceptions and Values Survey (hereafter referred to as 'the survey') instrument comprised two main sections, and a Word version is attached as Appendix 1.

The first section of the questionnaire was concerned with knowledge and perceptions, and consisted of four parts. Questions in Part 1 asked for demographic information about the respondent, including their place of residency. Only respondents declaring their residence as Tasmania, Victoria or South Australia were permitted to continue in the survey. Part 2 asked respondents about their beliefs about the importance of and reasons for protecting marine ecosystems; and about changes in and threats to the condition of these ecosystems. Respondents were also asked to identify ways in which they personally have contributed to the protection of marine ecosystems in the past 12 months. Part 3 focussed on the SECMRN, asking respondents about their knowledge of this Network, the source of this knowledge, their opinion regarding the importance of management strategies and appropriateness of current restrictions on use. Respondents were also asked how important they believed it was to protect a number of individual species protected by the Network, including marine megafauna (such as whales), commercially valuable species (such as tuna), species from the lower trophic levels (such as jellyfish) and deep sea creatures (such as sponges). Part 4 collected information about respondent's participation in a range of marine based activities in general and in the various reserves comprising the SECMRN in particular.

The second section of the questionnaire contained the choice experiment (Part 5) and a series of follow-up/debrief questions intended to gauge the degree to which respondents were confident in their responses to the choice task and to identify responses which reflected protest behaviours (Part 6). This last part also collected a small amount of socioeconomic information about respondents, ascertained their desire for further information about the topics covered in the survey, and invited open ended comment about the survey.

The choice experiment (Part 5) had three components. Firstly, it described five key features of the South-east marine estate are represented in the SECMRN, namely

- bioregions,
- seafloor types,
- important ecological areas,
- important areas for white shark populations and
- areas less than 1500m depth.

Selection of these features in the choice experiment design reflected a compromise between aligning with the primary reserve network design goals (Department of Sustainability, Environment, Water, Population and Communities, undated), providing a complete characterisation of the current network and the need to contain the complexity and size of the choice task. The importance of each of these features and the extent to which they occurred in the region and in the reserve network were described. Although networks may not be currently designed with the objective of protecting specific species, the shark attribute was included to allow the possibility that respondents would place a high level of value on such an iconic species. Thus, its presence in the design allows us to consider issues of icons versus broader ecosystem values. Respondents were also told that the use of management zones within reserves allowed for a varying level of protection (protected vs highly protected) to be afforded these features. The current extent to which each feature was represented in reserves that contained areas of high protection (as opposed to protected) was described in terms of numbers (for bioregions, seafloor types, important ecological areas and important areas for white shark populations) or percentage (for total area less than 1500m in depth).

In the choice experiment, respondents were randomly assigned to one of three information treatments. In the first treatment the key features protected were described using text based information sheets, with the location of features and reserve boundaries shown using regional scale maps. This same information, including the maps, was presented in the second treatment using a video with an oral commentary and showing images of the key features[2]. The third treatment augmented the video treatment with a second short video of an expert scientist

[2] We would like to acknowledge the input of Aisling Fontanini for assistance in the design and production of the video materials.

(marine biologist) explaining the importance of affording protection to a representative range of features through a network of reserves.

In the choice experiment, respondents were told that management was able to further vary the level of protection afforded features within the Network by investing in management measures such as additional codes of practice and monitoring and scientific research. While implying an additional cost, such investments could potentially lead to better or worse conservation outcomes for each feature, relative to that provided by the Network in their absence. This component of the experiment also instructed respondents on how to answer the choice task, providing an example and reminded them to consider their own personal financial circumstances when making their choices.

The choice task was the third component of this section of the questionnaire. Respondents were randomly assigned to one of four blocks, each containing 6 choice sets, where each choice set comprised two options for possible SECMRN outcomes, defined in terms of the levels of each of the five features as well as an additional cost that would be incurred by the respondent. The additional cost ranged from $50 to $300, as an annual payment for 10 years. In all choice sets, the first option described the current situation and therefore incurred no additional cost. Respondents were able to return to the information on key features and management zones at any point during the choice task.

4. RESULTS: ATTITUDES AND UNDERSTANDING

One of the objectives of this study was to provide data on the general publics' understanding of the importance of the marine reserves network, the values it protects and management arrangements, and of their attitudes to the protection of marine ecosystems and beliefs about threats. Responses to questions in Parts 1 to 4 of the survey provide this information and are summarised, by question, in Appendix 1. We do not present the results of analysing this data in depth in this report but note its potential richness and value in providing baseline information against which progress with implementation of the management plan can be assessed, particularly outcomes associated with promoting community understanding of the importance of the marine reserves network, the values it protects and management arrangements and in the design of communication and education plans. Where our survey questions align with those asked in previous Departmental surveys, changes in public attitudes and understanding over time can be assessed. The data provided through this study can also be used to address a variety of more focussed questions and the raw data is available from the lead author. In this section of the report we do however report some key observations about our sample.

The information treatments (text, video or 2 videos) differed in Part 5 of the survey, after the attitude and understanding questions had been completed. We therefore report results for all versions aggregated, as the information treatments will not have influenced this aspect of the survey.

Our sample of 1122 individuals resided primarily in Victoria (72.64%) with 74.24% of the total sample coming from metropolitan areas. About 80% of respondents lived within 50 km of the coast and 78.34% had resided in the South-east region for more than 10 years. The sample was fairly evenly split across males (52.5%) and females (47.5%) and across age classes.

95% of the sample believed that the protection of marine ecosystems is an important issue. Table 1 below summarises the reasons why they think it is important (based on question 2.2, Appendix 1: ranked by number of times item was selected in top 3 reasons). What is notable from these results is the strong moral basis for protection: utilitarian objectives related to marine industries and other benefits are ranked lowest.

Table 1 Reasons for protecting marine ecosystems, ranked by number of times selected in top 3 by 1122 respondents

	number
So future generations can benefit from these ecosystems in the same way that we do today	745
Because it is our moral responsibility to protect these ecosystems	591
Because humans and other species in these ecosystems are all equally important	522
Because these ecosystems should continue to exist independent of any human consideration	489
Because humans need these ecosystems to live	464
So I can enjoy marine activities and/or other benefits derived from these ecosystems during my lifetime	218
So marine industries can remain profitable	156
Other — please specify.	7

48% of respondents thought that the condition of Australia's marine ecosystems is worse than it was 10 years ago, and 42% thought it would be worse still in a further 10 years (this compares favourably to 68% and 56% respectively from a national survey undertaken in 2007 (Colmar Brunton, 2007)). The reasons for the expected future decline in condition are given in Table 2 below (Appendix 1: Question 2.5.1). Pollution and commercial activities are the major impacts, with lack of political commitment (which should be seen as a lack of mitigation, rather than a direct cause of decline) is also highly placed.

Table 2 Percentage of respondents (n=475) selecting reasons for decline in future condition of Australian marine ecosystems (multiple answers permitted)

	% Yes
Because of pollution	73.5
Not enough commitment from policy makers and politicians	61.5
Because of the impact of commercial marine-based activities (such as fisheries, port development and tourism)	56.0
Because of climate change	52.2
Not enough commitment from the general population	48.0
Because of offshore mining activities	38.9
Because of the impact of non-commercial marine-based activities (such as recreational fishing and boating)	23.4
Other — please specify	1.5

Threats to the South-east marine region follow a similar pattern (Appendix 1: Question 2.6): coastal pollution and commercial fishing were identified by 67 and 53% of respondents respectively.

The overall level of knowledge about Commonwealth marine reserves was quite low, with only 23.08% of respondents saying that they had heard of them before. Furthermore, of those respondents who had either heard of them or were unsure whether they had heard of them, 50.73 and 57.59% did not know that they were located in Commonwealth waters (between 5.5km and 370km off the coast) or how they differed from State marine reserves.

Following a brief description of the location and general purpose of Commonwealth marine reserves all respondents were asked whether they thought such reserves were 'a good thing'. Only 39 (3.48%) respondents said that they believed they were 'not a good thing' with 75.22 and 21.3% thinking that they were or being unsure. The most frequently cited explanation for thinking they are 'not a good thing' was because they felt State reserves were sufficient protection; while the most frequently cited reason for those who were unsure was their lack of certainty about their effectiveness in protecting marine ecosystems.

Only 7.66% of respondents indicated that they had heard about the SECMRN, with these 86 respondents indicating that the Department of Environment website,

articles in newspapers, radio news or talkback and friends and relatives were the most popular source of this information. Despite the complexity of many of the concepts/issues presented in the survey a total of 86.28% of the full sample found the information presented either 'interesting' or 'very interesting'. Furthermore, 90.19% of individuals indicated that they had either learnt 'a lot' or 'a bit' about marine ecosystems from participating in the survey. Interestingly, our results do suggest that individuals who received the information that formed part of the choice experiment (Part 5) in the form of a video (treatment 2) felt they had learnt a little more (90.86 vs 86.49%) compared to those who were given a written description of features and management (treatment1). This percentage increases further (93.16%) for the sub-sample of respondents who were also provided with the commentary of the expert scientist (treatment 3).

However, when asked what particular aspects of the SECMRN they would like to learn more about, 36.27% indicated they did not want to know any more about them. Of those who indicated an interest in further information, the most popular aspect was the ecosystems and species protected, but also quite strong interest in a range of aspects related to reserve management, including effectiveness and effects on commercial activities and socio-economic impacts. When asked how they would prefer to receive this information the single most frequently cited means was through television.

Of the 86 individuals who indicated prior knowledge of the SECMRN, 31.4% said that they knew the restrictions on activities quite well. 52.33% had heard of the restrictions but did not know them well and the remaining 16.28% knew nothing of these restrictions.

Respondents were asked to identify which management objectives of the SECMRN were most important to them, by allocating a total of 100 'points' to indicate relative weightings. Table 3 below reports the average allocation for the 802 respondents who completed the question. Again, consistent with the earlier responses on threats, the primary focus is on protection from pollution and other human activities.

Table 3 Relative importance of management strategies

Strategy	Mean allocation
Protect the marine ecosystems of the network against environmental incidents (such as introduction of marine pests, oil and chemical spills)	23.0
Protect the marine ecosystems of the network by minimising impacts of human activities (such as commercial fisheries, mining, recreational fishing and other recreational activities) through management zones in the network	21.8
Improve scientific knowledge of the marine ecosystems protected by the network	13.1
Ensure the enforcement of the management of the network	11.8
Improve public knowledge about the network and promote stakeholder participation in the management of the network	11.5
Evaluate the effectiveness of the network management (through monitoring and review)	10.2
Support involvement of Indigenous people in management of the network	8.6

Only 40% of our total sample indicated that they did not participate in any of the marine activities listed (question 4.1). The highest participation rates were for recreational activities other than fishing, and recreational fishing with 42.06 and 39.4% indicating that they participated in these activities often or participated but not often. 238 individuals indicated that they had (to the best of their knowledge) been in a marine reserve that formed part of the SECMRN.

5. RESULTS: CHOICE EXPERIMENT DATA

The initial task is to remove any respondents who might be deemed to be 'protest' respondents. Protest behaviour is usually seen as being manifest by repeated selection of the status quo option i.e. that they may not be making choices based on a consideration of the full set of attributes available. Repeated selection of the status quo may reflect a heuristic based on confusion, objection to the payment vehicle being used, or to the survey itself.

Table 4 below reports the proportion of the sample selecting the status quo in all 6 choice questions, by treatment. 31% is a relatively high proportion adopting this behaviour, but it was a particularly complex survey. There is no significant difference in rate by information treatment (p=0.741).

Table 4. Rate of selection the status quo option in all choice tasks, by information treatment

	Total	*Treatment 1*	*Treatment 2*	*Treatment 3*
N	1122	370	372	380
All SQ	345 (30.75%)	119 (32.15%)	110 (29.57%)	116 (30.53%)

Table 5 reports the responses of asking this group in the debriefing questions why they had followed this behaviour: multiple choices were possible.

Table 5. Reasons for selecting the status quo in all choice tasks (multiple options possible)

	Total *N=345*	*Treatment 1* *N=119*	*Treatment 2* *N=110*	*Treatment 3* *N=116*
I am happy with the current South-east Commonwealth Marine Reserves Network	59	16	24	19
I do not want to pay an additional cost	249	88	71	90
The choices were confusing	49	20	19	10
The experiment was too complex	52	21	15	16
I did not have sufficient information or knowledge to make such choices	86	35	23	28
Scientists or managers should make such choices, not me	57	25	14	18
The outcomes were irrelevant to me	28	10	11	7
Others. Please specify:	21	5	8	8

A preference for the existing position compared to changes (reason 1) represents a considered choice of options. However, the remaining 7 reasons might be deemed to be protest behaviour of some form (with a concern about cost or a lack of information or knowledge the major reasons). Thus the 325 respondents (28.97% of the total sample) who selected any of the final 7 answers in Table 5 were deemed protest respondents and were dropped from the analysis of the choice data, leaving a sample of 797. It should be noted that although these non-compensatory preferences imply that they should not be included in the statistical analysis, a decision would need to be made as to how to incorporate these respondents in any aggregate value of changes to the management of the marine reserves.

It is of interest to understand who might be behaving in this way: Table 6 reports a logit model explaining protest behaviour based on socio demographics and attitudes. Given our interest in this study in whether the use of the audio visual

materials changed behaviour, indicators of treatment are retained in the model, but are not significant. Those who found the survey confusing, or did not think that protection of marine ecosystems is important (high positive coefficient) are more likely to be a member of the protest group, while women; those with a higher income; those who thought the survey was interesting or covered an important topic (high negative coefficient) were less likely to be in the protest group.

Table 6. Probability of a respondent being a member of the 'protest' group

	coeff	P>|z|
Treatment 2 (multi media)	-0.18	0.340
Treatment 3 (multimedia + video)	-0.08	0.635
Female	-0.43	0.005
Income	-5.4e-6	0.004
Survey too complicated	0.52	0.004
Survey covers important topic	-0.34	0.026
Survey interesting	-0.43	0.008
Protection not important	1.06	0.001
Constant	0.33	0.305
LL=-536.01		
N=797		

The fundamentals of the random utility model employed to explain choices made in the choice experiment (CE) assumes that individuals' choices are determined by the attribute levels in the choices presented to them. These are aggregated into a single measure of 'utility' using estimated parameters that represent the weight respondents give to each attribute, and they choose the alternative that gives them the highest utility. In the simplest conditional logit model, the assumption is made that all individuals hold the same preferences, and hence a single utility function/vector of parameters is sufficient to explain the choices made by all respondents.

Table 7 below reports the results from estimating this simple form of the conditional logit model, for each treatment of the survey and the aggregate sample.

All of the Commonwealth marine reserve features have significant, positive coefficients in aggregate implying that higher levels of these features lead to higher utility, apart from the attribute describing the important areas for sharks, which is not significant. Cost is negative, implying higher personal costs reduce utility.

The status quo coefficient is the alternative specific constant for the 'no change' option. A negative coefficient implies that there is a tendency for respondents to prefer a change in outcome. However, this does not imply that they will always select the changed outcome: this effect will be offset against the higher cost associated with change.

Table 7. Estimation of conditional logit model

	Treatment 1		*Treatment 2*		*Treatment 3*		*Aggregate*		*PW (Aggregate)*	
	coeff	*P>|z|*	coeff	*P>|z|*	coeff	*P>|z|*	coeff	*P>|z|*		*P>|z|*
Bioregions	0.083	*0.000*	0.080	*0.000*	0.059	*0.009*	0.073	*0.000*	11.30	*0.000*
Sea Floor	0.050	*0.001*	0.061	*0.000*	0.045	*0.003*	0.052	*0.000*	7.94	*0.000*
Ecol. Feat.	0.097	*0.000*	0.120	*0.000*	0.048	*0.074*	0.088	*0.000*	13.44	*0.000*
Sharks	0.064	*0.585*	0.112	*0.327*	-0.074	*0.510*	0.033	*0.614*	5.09	*0.624*
Shallow	0.022	*0.365*	0.055	*0.018*	0.038	*0.103*	0.038	*0.005*	5.88	*0.014*
Cost	-0.0070	*0.000*	-0.0065	*0.000*	-0.006	*0.000*	-0.006	*0.000*		
ASC constant	-0.921	*0.013*	-0.569	*0.114*	-1.07	*0.003*	-0.852	*0.000*	-130.38	*0.000*
Choices	3060		3288		3216		9585			
Individuals	255		274		268		797			
LogLikelihood	-982.90		-1053.09		-1044.53		-3088.05			

Test of aggregate model v sub models: $\chi^2_{(14)}$=15.04, p=0.3756

It is possible to test whether the 3 subsamples can be aggregated into a single model and this is confirmed (p=0.3756): the different information treatments do not seem to have affected the choices made.

Although we find that the responses to the choice experiments are equivalent across treatments, it is possible that the information treatments changed behaviour in other ways. Of particular interest is whether it changed dropout rates during the survey i.e. whether respondents found the video presentations more engaging and thus less likely to leave the survey as compared to the text version. Appendix 2 reports dropout rates during the course of each version, and they show that, at the point of

the information being provided, twice as many leave the survey in the text version compared to the video versions. However, overall completion rates for those who started the survey are 88-90%, which is very high.

A partworth (PW) is defined as the amount that an individual is prepared to pay to achieve a unit change in the attribute level. Partworths associated with each attribute can be estimated by taking the (negative of the) ratio of the attribute coefficient to the cost attribute. These values, calculated for the aggregate model only, are reported in Table 7. The partworths suggest the relative rankings decline from ecological features, through bioregions, sea floor features, and shallow areas, with shark areas not significantly valued. However, it should be noted that the attributes are strictly not measured in commensurate units.

The assumption of a homogeneous population, all of whom have the same preferences is a strong one. There are a number of methods of accounting for heterogeneity in preferences:

- Using observed characteristics of individuals: these variables are introduced as interaction terms with attributes, and allow for the possibility that e.g. preferences for bioregions varies in some systematic way with age

- Latent class models: statistically it is assumed that there are a number of sub groups within the sample, and that within group preferences are homogenous, but they vary between groups.

- Random parameter/mixed logit models: the assumption that the parameter vector is fixed is relaxed, and instead it is assumed that across the individuals within the sample, preferences for each attribute are drawn from a distribution. This allows for heterogeneity but does not identify the source of these differences.

The random parameter model can be seen as a generalization of the latent class model, in so far as the number of classes is increased to the number of individuals. However, for identification, there has to a restriction imposed on the overall distribution (or functional form) of those preferences, which the latent class model does not impose.

The approach taken here is to estimate a random parameter model, with the parameters associated with the marine reserve features assumed to come from a normal distribution. Allowing the cost parameter to be random leads to issues of interpretation of the distribution of partworths (even if assumed to be log normal), and so it is restricted to be constant (Daly et al, 2012). Estimation of a random parameter model implies estimating the parameters describing that distribution. Typically these are the mean and standard deviation of the distribution. In this case we also allow for correlation across the random parameters, as its seems likely, a *priori*, that those who hold high preferences for one feature may also hold high preferences for others. We therefore estimate a full variance covariance matrix for the random parameters.

Table 8 reports the estimates of the aggregate sample (a formal test that the "Treatment" sub- samples can be restricted to the Aggregate confirms that the data can be combined (p=0.4596) for this extended model also), reporting first the estimates of the mean of the distribution, followed by the variance covariance estimates [variables 1-5 are those with random parameters: Cost and Sq are assumed to be fixed]. The appropriateness of using the random parameter formulation is shown by a formal test of the joint significance of the variance covariance effects (p=0.000). Two things are of interest from the variance covariance structure: all estimates of the covariance's are positive and significant (apart from the covariance between important sharkareas and key ecological features which is not significant). This suggests that those who value one feature highly will tend to value other features highly also (including shark areas). Secondly, the variance on the shark area feature is significant, implying that although the estimate of the mean of the distribution is not different from zero (0.046, p=0.506) there is heterogeneity within the sample, some of whom hold positive preferences, while others hold negative preferences. This flexibility of the random parameter model reveals a divergence in views on important areas for sharks, perhaps reflecting their dual status as a conservation related attribute and as a potential threat.

Table 8. Parameter estimates for the mixed logit model applied to the Aggregate data, with mean partworths. For random parameters estimates of the mean and variance covariance matrix are reported.

			Partworth (Mean)	
	Coeff	*P>|z|*		*P>|z|*
(1) Bioregions	0.103	*0.000*	11.95	*0.000*
(2) Sea Floor	0.069	*0.000*	8.08	*0.000*
(3) Ecol. Feat.	0.114	*0.000*	13.30	*0.000*
(4) Sharks	0.046	*0.506*	5.38	*0.572*
(5) Shallow	0.066	*0.000*	7.64	*0.002*
Cost	-0.0086	*0.000*		
Sq	-1.128	*0.000*	-131.233	*0.000*
Variance covariance estimates				
1:1	0.029	*0.001*		
2:1	0.018	*0.000*		
3:1	0.018	*0.007*		
4:1	0.035	*0.044*		
5:1	0.018	*0.000*		
2:2	0.014	*0.001*		
3:2	0.019	*0.000*		
4:2	0.022	*0.040*		
5:2	0.013	*0.000*		
3:3	0.032	*0.010*		
4:3	0.026	*0.136*		
5:3	0.017	*0.000*		
4:4	0.190	*0.011*		
5:4	0.032	*0.000*		
5:5	0.014	*0.000*		
Choices	9564			
Individuals	797			
LL	-2902.49			
Test of variance-covariance structure: $\chi^2_{(15)}$=371.13, p=0.0000				

Estimation of partworths is now more complex, given that each individual is assumed to hold a separate feature parameter. Table 8 reports partworths for each feature evaluated at the mean of the parameter distribution, and these are similar to those reported for the simple fixed parameter model (Table 7).

However, of additional interest is the distribution across the sample. It is possible to retrieve individual-specific estimates of the preference parameters implied by the estimates and the choices made by the individuals. From these it is possible to infer a distribution of partworths. These are reported in Figures 2a-2f.

The use of a normal distribution ensures that there may be some proportion of the sample that will hold values of the opposite sign to the average. Depending on the estimate of the mean and the variance of the distribution this may be a very small proportion, but formally one cannot rule out this outcome. Whether this is seen as an issue with the use of the normal distribution is driven by whether it is thought to be

infeasible for these preferences to exist (i.e. it is unlikely that people would gain utility by having less money, *ceteris paribus*), and pragmatically, the proportion of the sample where they exist.

In the current context, we do not rule out *a priori* the possibility that some people may find utility falls as the features increase: for example, they may not believe that increased shark feeding areas is a good thing if they are concerned about shark attacks. Alternatively they may believe that increased areas under protection may limit some of their own activities, or broader economic activities that they value, and hence feel that an expansion in protection will reduce their utility. In these circumstances it seems appropriate to allow a full range of preferences to be revealed.

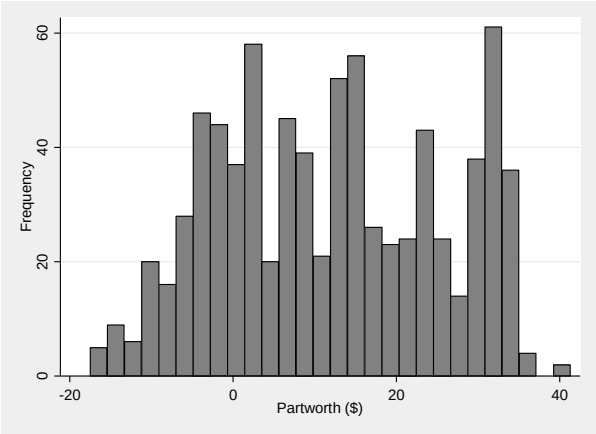

Figure 2a Bioregions

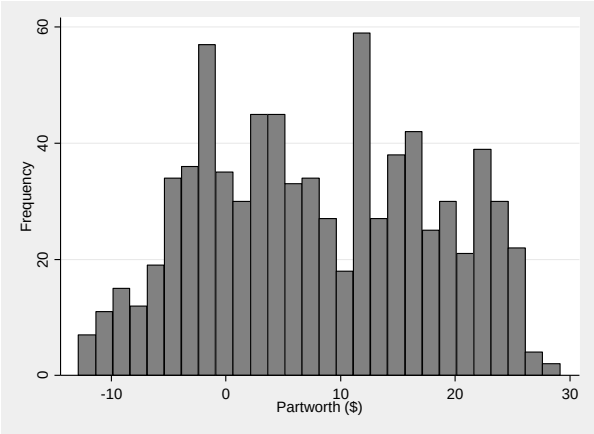

Figure 2b Seafloor types

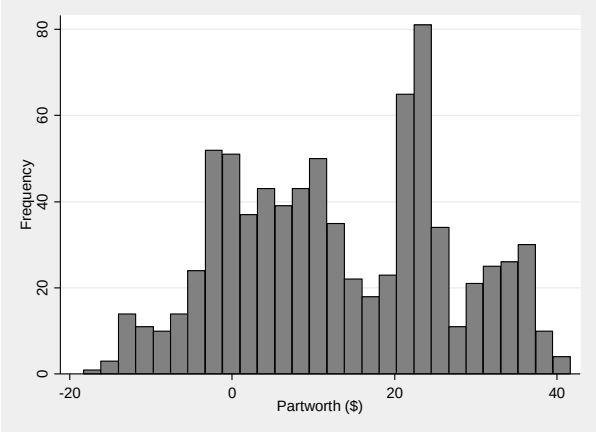

Figure 2c Ecological features

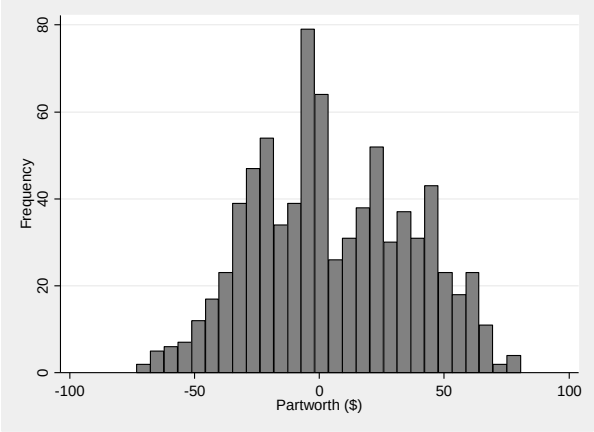

Figure 2d Sharks

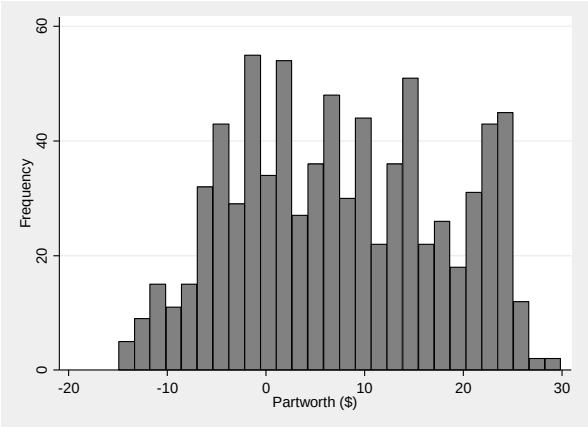

Figure 2e Shallow areas

Figure 2 Distribution of partworths by attribute (n=797)

Summary values for the distribution of partworths are given in Table 9 below. They suggest that although the means of the distribution are positive there are quite significant proportions of the sample that hold negative preferences for increases in protection levels.

Table 9. Summary values for partworth distributions

	Mean	*Median*	*%<0*
Bioregions	11.95	12.56	24
Sea Floor	8.07	7.60	27
Ecol. Feat.	13.26	12.10	20
Sharks	5.36	1.13	48
Shallow	7.63	6.91	28

There may be some interest in trying to identify the characteristics of the respondents that may explain the distribution of partworths. In conducting such an analysis one has to be aware of a number of caveats: most importantly one is explaining constructed data, generated by the mixed logit model. Thus one knows that, by construction, there will be correlation across the 5 partworths. Thus one should explicitly account for the panel nature of the data.

Table 10 reports an exploratory analysis of the estimated partworths data, using a random effects panel regression model. A separate fixed effect is included for each question, to reflect the difference in means of the distributions (measured as deviations from Bioregions, which is taken as the base). A search over possible explanatory variables found a limited number of respondent characteristics that systematically explain differences in partworths: partworths increase with age, and those who believe that the overall condition of Australia's marine ecosystems is worse than 10 years ago are prepared to pay more to increase protection.

The other variable that systematically affects values is the ranking of the importance of the protection of important areas for Great white sharks (p3x7_3 in Appendix 1). Respondents were asked to score this variable on a 5 point scale: it has been re-coded for the current analysis so that 'do not know'=0, important and extremely important as 1 and 2 respectively, and not really important and not important at all as -1 and -2 respectively. Higher scores for this variable were found to be associated with an increase in WTP for *all* attributes. One might expect that higher scores for this variable would correlate with WTP for protection of important shark areas, and it is the case that it has the greatest effect for sharks (WTP for a unit increase in the shark feature increases by approximately $8 for every unit increase in the shark protection variable) but what is more notable is that the attitude towards sharks also correlates with other values. This is the only species from the list of 12 species that were rated for which this occurs (see Question 3.6, Appendix 1 for the full set of species rated). What is also notable is that this effect is present even though individual specific effects are accounted for within the random effects model.

Table 10. Panel random effects model explaining WTP for the five marine reserve features.

	Coeff	*P>|z|*
Constant (base Bioregions)	4.53	0.003
Sea Floor	-2.88	0.000
Ecol. Feat.	1.45	0.040
Sharks	-11.65	0.000
Shallow	-3.56	0.000
Sharkprot x Bioregions	3.13	0.000
Sharkprot x Sea Floor	2.20	0.000
Sharkprot x Ecol. Feat	3.00	0.000
Sharkprot x Sharks	7.96	0.000
Sharkprot x Shallow	2.42	0.000
age	0.06	0.028
Condition of marine ecosystem (base DK)		
Better	-2.37	0.218
The same	-1.27	0.447
Worse	3.66	0.008
Observations	3980	
Individuals	796	
R-sq: within	0.1464	
between	0.1065	
overall	0.1177	

We further illustrate the implications of this result by estimating the WTP for each of the 5 attributes, for the 5 different levels of the shark protection variable (Table 11).

Table 11 . Estimated marginal WTP, as views towards protection of sharks varies

Value of Sharkprot	-2	-1	0	1	2
Bioregion	0.10	3.24	6.38	9.53	12.67
Sea Floor	-0.90	1.30	3.50	5.70	7.90
Ecol. Feat.	1.83	4.83	7.84	10.85	13.86
Sharks	-21.18	-13.22	-5.26	2.69	10.66
Shallow	-2.01	0.41	2.83	5.25	7.67

Evaluated at Age=30, marine ecosystem condition=DK

This suggests that those who viewed protecting great white sharks as not at all important held a negligible value for improvements across all other marine reserve features, as well as a strong negative value towards protection of important areas for white sharks. As that attitude moderated, values increased. The value for shark areas does not become positive until the respondent views sharks as important. Although the change in the value of shark area protection increases by the greatest magnitude, even those who hold shark protection as extremely important do not value an increase in protection for an area important to sharks as highly as an

additional bioregion or ecological feature under higher protection, and respondents value other reserve features before they value shark areas.

This suggests that attitudes towards the importance of protecting sharks might be taken as an indicator of the extent to which an individual values other features of the marine reserve network and of the broader marine ecosystem as a whole.

The results of the CE analysis reported here suggest some further avenues for research. It is possible to include socio demographic variables directly into the estimated model, and the insights reported in Table 10 suggest that may be a fruitful route. A limitation of the random parameter models reported here are that they are uni-modal. It is possible that there exist sub groups of the public with quite distinct preferences (i.e. who have a zero weight for attributes) which would imply mass points within the distribution. The partworth distributions in Figure 2 indicate this may be the case, which would suggest that further analysis using latent class models might be of value. However, what this initial analysis has revealed is that, generally, the sample values improvements in the protection of the features used in the choice experiment to characterise the SECMRN. There is also heterogeneity in values, with a significant proportion of respondents not holding positive values. The exception to this finding is increased protection to great white sharks, where the sample is more evenly split into those who value improvements and those who see this as a negative outcome. Marine reserve networks are not designed to protect individual species, but the attribute was included in the design to gain some insight into whether people attached greater importance to iconic species than the broader ecological features. The survey was also designed to test whether alternative ways of presenting information changed values, and in particular if information was given on the value of the network as a whole, whether that would shift attention away from the iconic species. This did not appear to be the case.

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7. APPENDIX 1 COPY OF THE SURVEY AND RESPONSES BY QUESTION

The following is a Word version of the online survey, Version 1 (text only), excluding the choice sets.

It reports the text, plus sample responses for each question. It also includes code names for each variable, as they appear in the associated data file. As such it can be used as a code book for the survey also.

1. **Part 1: General information:** Before we start the survey, we need to make sure we have a representative sample of respondents. Please answer the following questions.

1.1. Which State do you live in?

p1x1 n=1122	*%*
Victoria — metropolitan area	54.19
Victoria — regional area	18.45
South Australia — metropolitan area	18.09
South Australia — regional area	4.28
Tasmania— metropolitan area	1.96
Tasmania— regional area	3.03

1.2. How far from the coast do you live?

p1x2 n=1122	*%*
Less than 15km	40.64
15 to 50km	39.66
51 to 100km	10.34
Over 100km	9.36

1.3. How long have you been living in the South-east region (which includes South Australia, Victoria and Tasmania)?

p1x3 n=1122	*%*
Less than 1 year	1.87
Between 1 and 5 years	10.87
Between 6 and 10 years	8.91
More than 10 years	27.54
All my life	50.80

1.4. What is your gender?

p1x4 n=1122	*%*
Male	47.50
Female	52.50

1.5. What is your age?

p1x5 n=1222	*%*
18–24	16.31
25–34	16.31
35–44	18.36
45–54	15.24
55–64	16.76
65+	16.84
Prefer not to say	0.18

2. Part 2: Marine conservation

2.1 Do you think the protection of Australian *marine ecosystems** is an important issue?
Yes No

p2x1 n=1122	*%*
yes	95.10
no	4.90

**Include definition about marine ecosystems in pop-up box*

*An **ecosystem** includes all of the living things that interact with each other and their non-living environment in a given area.*

*A **marine ecosystem** consists of marine organisms (such as fish, mammals, crustaceans, corals, micro-organisms and algae), their different marine habitats (such as reefs or seagrass beds), as well as the network of interactions (including predator-prey relationships, nutrient cycles and energy flows).*

2.2 (If Yes in 2.1) Please select from the following the three (3) reasons that best reflect why you think it is important to protect Australian *marine ecosystems**. Indicate the most important reason as 1, the second most important reason as 2, and the third most important reason as 3.

I think it is important to protect Australian marine ecosystems: [randomise order]

{numbers of times selected as rank 1,2,3}

		1	2	3
Because humans need these ecosystems to live	*p2x2_1*	182	147	135
Because humans and other species in these ecosystems are all equally important	*p2x2_2*	168	181	173
So I can enjoy marine activities and/or other benefits derived from these ecosystems during my lifetime	*p2x2_3*	59	72	87
So marine industries can remain profitable	*p2x2_4*	45	44	67
So future generations can benefit from these ecosystems in the same way that we do today	*p2x2_5*	263	257	225
Because it is our moral responsibility to protect these ecosystems	*p2x2_6*	172	213	206
Because these ecosystems should continue to exist independent of any human consideration	*p2x2_7*	172	149	168
Other — please specify.	*p2x2_8*	3	1	3

2.3 (If Yes in 2.1) In the last 12 months, have you supported the protection of *marine ecosystems** through any of the following? You may select more than one box.

n=1067		*% Yes*
By volunteering your time	*p2x3_1*	4.22
Through financial subscription or donation	*p2x3_2*	8.25
By signing up to or voting for campaigns that promote protection of marine ecosystems	*p2x3_3*	12.65
By avoiding buying products that might damage marine ecosystems	*p2x3_4*	30.08
By buying products that raise funds for organisations that promote protection of marine ecosystems	*p2x3_5*	9.84
By trying to convince other people that it is important to protect marine ecosystems	*p2x3_6*	11.72
Other — please specify:	*p2x3_7*	1.03
None of these	*p2x3_8*	50.23

2.4 Do you feel that overall the condition of Australia's *marine ecosystems** is better, the same or worse than 10 years ago?

p2x4 n=1122	*%*
Don't know	22.10
Better	10.52
The same	19.25
Worse	48.13

2.5 Do you feel that overall the condition of Australia's *marine ecosystems** will be better, the same or worse in 10 years from now?

p2x5 n=1122	*%*
Don't know (1)	22.10
Better (2)	10.52
The same (3)	19.25
Worse (4)	48.13

2.5.1 (If (4) in 2.5) Why do you think this is the case? You may select more than one box.

N=475		*%Yes*
Not enough commitment from policy makers and politicians	*p2x5x1_1*	61.47
Not enough commitment from the general population	*p2x5x1_2*	48.00
Because of the impact of commercial marine-based activities (such as fisheries, port development and tourism)	*p2x5x1_3*	56.00
Because of the impact of non-commercial marine-based activities (such as recreational fishing and boating)	*p2x5x1_4*	23.37
Because of offshore mining activities	*p2x5x1_5*	38.95
Because of pollution	*p2x5x1_6*	73.47
Because of climate change	*p2x5x1_7*	52.21
Other — please specify	*p2x5x1_8*	1.47

2.6 In your opinion, what are the most important local threats to the health of *marine ecosystems** in the South-east marine region (area in blue on map below)? You may select more than one box.

Figure 3: The South-east marine region (Adapted from Department of Environment)

Image: SE marine region.png

n=1122		*%*
Commercial fishing	*p2x6_1*	52.85
Offshore mining	*p2x6_2*	37.08
Recreational fishing	*p2x6_3*	11.23
Coastal pollution from human activities	*p2x6_4*	67.74
Other— please specify:	*p2x6_5*	3.12
I see no particular threat to marine ecosystems in the South-east marine region	*p2x6_6*	3.12
Don't know	*p2x6_7*	10.78

2.7 In the last three months, have you seen anything about marine parks around Australia in the media?

p2x7 n=1122	*%*
No	52.85
Yes	23.35
Unsure	23.80

3. Part 3: South-east Commonwealth Marine Reserves Network

3.1 Have you heard about Commonwealth Marine Reserves?

p3x1	*%*
Yes (1)	23.08
No (2)	57.13
Unsure (3)	19.79

3.1.1 (For all answers in 3.1, provide following information). Please read carefully.

Commonwealth Marine Reserves are areas established and managed by the Australian Government to protect the oceans that surround Australia. These reserves are situated in Commonwealth waters, which extend between 5.5 km and 370 km off the coast.

Commonwealth Marine Reserves are different from State Marine Reserves, which are established and managed by state governments and are situated in state waters, which are within 5.5km from the coast.

(If (1) or (3) in 3.1) Did you learn anything new about Commonwealth Marine Reserves from what you just read? You may select more than one box.

n=481		*%yes*
No, I knew everything already	*p3x1x1_1*	8.52
Yes, I did not know about the location of Commonwealth Marine Reserves	*p3x1x1_2*	50.73
Yes, I did not know the difference between State and Commonwealth Marine Reserves	*p3x1x1_3*	57.59

3.2 Do you think the creation of Commonwealth Marine Reserves is a good thing?

p3x2 n=1122	*%*
Yes (1)	75.22
No (2)	3.48
Unsure (3)	21.30

3.2.1 (If (2) in 3.2) Why do you think it is not a good thing? You may select more than one box.

N=39		*% yes*
I think marine reserves are not a useful way to protect *marine ecosystems**	*p3x2x1_1*	25.64
I think State Marine Reserves are already enough to protect *marine ecosystems**	*p3x2x1_2*	43.59
I think Australian *marine ecosystems** are healthy enough	*p3x2x1_3*	23.08
I think the government should spend money on other things	*p3x2x1_4*	25.64
Other — please specify:	*p3x2x1_5*	7.69

3.2.2 (If (3) in 3.2) Why do you think it is not a good thing? You may select more than one box.

N=239		*%yes*
I am not sure about the usefulness of marine reserves to protect *marine ecosystems**	*p3x2x2_1*	42.26
State Marine Reserves might already be enough to protect *marine ecosystems**	*p3x2x2_2*	22.18
I am not sure if we need these extra marine reserves because Australian *marine ecosystems** might be healthy enough	*p3x2x2_3*	18.83
I think the government should spend money on other things	*p3x2x2_4*	23.01
Other — please specify:	*p3x2x2_5*	10.88

3.3 Have you heard about the South-east Commonwealth Marine Reserves Network?

p3x3 n=1122	*%*
Yes	7.66
No	92.34

3.3.1 (If Yes in 3.3) How did you hear about it? You may select more than one box.

N=86		*% yes*
Australian Government Department of Environment website	*p3x3x1_1*	39.53
Other website (Please specify:___)	*p3x3x1_2*	3.49
Television (Please specify:___)	*p3x3x1_3*	5.81
Articles in the newspaper	*p3x3x1_4*	38.37
Radio news or talkback	*p3x3x1_5*	29.07
Brochure (Please specify:___)	*p3x3x1_6*	0.00
Community or other non-government organisation interested in oceans (Please specify:___)	*p3x3x1_7*	2.33
Friend or relative	*p3x3x1_8*	29.07
Workshop/conference/meeting (Please specify:___)	*p3x3x1_9*	1.16
Public consultancy about the reserve network	*p3x3x1_10*	4.65
Education (e.g. course at college or university)	*p3x3x1_11*	10.47
Other — please specify:	*p3x3x1_12*	2.33

3.3.2 (If Yes in 3.3) Which of the following most accurately reflects your opinion about each of the statements about the South-east Commonwealth Marine Reserves Network? (show in random order)

Q3x3x2x1 n=86	*%*
There are not enough restrictions on commercial fishing in the reserves	
I agree, there are not enough restrictions	55.81
I disagree, the level of restriction is appropriate	23.26
I disagree, the level of restriction is too high	6.98
I do not know	13.95

Q3x3x2x2 n=86	*%*
There are not enough restrictions on mining in the reserves	
I agree, there are not enough restrictions	52.33
I disagree, the level of restriction is appropriate	29.07
I disagree, the level of restriction is too high	5.81
I do not know	12.79

Q3x3x2x3 n=86	*%*
There are not enough restrictions on recreational activities in the reserves	
I agree, there are not enough restrictions	53.49
I disagree, the level of restriction is appropriate	24.42
I disagree, the level of restriction is too high	9.30
I do not know	12.79

Q3x3x2x4 n=86	*%*
The level of protection given to these reserves is not enough to guarantee conservation of marine ecosystems	
I agree, the level of protection is too low	65.12
I disagree, the level of protection is appropriate	19.77
I disagree, the level of protection is too high	5.81
I do not know	9.30

Q3x3x2x5 n=86	*%*
There is not enough enforcement of restrictions in reserves to guarantee protection of marine ecosystems	
I agree	73.26
I disagree	12.79
I do not know	13.95

3.3.3 (If Yes in 3.3) Are you familiar with the different restrictions on activities in the South-east Commonwealth Marine Reserves Network?

p3x3x3 n=86	*%*
Yes, I know the restrictions on activities quite well	31.40
I have heard about the different restrictions on activities but do not know them well	52.33
No, I don't know anything about this	16.28

The South-east Commonwealth Marine Reserves Network is a group of fourteen (14) Commonwealth Marine Reserves. It covers marine areas from 5.5 km to 370 km off the coast, and stretches from the far south coast of New South Wales, around Tasmania and Victoria and west to Kangaroo Island off South Australia. Here is a map of the Marine Reserves Network (note that the Macquarie Island reserve, which lies to the South of Tasmania, is not shown in this map).

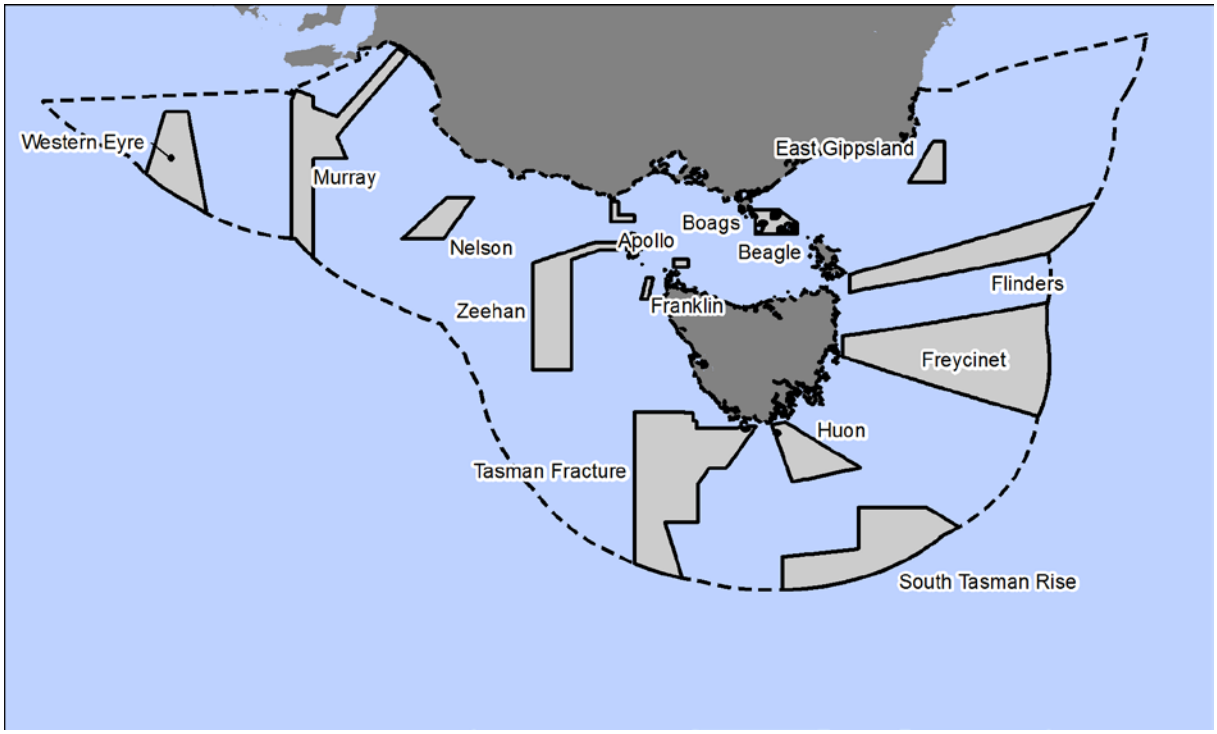


Figure 2: The South-east Commonwealth Marine Reserves Network (Adapted from Department of Environment)
Image: reserves with names.png

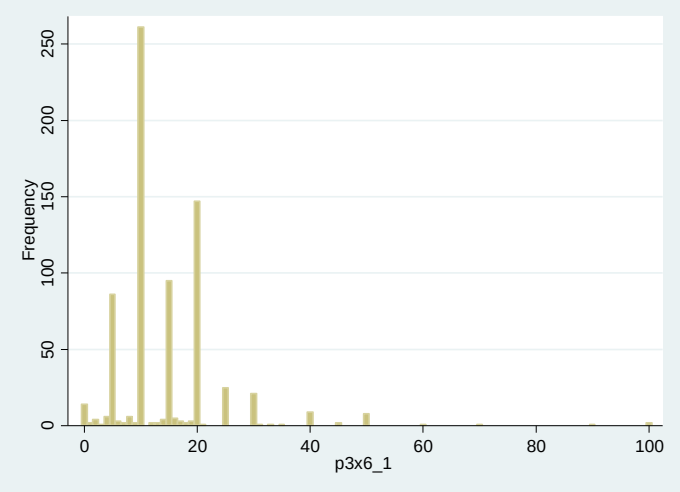
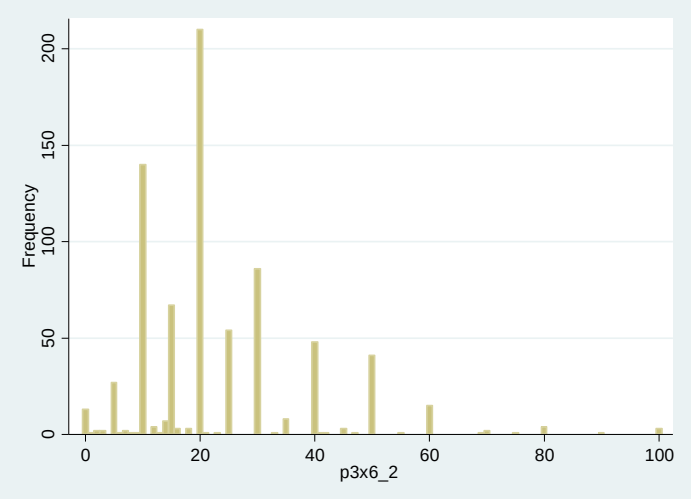
Which of the following statement best describes you at this time?

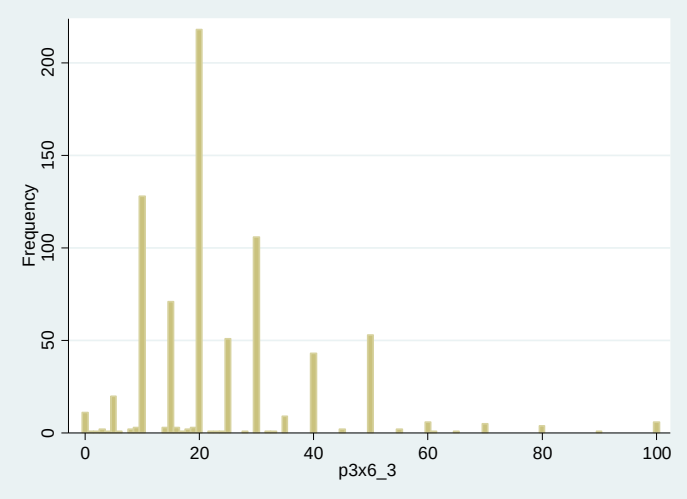
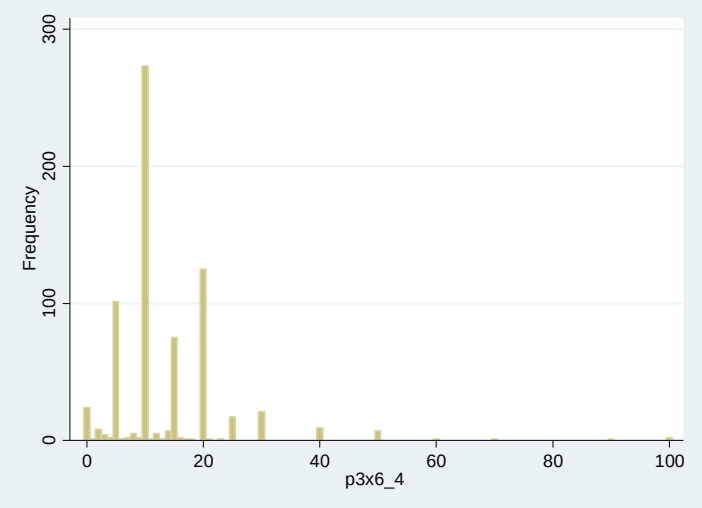
p3x4 n=1122	*%*
I know nothing at all about the marine ecosystems covered by the South-east Commonwealth Marine Reserves Network	68.00
I know a little bit about the marine ecosystems covered by South-east Commonwealth Marine Reserves Network	26.02
I know a moderate amount about the marine ecosystems covered by the South-east Commonwealth Marine Reserves Network	4.72
I know a lot about the marine ecosystems covered by the South-east Commonwealth Marine Reserves Network	1.25

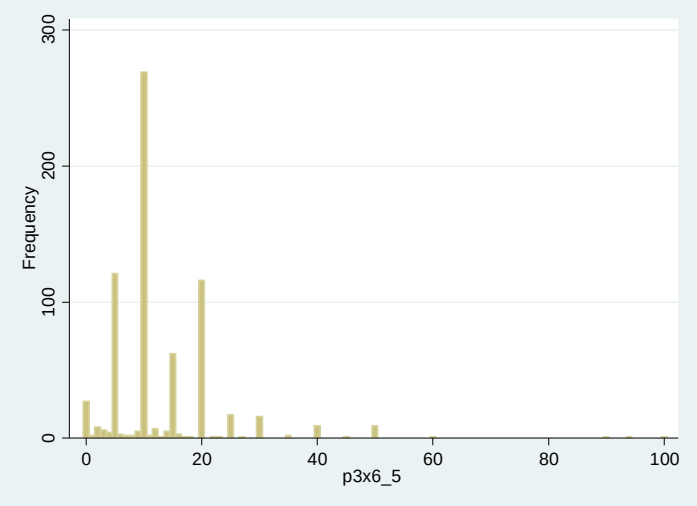
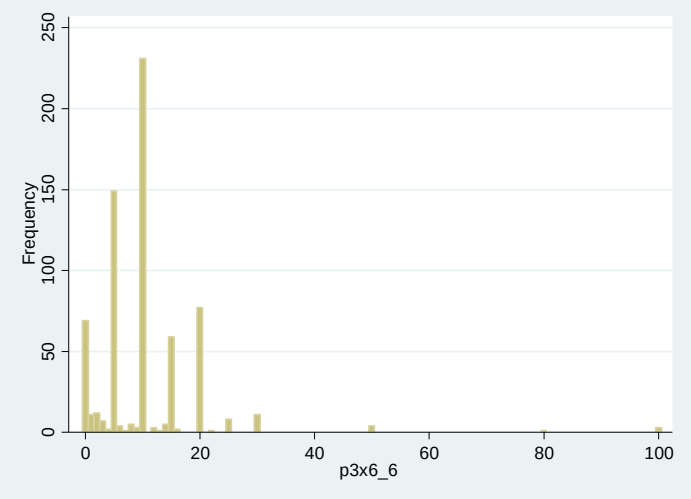
3.4 The South-east Commonwealth Marine Reserves Network contains some cultural and heritage sites (e.g. shipwrecks, sites of Aboriginal significance). Do you think these are important to protect?

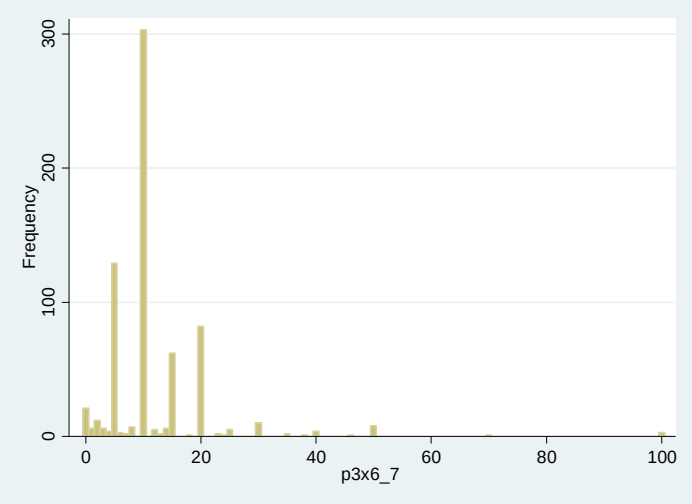
p3x5 n=1122	*%*
Yes, they are more important to protect than marine ecosystems	10.96
Yes, they are as important to protect as marine ecosystems	45.72
Yes, but they are less important to protect than marine ecosystems	28.52
No	4.55
Do not know	10.25

3.5 The South-east Commonwealth Marine Reserves Network was established by law in 2007. It is now the responsibility of the Australian Government to manage the network. Here is a list of the management objectives for the network. In your opinion, which are the most important ones? Please allocate a total of 100 points among the following (the more points you give to an objective, the more important you think it is): [randomize order]

(1) Improve scientific knowledge of the marine ecosystems protected by the network	 Mean=13.1
(2) Protect the marine ecosystems of the network by minimising impacts of human activities (such as commercial fisheries, mining, recreational fishing and other recreational activities) through management zones in the network	 Mean=21.8

(3) Protect the marine ecosystems of the network against environmental incidents (such as introduction of marine pests, oil and chemical spills)	 Mean=23.0
(4) Ensure the enforcement of the management of the network	 Mean=11.8

(5) Improve public knowledge about the network and promote stakeholder participation in the management of the network	 Mean=11.5
(6) Support involvement of Indigenous people in management of the network	 Mean=8.6

(7) Evaluate the effectiveness of the network management (through monitoring and review)	 Mean=10.2	
(8) I don't want to answer this question	p3x6dk	N=320

3.5.1 (If (8) in 3.6) Why not? You may select more than one box

N=320		*%*
Don't know enough about the subject	*p3x6x1_1*	88.13
This does not concern me	*p3x6x1_2*	8.13
This is a question for scientists, managers and other stakeholders to answer, not me	*p3x6x1_3*	10.00
Other — please specify:	*p3x6x1_4*	1.25

3.6 The following is a list of some of the species that can be found in the South-east Commonwealth Marine Reserves Network. Please state for each species how important you think it is to protect it

N=1122		Extremely important	Important	Not really important	Not important at all	Do not know
Whales (such as blue, humpback, killer or fin whales)	*p3x7_1*	54.55	36.45	3.48	0.71	4.81
Deep-sea sharks (such as gulper sharks)	*p3x7_2*	31.28	50.71	8.20	2.23	7.58
Great white sharks	*p3x7_3*	32.44	47.24	10.87	3.21	6.24
Plankton (including phytoplankton and zooplankton – tiny plants and animals)	*p3x7_4*	45.72	41.71	5.53	1.16	5.88
Jellyfish	*p3x7_5*	18.54	44.39	22.01	5.70	9.36
Pelagic fish (such as southern bluefin tuna and sardines)	*p3x7_6*	41.62	47.24	4.37	0.62	6.15
Sponges and soft and hard corals between 40 and 200m deep	*p3x7_7*	35.83	49.82	6.33	1.52	6.51
Seabirds (such as albatrosses, petrels, gannets, terns, cormorants, gulls, penguins)	*p3x7_8*	38.41	49.20	5.53	0.98	5.88
Dolphins	*p3x7_9*	52.85	38.50	3.03	0.62	4.99
Seals and sea-lions	*p3x7_10*	43.14	45.63	4.72	1.34	5.17
Deep sea (depth >200m) sponges, sea whips and corals	*p3x7_11*	34.94	49.82	6.95	1.07	7.22
Deep sea (depth >200 m) fish (such as basketwork eels and orange roughy)	*p3x7_12*	32.44	50.80	7.93	1.34	7.49

4. Part 4: Marine activities

4.1 Do you participate in the following marine activities?

N=1122				
		No, Never	Yes, but not often	Yes, often
Commercial fishing	*p4x1_1*	91.09	7.58	1.34
Commercial tourism (including charter fishing or diving)	*p4x1_2*	84.58	13.73	1.69
Other marine commercial activities (e.g. oil and gas, aquaculture)	*p4x1_3*	93.40	4.99	1.60
Recreational fishing	*p4x1_4*	60.61	33.96	5.44
Other recreational activities (scuba, snorkeling, sightseeing, sailing)	*p4x1_5*	57.93	37.43	4.63
Indigenous customary use	*p4x1_6*	92.78	5.53	1.69

4.2 Here is the map of the South-east Commonwealth Marine Reserves Network. The 14 individual Commonwealth Marine Reserves appear in blue. The network area covers water depths from 40 m to 4600 m, and starts around 5.5 km from the shore.

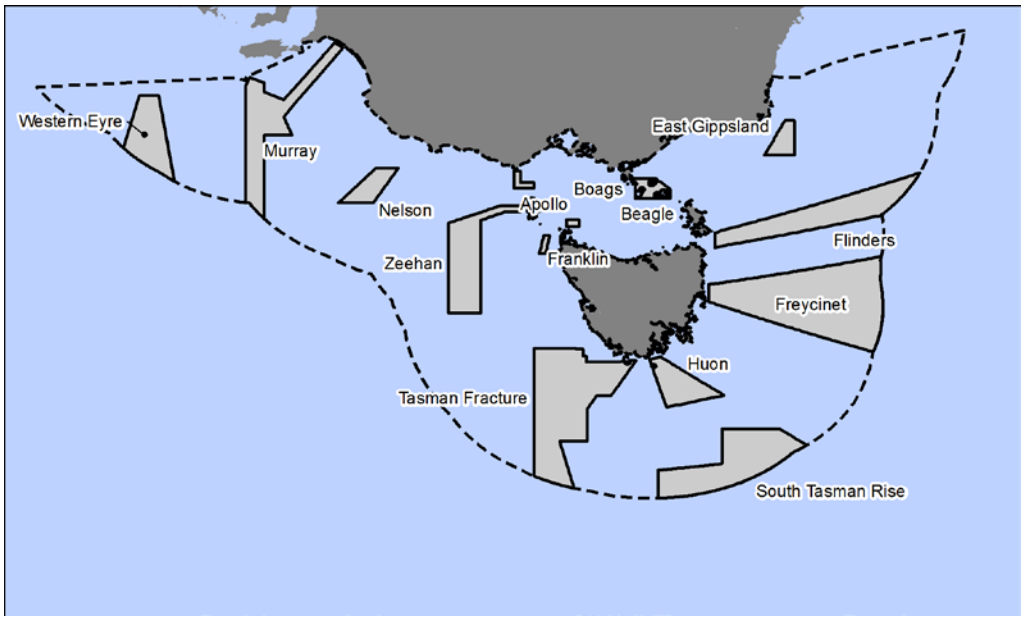


Figure 3: The South-east Commonwealth Marine Reserve Network (Adapted from Department of Environment) note that the Macquarie Island reserve, which lies to the South of Tasmania, is not shown in this map *Image: reserves with names.png*

To the best of your knowledge have you ever been in a marine reserve that forms part of the South-east Commonwealth Marine Reserves Network?

p4x4 n=1122	*%*
Yes (1)	21.21
No (2)	78.79

4.2.1 (If (1) in 4.2) How frequently do you visit any marine reserve in the network for the following activities?

N=43		Number of positive responses			
		n	Less than once per year	1 or 2 times per year	3 or more times per year
Commercial fishing	*p4x2x1_1*	40	22	13	5
Commercial tourism (including charter fishing or diving)	*p4x2x1_2*	61	38	19	4
Other marine commercial activities	*p4x2x1_3*	35	14	16	5
Recreational fishing	*p4x2x1_4*	115	58	46	11
Other recreational activities (scuba, snorkeling, sightseeing, sailing)	*p4x2x1_5*	136	74	46	16
Indigenous customary use	*p4x2x1_6*	39	18	16	5

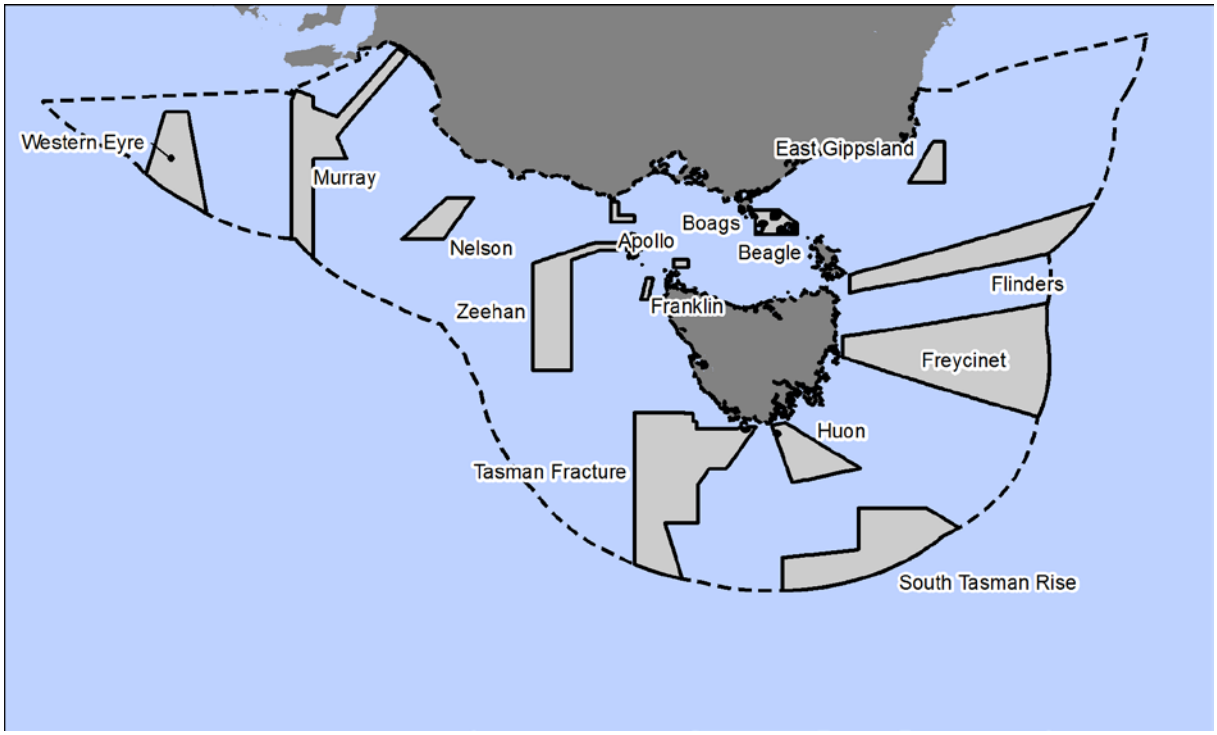


Image: reserves with names.png

4.2.2. (If (1) in 4.2) Please indicate which marine reserves you most often visit for each of the following activities?

	Variables names are defined as p4x2x2_i_j *% Yes*						
		Commercial fishing	Commercial tourism (including	Other marine commercial activities	Recreational fishing	Other recreational activities (scuba,	Indigenous customary use
	j	***1***	***2***	***3***	***4***	***5***	***6***
i		*N=40*	*N=61*	*N=35*	*N=115*	*N=136*	*N=39*
1	Murry	27.50	22.95	11.43	21.74	19.85	15.38
2	Nelson	27.50	11.48	14.29	9.57	4.41	10.26
3	Zeehan	20.00	4.92	14.29	1.74	0.74	10.26
4	Franklin	30.00	1.64	11.43	5.22	7.35	17.95
5	Tasman Fracture	15.00	6.56	17.14	3.48	3.68	7.69
6	South Tasman rise	7.50	4.92	2.86	5.22	2.94	7.69
7	Huon	5.00	3.28	2.86	5.22	7.35	2.56
8	Freycinet	15.00	9.84	11.43	9.57	11.76	7.69
9	Flinders	30.00	24.59	22.86	14.78	15.44	23.08
10	East Gippsland	22.50	36.07	28.57	23.48	24.26	17.95
11	Beagle	17.50	9.84	11.43	6.96	7.35	7.69
12	Apollo	22.50	24.59	25.71	18.26	25.74	23.08
13	Boags	7.50	8.20	8.57	13.04	16.91	2.56

Part 5: Preferred management intensity for the South-East Commonwealth Marine Reserves Network

Read the following sections carefully. You will need this information to help you answer questions later on.

Features and Management Zones of the South-east Commonwealth Marine Reserves Network

You will be able to return to this information at any time by clicking on the "Features & Management Zones" link at the bottom of the screen *{ pdf document provided containing info below}.*

The South-east Commonwealth Marine Reserves Network aims to protect the features of the marine environment within its boundaries. It does this using *management zones* within reserves which provide varying levels of protection.

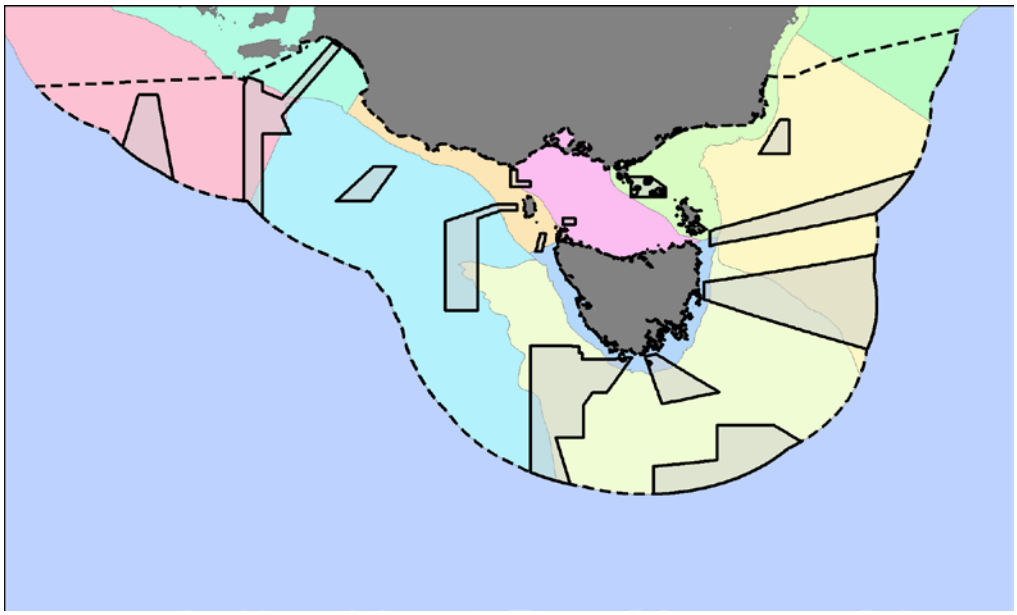
- **Highly protected zones** do not allow mining, mooring, commercial or recreational fishing activities. Only low-impact tourism (e.g. nature watching, scuba and snorkeling tours)and scientific research is permitted.
- **Protected zones** allow many types of human activities, but these activities are monitored and require permits. For example, mining, boat mooring, and commercial or recreational fishing are generally allowed but subject to approval. Trawling is not allowed.

Five (5) features in the South-east marine region which have been identified as important by scientists and managers, and occur in protected and highly protected zones in the South-east Commonwealth Marine Reserves Network, are:

Feature 1: Bioregions

A bioregion is a large geographical area covering similar types of marine ecosystems. There are nine (**9**) different bioregions in the South-east marine region. Having reserves in each bioregion is important to guarantee that each type of marine ecosystem is protected.

Current situation: All **9** bioregions are represented in reserves, and **4** of those bioregions are also represented in highly protected zones.



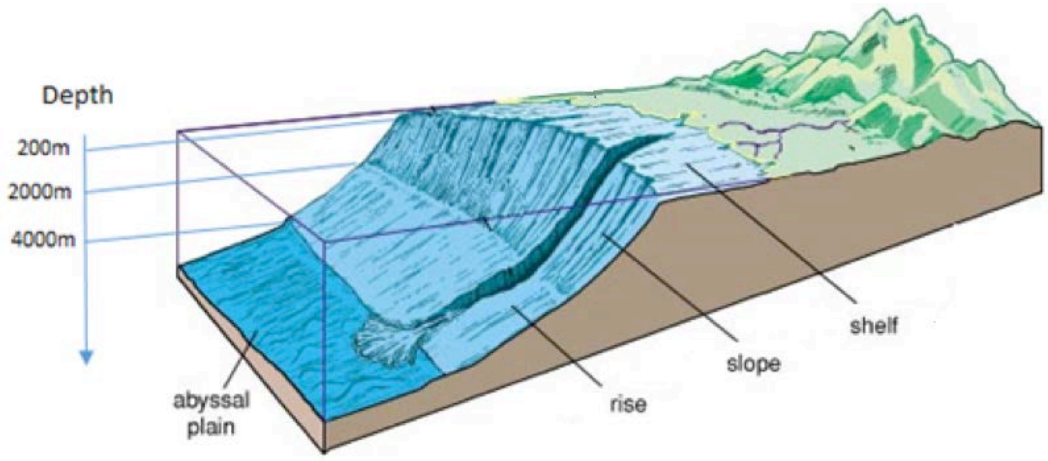
Bioregions in the South-east of Australia and Commonwealth Marine Reserves

Image: bioregions with reserves.png

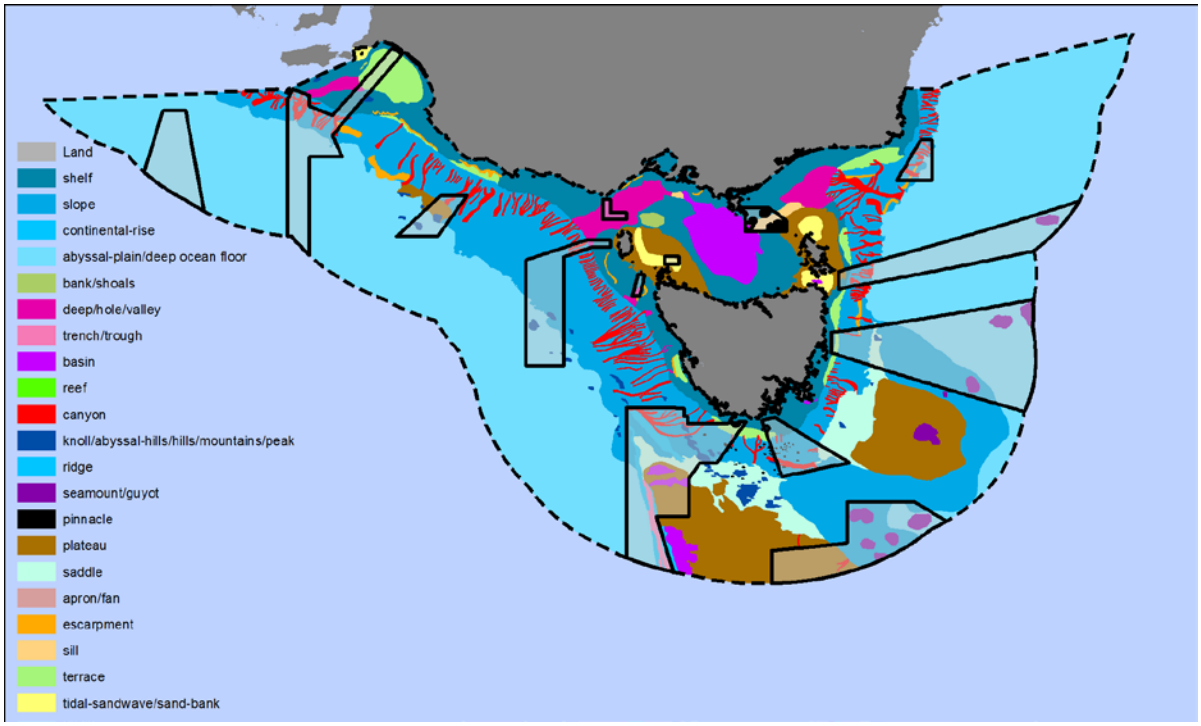
Feature 2: Seafloor types

Seafloor types refer to differences in the bottom of the ocean. Similar to landforms such as mountains, rivers and plains on land, seafloor types represent structures and gradients that support different groups of species. There are fourteen (**14**) different seafloor types in the South-east region. Having the different seafloor types and their associated species included in marine reserves is important to guarantee their protection from activities such as mining, oil and gas prospecting, or some types of fishing.

Current situation: all **14** seafloor types are represented in reserves, and **7** seafloor types are also represented in highly protected zones.



Some examples of seafloor types in the South-east marine region



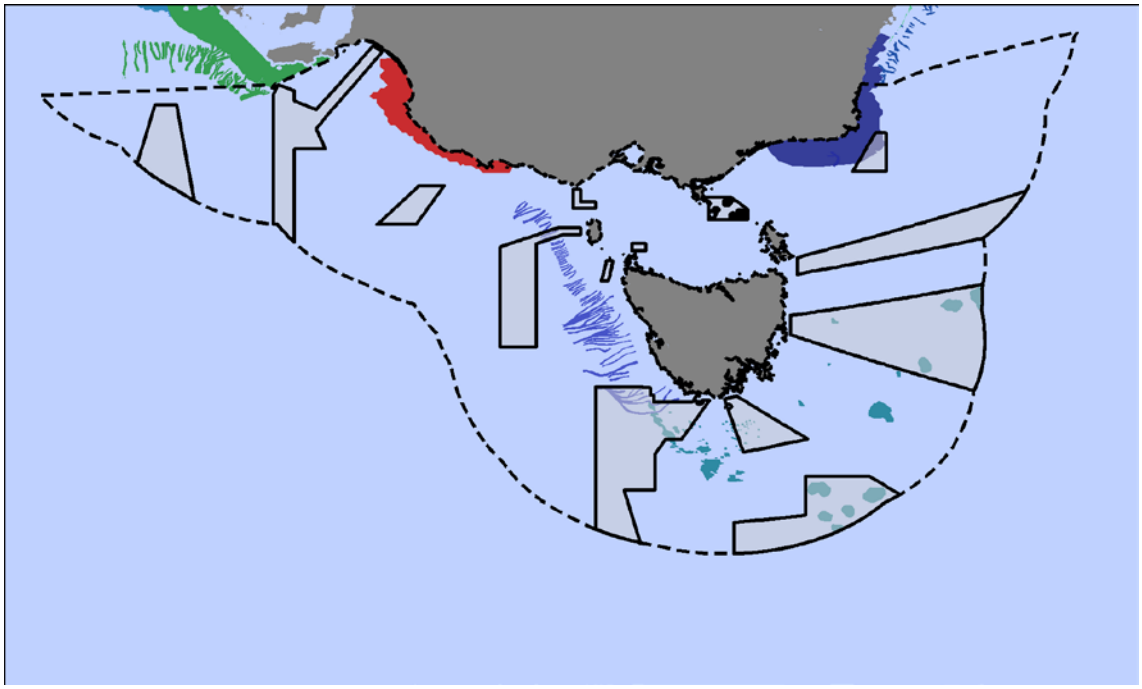
Seafloor types in the South-east of Australia and Commonwealth Marine Reserves

Image: sea floor types with reserves .png

Feature 3: Important ecological areas

Important ecological areas refer to areas that play a key role in the productivity and species diversity of marine ecosystems. Examples of these are canyons, seamounts and other high productivity areas where nutrient-rich water occurs supporting many different species. There are eight (**8**) important ecological areas in the South-east region. Having these areas included in marine reserves can help preserve their special ecological function.

Current situation: all **8** important ecological areas are represented in reserves, and **4** are also represented in highly protected zones.



Important ecological areas in the South-east of Australia and Commonwealth Marine Reserves

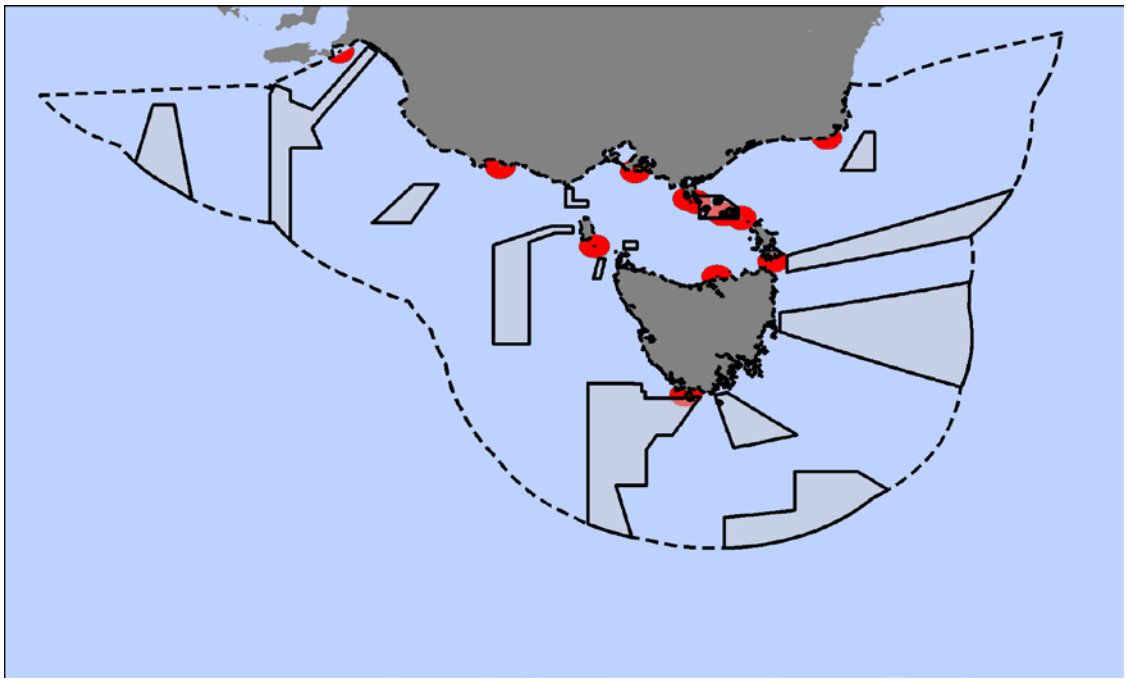
Image: ecological areas with reserves.png

Feature 4: Important areas for White shark populations

The White shark is a top predator that contributes to the health of marine ecosystems. The great white shark is listed as vulnerable under Australian law. A long-term decline in abundance of White sharks in Australian and international waters has been observed.

There are ten (**10**) major feeding areas of White sharks in the South-east region. Including these feeding areas in marine reserves can help maintain current population levels, by reducing any conflicts with other marine uses.

Current situation: **3** of the 10 major feeding areas are represented in reserves, and **1** of these is also in highly protected zones.



Major shark feeding areas in the South-east of Australia and Commonwealth Marine Reserves

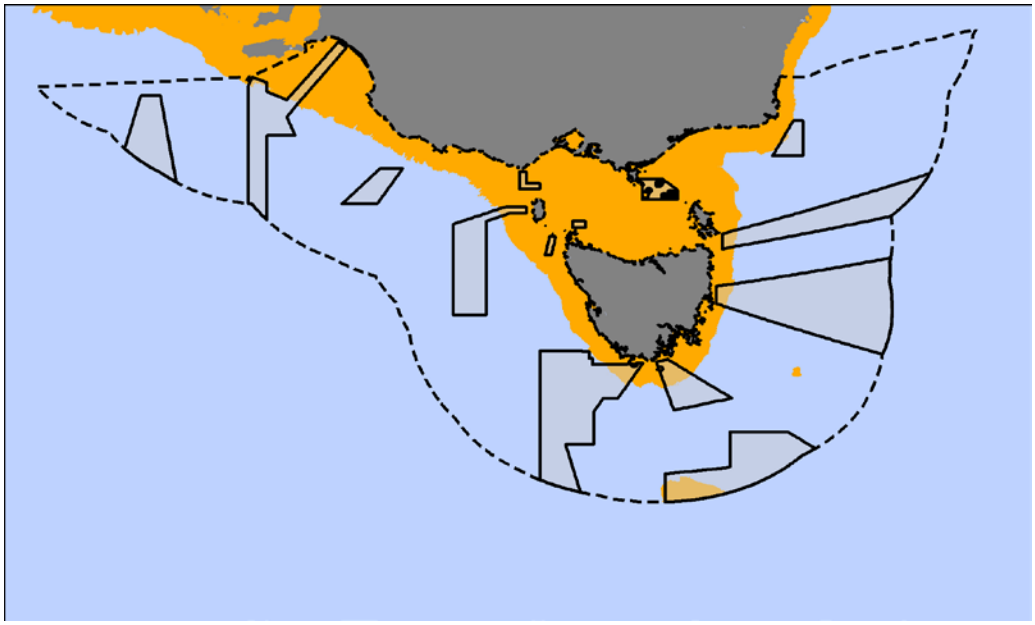
Image: GWS with reserves .png

Feature 5: Areas less than 1500m depth

Areas shallower than 1500m typically have the greatest biodiversity, and they are also where the greatest level of human activity (such as fishing, mining, recreation and shipping) occurs.

Having these high biodiversity areas included in reserves plays a significant role in protecting marine ecosystems.

Current situation: **10%** of the total area less than 1500m deep is in a marine reserve, with **1%** of the total also in highly protected zones.



Areas less than 1500m deep in the South-east of Australia and Commonwealth Marine Reserves

Image: shallow with reserves.png

Enhancing protection in the South-east Commonwealth Marine Reserves Network

Investment in management measures in protected zones can be targeted to improve the conservation outcomes for individual features; such measures can include, for example, requiring additional codes of practise; monitoring and scientific research; communication and awareness programs. In that way the level of protection can be raised so that it is highly protected.

We will now ask you to choose between different options for managing the South-east Commonwealth Marine Reserves Network. These options may lead to better or worse conservation outcomes for each of the 5 features.

We will ask these questions of a large number of people so we can identify how the community feel about the protection level of the five features. The findings from this study will be made publicly available and may provide information about community values that can be useful for marine reserves managers in Australia. This means that your choices are important, so please take time to answer as accurately as possible.

You will be presented with seven choices, each between two different management options. Each option would result in different conservation outcomes for each of the 5 features. The way we represent these changes is the extent to which the features are present in protected zones or highly protected zones. You will be asked to indicate which of the two options you prefer.

The options will also vary in the cost to you, which will be met by an increase in individual income taxes. The increased tax will apply every year for a period of ten (10) years.

You need to be mindful of your own financial circumstances — that is consider the limit of how much you can realistically afford given your current household income and personal expenses.

Example of a choice question:

Consider the following two options. Assuming these are the only options available to you, which one would you choose? Click here for a link to the description of the features.*{with link to pdf}*

Features in the reserve network	Option 1	Option 2
Of **9** bioregions…	**4** contain zones with high protection level	**2** contain zones with high protection level
Of **14** seafloor types…	**7** can be found in zones with high protection level	**9** can be found in zones with high protection level
Of **8** important ecological areas…	**4** are partly covered by zones with high protection level	**6** are partly covered by zones with high protection level
Of **3** important areas for White sharks…	**1** is partly covered by a zone with high protection level	**1** is partly covered by a zone with high protection level
% of areas less than 1500m depth in protection zones (**10%** in total)	**1%** is covered by zones with high protection level	**5%** is covered by zones with high protection level
Additional cost to you each year, *for **10** years*	$0	$300

How to answer:

The first column will be the same in each choice question and describes the situation in which only the current zoning protection is provided, with no additional cost. In other words no additional management measures are used for any of the features. The alternative option reflects changes in the level of investment that is being made in different reserves, so that the extent to which the feature is present in the highly protected zones changes. These may increase or fall. It also has a cost to you.

For example, Option 1 has 4 bioregions that contain high protection zones, while the alternative option has only 2 bioregions that contain high protection zones However, the number of seafloor types that can be found within zones with high protection increases from 7 to 9.

Choose your most preferred option based on the assumption that these are the only options available to you.

Remember to choose an option you can afford, given the cost each year.

Each scenario should be treated independently — that is, you don't need to remember the choices you make from one scenario to the next or think about what choices might be coming next.

Then randomly assigned to one of 4 blocks, each block containing 6 of these choice sets.

Part 5: (Questions about the choice experiment)

We are now going to ask you some questions about the choice experiment you have just completed.

5.1 Please indicate how certain you were of the answers you gave to the management choices

p5x1 n=1122	*%*
Not certain at all (1)	7.31
Not really certain (2)	36.19
Quite certain (3)	48.66
Very certain (4)	7.84

5.2 If "Current situation" is selected in all of your choice sets)

Why? You may select more than one box

n=345		*% yes*
I am happy with the current South-east Commonwealth Marine Reserves Network	*p5x2_1*	17.10
I do not want to pay an additional cost	*p5x2_2*	72.17
The choices were confusing	*p5x2_3*	14.20
The experiment was too complex	*p5x2_4*	15.07
I did not have sufficient information or knowledge to make such choices	*p5x2_5*	24.93
Scientists or managers should make such choices, not me	*p5x2_6*	16.52
The outcomes were irrelevant to me	*p5x2_7*	8.12
Others. Please specify:	*p5x2_8*	6.09

5.3 Did you find the choices unrealistic?

p5x3 n=1122	*%*
Yes(1)	17.11
No(2)	42.07
Unsure(3)	40.82

5.4 Did you find it difficult identifying your preferred option?

p5x4 n=1122	*%*
Yes, very difficult (1)	7.93
Yes, difficult (2)	19.70
Yes, a bit difficult (3)	44.56
No, it was easy (4)	27.81

5.4.1 (If (1), (2) or (3) in 5.4) Why did you find it difficult? You may select more than one box.

N=808		*%yes*
The choices were confusing	p5x4x1_1	21.53
The choices were too complex	p5x4x1_2	34.78
I did not have sufficient information or knowledge to make such choices	p5x4x1_3	51.61
Scientists or managers should make such choices, not me	p5x4x1_4	21.78
The outcomes were irrelevant to me	p5x4x1_5	3.96

5.5 Did you consider the cost to you when making your choices?

p5x5 n=1122	*%*
Yes, all the time	52.05
Yes, sometimes	36.36
No, I ignored it	6.95
Unsure	4.63

5.6 Did you ignore any of the five features protected by the network when making your choices?

p5x6 n=1122	*%*
Yes (1)	13.28
No — I did not consistently ignore any of the features in making my choices (2)	86.72

5.6.1 (If (1) in 5.6) Which feature(s) did you ignore? You may select more than one box.

N=149		*%*
Bioregions	*p5x6x1_1*	37.58
Important Ecological Areas	*p5x6x1_2*	32.21
Seafloor Types	*p5x6x1_3*	46.98
White shark feeding areas	*p5x6x1_4*	40.27
Areas less than 1500m depth	*p5x6x1_5*	34.23

5.7 How interesting did you find the information that was provided to you about the five features protected by the network (select one):

p5x7 n=1122	*%*
Very interesting (1)	24.87
Interesting (2)	61.41
Not interesting (3)	13.73

5.8 How much did you learn about the South-east Commonwealth Marine Reserves Network and/or the *marine ecosystems** it protects from the information that was provided to you in this survey?

p5x8 n=1122	*%*
I learned a lot (1)	34.58
I learned a bit (2)	55.61
I didn't learn much (3)	7.31
I didn't learn anything (4)	2.50

5.9 What aspects of the South-east Commonwealth Marine Reserve Network would you like to receive more information about? You may select more than one box.

N=1122		*%*
The ecosystems and species protected (1)	*p5x9_1*	38.06
Level of protection (zoning) and management strategies (including enforcement) (2)	*p5x9_2*	25.22
Objectives of the reserves network and associated management (3)	*p5x9_3*	18.36
Socio-economic impacts (costs and benefits) of reserves network (4)	*p5x9_4*	22.91
Effectiveness of the network and its management in protecting marine ecosystems (5)	*p5x9_5*	28.79
Effectiveness of the reserves network and its management in guaranteeing sustainable commercial activities (mining, fisheries, tourism) (6)	*p5x9_6*	18.18
Other — please specify: (7)	*p5x9_7*	0.80
Don't want any (8)	*p5x9_8*	36.27

5.9.1 (Unless (8) in 5.9) In what ways would you prefer to get the information? Please select up to three (3) preferred options among the following.

N=715		*%*
1. Through the Australian Government Department of Environment website	*p5x9x1_1*	39.30
2. Through dedicated Internet site	*p5x9x1_1*	42.24
3. Television	*p5x9x1_1*	48.39
4. Free brochures and factsheets sent to your home	*p5x9x1_1*	32.45
5. Social media	*p5x9x1_1*	24.20
6. Workshop/conference/meeting organised by marine reserve management agency	*p5x9x1_1*	4.90
7.Workshop/conference/meeting organised by community or other non-government agency interested in oceans	*p5x9x1_1*	4.20
8. Other — please specify:	*p5x9x1_1*	1.68

Part 6: And finally, some questions about you:

6.1 Please indicate your highest level of education attained

p6x1 n=1122	*%*
Secondary	33.78
College certificate	12.30
Diploma or Advanced Diploma	13.10
Bachelor Degree	25.49
Graduate Diploma or Graduate Certificate	5.08
Postgraduate Degree	8.91
Other — please specify:	1.34

6.2 Do you have more than 1 year of work experience in any of the following areas? You may select more than one box.

N=1122		*%*
Natural resource/environmental management	*p6x2_1*	1.69
Coastal and marine management	*p6x2_2*	1.52
Commercial Fisheries sector	*p6x2_3*	2.32
Recreational Fisheries sector	*p6x2_4*	2.85
Marine Tourism sector	*p6x2_5*	1.60
Other commercial activities (e.g. oil and gas, aquaculture)	*p6x2_6*	1.43
None of these	*p6x2_7*	90.91

6.3 Do you earn any income from marine based activities?

p6x3 n=1122	*%*
Yes	2.05
No	97.95

What is the current combined household income of everyone in your household, before tax or anything else is taken out? Please include pensions and allowances from all sources.

p6x4 n=1122	*%*
Under $15,600 a year (Under $300 a week)	5.79
$15,600-$25,999 a year ($300-$499 a week)	10.70
$26,000-$36,399 a year ($500-$699 a week)	8.73
$36,400-$51,999 a year ($700-$999 a week)	14.71
$52,000-$77,999 a year ($1,000-$1,499 a week)	16.67
$78,000-$103,999 a year ($1,500-$1,999 a week)	13.55
$104,000-$129,999 a year ($2,000-$2,499 a week)	6.15
$130,000-$149,999 a year ($2,500-$2,899 a week)	4.10
$150,000 or more per year ($2,900 or more a week)	3.48
Prefer not to say	16.13

6.4 Please let us know your overall opinion on this survey. You may select more than one box.

N=1122		*%*
Too complicated	*p6x5_1*	22.10
Too long	*p6x5_2*	14.08
Covers an important topic	*p6x5_3*	52.23
Interesting	*p6x5_4*	39.57
Informative	*p6x5_5*	33.51

If you have any comment about the questionnaire or the survey, feel free to write them in the following box:

Thank you for your participation!

8. APPENDIX 2 DROPOUT RATES BY SURVEY VERSION AND QUESTION

The table below shows the dropouts from the survey. The question number identifies the last question/page that the respondent was observed at. A brief description is given of notable points.
Versions 2 and 3 had a video test at the start of the survey, to check respondents computer setup. In those surveys a large number are seen to leave at VideoSee. Its unclear if this is due to technical issues with their computer setup or if they nominated to exit the survey on seeing that videos would be involved. The cumulative number and cumulative % are reported having ignored these initial values, as we are more interested in where they leave during the substantive survey, and if there are differences across versions because of the content.

The first major step point occurs at question p3x6, which required respondents to allocate 100 points across alternative management objectives, which is potentially a cognitively challenging task, although there was an optout.

The next major step is at section 5, the major introduction of the features of the CMR. Its notable that version 1, with text, has double (21) the number of loses compared to versions 2 and 3 (13 and 9 respectively). Loses within the choice sets are relatively small, given the task, and post choice sets negligible.

Completed surveys are 1122 (370,372,380) and given the dropout numbers (after VideoSee) of 143 (48, 52, 43) completion rates for all those who entered is 89% (89%,88%,90%), which is very high.

		original values			cumulative, removing VideoSee			cumulative %, removing VideoSee		
	Total	V1	V2	V3	V1	V2	V3	V1	V2	V3
Total	204	48	88	68	48	52	43	48	52	43
VideoSee	61	0	36	25						
Intro and attitudes towards marine conservation										
p2x1	3	1	0	2	1	0	2	2	0	5
p2x2blank	12	5	3	4	6	3	6	13	6	14
p2x3	1	0	0	1	6	3	7	13	6	16
p2x4	1	0	1	0	6	4	7	13	8	16
p2x6	4	0	2	2	6	6	9	13	12	21
SE marine reserves										
p3x1	1	0	1	0	6	7	9	13	13	21
p3x1Intro	2	1	0	1	7	7	10	15	13	23
p3x2	1	1	0	0	8	7	10	17	13	23
p3x2x2	1	0	0	1	8	7	11	17	13	26
p3x4	4	0	2	2	8	9	13	17	17	30
allocating 100 points										
p3x6	19	6	8	5	14	17	18	29	33	42
Marine activities										
p4x1	1	0	1	0	14	18	18	29	35	42
p4x2	1	0	0	1	14	18	19	29	35	44
p4x2x2	7	2	2	3	16	20	22	33	38	51
introduction to choice										

experiment										
part5Intro	2	0	1	1	16	21	23	33	40	53
part5v1Intro	21	21	0	0	37			77		
video1Play	1	0	0	1		21	24		40	56
part5v2_3Video2Intro	1	0	1	0		22	24		42	56
video2Play	20	0	12	8		34	32		65	74
choice sets										
choiceExample	18	5	6	7	42	40	39	88	77	91
b1sc2	1	0	1	0	42	41	39	88	79	91
b1sc4	2	0	2	0	42	43	39	88	83	91
b1sc5	1	0	0	1	42	43	40	88	83	93
b1sc6	3	1	2	0	43	45	40	90	87	93
b2sc1	2	1	1	0	44	46	40	92	88	93
b2sc3	1	0	1	0	44	47	40	92	90	93
b2sc5	2	0	2	0	44	49	40	92	94	93
b3sc1	3	3	0	0	47	49	40	98	94	93
b3sc2	1	0	0	1	47	49	41	98	94	95
b3sc5	1	0	1	0	47	50	41	98	96	95
b4sc3	1	0	0	1	47	50	42	98	96	98
b4sc4	2	1	1	0	48	51	42	100	98	98
b4sc5	1	0	1	0	48	52	42	100	100	98
opinion of survey										
p6x5	1	0	0	1	48	52	43	100	100	100

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