



Assessing public awareness of marine environmental threats and conservation efforts



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A B S T R A C T

To successfully integrate and engage the general public into marine conservation decisions it is important that individuals are well informed. This study surveyed two sample groups, marine environmental professionals working in the UK, $n = 61$, and members of the public surveyed in Truro, Cornwall, UK, $n = 71$. Public awareness of marine environmental threats and conservation efforts was assessed through comparison with the, assumed well informed, professional sample. Findings suggest that the public are generally well informed of threats to the marine environment, but are significantly less well informed about marine conservation and management strategies. Furthermore, despite indicating concern for the marine environment, members of the public display significantly fewer pro-environmental behaviours than marine conservation professionals. Public knowledge (and action) gaps are discussed as well as how these may be minimised, including a more interdisciplinary and active approach to science communication and public engagement.

1. Introduction

The need for more effective conservation management of global marine ecosystems is urgent. Alleviating major global threats such as over-fishing, pollution, habitat destruction and climate change is vital to ensure continued key ecosystem services [1]. Recent research suggests a more integrative approach to ecosystem management alongside increasing public engagement could be key factors in the development of effective marine conservation initiatives [2–7]. Previous work in terrestrial ecosystems has shown that stakeholder engagement, particularly with local people, can have substantial positive implications for the success of conservation projects [8,9].

Among more conventional stakeholder groups such as marine conservation professionals, resource users, and recreational users, the public also have a role to play in management decisions [10,11]. A suggested approach to better engage the public is the concept of marine citizenship [12,13]. This calls for all individuals to realise their personal responsibility for the oceans, and for an increased public role in marine conservation and management decisions. Through improved environmental education and information availability, members of the public would be more informed of the threats to the marine environment and current management strategies. Thus gaining a stronger sense of responsibility for the marine environment [13]. Personal associations with the marine environment are also thought to influence an

individual's values. Experiences such as holidays or recreational use of coastal areas increase individual attachment to, and sense of responsibility for, the marine environment [12,13]. There is uncertainty, however, among marine conservation and management professionals about the 'real world' application of this model. The inclusion of such a diverse stakeholder group is likely to increase decision making time and result in a greater degree of compromise. Additionally, it is thought that the public could be misinformed, leading to the support of ineffective, short-sighted or unsustainable courses of action [13].

Research has shown that the public are concerned and interested in the marine environment [14]; but often lack robust knowledge of the severity of threats facing the marine environment and what is being done to conserve and sustainably manage it. In the UK, many people believe that the local marine environment is not home to many charismatic or interesting species [15]. Furthermore, people are not aware of the impact their personal actions such as recycling, picking up litter and consumer choices can have on the marine environment [16]. As a result, the values held by the British public may reflect more positively on the marine environment should they be better informed about the charismatic local fauna, the threats they face and what is being done to help [13–16].

This study brought together these concepts through analysis of public awareness and opinion. Through comparison with an informed sample, this study addresses three core aims: (1) investigation of public

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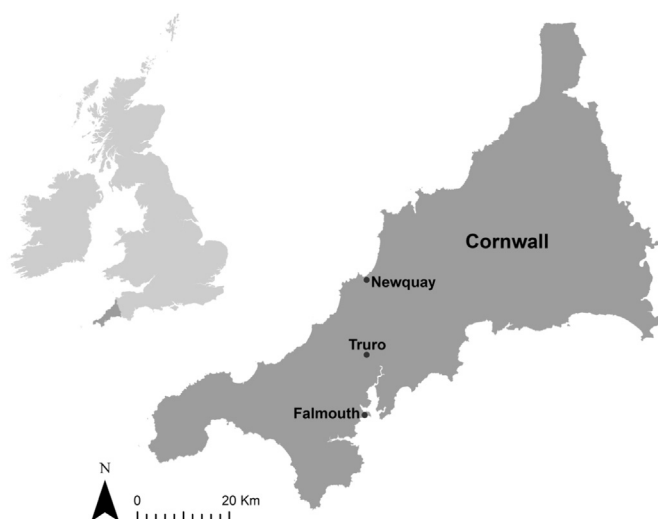


Fig. 1. Map showing location of Truro, Cornwall, UK.

awareness of key aspects of marine environmental management and identification of any gaps in knowledge; (2) analysis of what sources are used in order to gain information on the marine environment, and whether this influences perceptions; and (3) investigation of the pro-environmental behaviours and actions individuals undertake to minimise their negative impact on the marine environment.

2. Materials and methods

2.1. Study site

Throughout November and December 2014, members of the public ($n = 71$) were surveyed using questionnaires. Truro, Cornwall, UK (Fig. 1) was the principle study site, due to its proximity to the marine environment and local maritime culture. Due to its majority coastal boundary, Cornwall has strong historical links with the marine environment for resources and trade. Therefore, the marine environment has cultural significance throughout the county and not just in coastal towns. Truro city has a higher proportion of permanent residents than surrounding towns such as Falmouth and Newquay [17].

Therefore this sample is likely to be more representative of the general public in Cornwall by reducing the proportion of respondents who have specifically chosen to live or holiday in an area close to the marine environment by owning a second home. Undertaking survey data collection during winter months ensured a more representative sample as there are fewer visitors at this time. It is important to note that this study was carried out in Cornwall, a county with strong cultural links and reliance on the marine environment. Cornwall has a large and varied fishing fleet as well as reliance on tourism income based on a healthy coastal environment. Marine conservation news is prevalent within local communities, and environmental organisations such as 'Surfers Against Sewage' and the 'Cornwall Wildlife Trust' have a large public presence. It is likely the level of awareness displayed by this sample may be higher than a sample of public from communities further from the coast [18].

2.2. Surveys

One researcher carried out all surveys to ensure consistency in delivery and recording of responses. Questions were asked without prompts. If any further explanation was required, care was taken to ensure additional information was given consistently to each participant. Prompts were given from an objective, informed perspective to minimise influence on responses. On approach, the survey topic was not

disclosed before individuals had agreed to participate; this helped reduce participation bias. Single persons were approached to ensure responses were that of the respondents and less likely to be influenced by other people. The final response rate from public surveys was 22.5%. In order to recognise heterogeneity within the general public, social scientists use the term '*the publics*'. It is important in social studies to highlight the differences among groups and individuals as many hold different ideals and values; and therefore are likely to respond differently to situations and messages. However, for the purposes of the ecological and conservation nature of this study, this sample group has been, and will continue to be, referred to as '*the public*'.

A comparable sample of marine environmental professionals were surveyed through the online survey website 'Survey Monkey'. A pre-selected list of professionals were contacted personally via email with a link to the online survey. Professionals were selected based on their work within the marine environment. Individuals working in non-governmental organisations (NGOs), charities, advisory bodies such as the JNCC, research and academic institutions were all approached. Snowball sampling was used to increase the reach of the survey amongst professionals [19]. At the end of the survey respondents were asked to provide details of other persons who may be contacted or simply to distribute as they saw fit. 74 professionals were contacted personally by the researcher but the number of secondary distributions are unknown. 63 responses were received over a 2 week period, 61 of which were complete and used in analysis.

2.3. Questionnaire structure

2.3.1. Overall concern and action taken

The question "*How concerned are you about marine environmental issues?*" was the first of the survey. This was used to gain an insight into how concerned individuals perceive themselves to be generally. The perceived level of concern was likely to change as individuals were pressed to think more in depth about specific threats and conservation efforts throughout the survey. Therefore by asking this question first, responses were more likely to reflect a participants 'true' level of concern.

Subsequent questions were asked to ascertain how participants felt they altered a series of behaviours as a result of their concern for the marine environment. Consumer choices, plastic and waste management, holiday and leisure activities and voting preferences were analysed. This allowed for the presence of any 'value-action gap' to be evaluated. A value-action gap exists where individuals express pro-environmental opinions and high levels of concern but fail to translate these opinions into pro-environmental actions; creating a gap between values and actions [20]. The selected behaviours are believed to reflect four major lifestyle components that have the potential to impact on the natural environment [21–24].

2.3.2. Information sources and memorable issues

The source of information can be important in shaping ideals and opinions [25], particularly in environmental issues. This study investigated to what extent there is a disparity in the sources used by professionals and the public to gather information on marine environmental issues; and whether this is reflected in their perceptions and awareness of threats and management. Due to the ease of access of perhaps more 'unreliable' and 'sensationalist' sources of information through mainstream media (televised, radio, printed and online news reports) and social media, it has been proposed that the public receive unreliable information on the severity of threats to the marine environment [26]. By asking participants what sources they most commonly access to gain environmental information, as well as asking them to name three marine environmental issues they can remember from the past five years, this study aimed to investigate the role of information sources in informing and influencing the public.

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