Public perceptions of the UK marine environment

R.L. Jefferson [a,b,*], I. Bailey [b,c], D. d'A. Laffoley [d], J.P. Richards [e], M.J. Attrill [b]

[a] Centre for Marine and Coastal Policy Research, Plymouth University, Drake Circus, Plymouth, PL4 8AA, UK
[b] Marine Institute, Plymouth University, Drake Circus, Plymouth, PL4 8AA, UK
[c] School of Geography, Earth and Environmental Sciences, Plymouth University, Drake Circus, Plymouth, PL4 8AA, UK
[d] IUCN (International Union for Conservation of Nature), 28 rue Mauverney, CH-1196 Gland, Switzerland
[e] Open Polytechnic, 3 Cleary Street, Lower Hutt, New Zealand

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ABSTRACT

The damaging effects of human activities on marine health suggest that a major shift is required in the way marine systems are used by individuals. Identifying how to engage society in this shift is an on-going debate. This includes strengthening the positive connections between society and the sea. This study uses a survey ($n = 1047$) to investigate UK public perceptions of subtidal species and marine health to assess whether it is possible to build more positive connections between society and the sea. Respondents showed considerable interest in traditionally charismatic species (puffins, seals and seahorses) although many respondents thought these species did not live in UK seas. Gender and experience of marine environments influenced public perceptions of species. Public perceptions of marine health showed issues such as litter to be considered as the greatest indicator of poor health. Ecological concepts of habitat integrity and biodiversity were also rated as important to marine health. Social values were found to influence public perceptions of marine health. The results show that perceptions are far from uniform across the population, and such diversity of perceptions is likely impact upon methods to catalyse societal engagement with marine conservation. These findings reinforce previous research on public perceptions of UK seas, and identify opportunities for building positive connections between society and the sea. Research priorities to further the debate of engaging society with the sea are identified.

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1. Introduction

Marine systems provide many services essential to human life [1] yet the everyday activities of individuals are degrading the health of marine systems and undermining their ability to provide vital services [2,3]. This has prompted increasing recognition of the need to engage society and deliver behaviour changes as part of the solution to marine conservation issues [4–7]. An over-arching goal for marine conservation and the driving force of any marine behaviour change is to achieve healthy marine environments. From an ecological perspective, a healthy ecosystem can be defined, like a healthy human body, as a system which functions well and is able to resist or recover from disturbance [8]. Quantifiable components of this are vigour (the activity, metabolism or primary productivity of an ecosystem), organisation (biodiversity, food web and biophysical structure of an ecosystem), resistance to disturbance (its ability to maintain structure and functions under stress) and resilience (the ability of the system to recover from a disturbance). These ecosystem attributes are widely accepted as underpinning ecosystem health [9–12].

A number of concepts have been proposed to engage society with the sea to deliver marine health, including marine citizenship [13] and the 'Shallow Seas' approach [6] but questions of how to realise the outcomes of these concepts abound [14,15]. Connecting society with the sea presents a significant challenge to delivering marine conservation goals and requires an understanding of social values, attitudes and knowledge [14]. Overcoming this challenge has been cited as a national and global research priority and an area which requires urgent attention [14,16,17]. This research is occurring, however greater support and focus is required to advance this newly developing field. This paper contributes to this debate through presenting the results of a nationally representative investigation of public perceptions of the United Kingdom (UK) marine environment. More specifically, this study investigates public perceptions of subtidal UK marine species and public understanding of marine health. Socio-demographic and social values variables are known to affect perceptions of issues, and their influence is assessed in this study.

The paper begins with a review of marine health, existing research on engaging society with behaviour change, the implications for marine behaviour changes, and previous studies on public

* Correspondence to: Reynolds Building, SMSE, Plymouth University, Drake Circus, Plymouth, PL4 8AA, UK. Tel.: +44 1752 586 167; fax: +44 1752 584 950.
E-mail addresses: rebecca.jefferson@plymouth.ac.uk (R.L. Jefferson), ibailey@plymouth.ac.uk (I. Bailey), danlaffoley@btinternet.com (D.d'A. Laffoley), jonathan.richards@adjunct.openpolytechnic.ac.nz (J.P. Richards), m.attrill@plymouth.ac.uk (M.J. Attrill).

perceptions of the marine environment. The methods describe the survey format and delivery, and the results report the findings of the survey. The discussion considers the key themes related to public perceptions of marine species and marine health and the conclusion identifies priority research themes needed to continue to the debate into engaging society with the sea.

2. Background

2.1. Understanding societal engagement with the environment

Extensive research has already been conducted into behaviour changes to achieve public health, safety and environmental benefits which can inform strategies to engage society with marine issues [18]. Understanding how behaviour change occurs has improved considerably from early "knowledge deficit models", which argued that environmentally detrimental behaviours occur because individuals are unaware of the effects of their behaviours, and thus, that behaviours could be changed simply by 'supplying knowledge'. This has repeatedly been shown to be a simplification of the processes influencing behaviour change [19] and it is now recognised that many variables, such as values, emotions and enabling infrastructure, can influence behaviour choices [20]. This paper focuses on understanding values, which are known to have a strong effect on behaviour, with different values leading to different behavioural responses. Environmental values are of particular importance, as they underpin the way individuals interpret and engage with environmental issues [21]. By understanding the values of a target audience, it is possible to identify the different motivations that may cause individuals to perform a particular behaviour.

Factors which influence environmental values are also indirectly related to behaviour. Personal experience of an environment or environmental issue has been found to have a considerable effect on environmental values and behaviour. Experiences can facilitate stronger emotional connections to natural environments, which in turn can increase the willingness of the person to protect that environment [22,23]. Maiteny [24] describes the positive effects of emotional involvement as essential to sustained pro-environmental values and behaviours. Indeed, the need to reconnect people with nature is considered as one of the current priorities for conservation biology, ensuring that behavioural change is rooted in a connection to the wider environment [25].

In addition to the values of the audience, the way in which messages are framed is known to influence engagement. Issues framed with negative emotions, such as fear and loss, portray a 'doom and gloom' atmosphere which translates into fatalism and powerlessness among audiences, leading to disengagement rather than connection [26,27]. Research has repeatedly shown that building positive associations and personalising benefits is more potent in eliciting potential behaviour change than a focus on negative impacts [28]. This implies that the development of positive connections between individuals and the sea may be necessary to successfully engage society marine conservation issues.

A range of variables are thought to influence individual behaviour patterns and choices which therefore need to be measured when conducting surveys of public perceptions. Socio-demographic variables can be measured through standard questions of age, gender, education, etc. the results of which can be relatively easily communicated to conservation practitioners and those who implement behaviour change and engagement campaigns. Measuring social values is more difficult, and the science of values is more complex, necessitating explanation to the practitioner audience, in order for research findings to be applied to engagement campaigns. Social segmentation models are tools which enable a person's values to be measured, identified, and

categorised, thereby providing an opportunity to investigate how these factors influence behaviours or perceptions [29]. These models provide a method for assessing social values, within a framework which can be used to communicate findings to practitioners. A number of social segmentation models exist. This study uses the Maslow Group method which provides an easily applied method, and allows the results of this study to build on those upon previous studies that used this method [30,31].

2.2. Connecting society and the sea

Although our existing understanding of how society engages with environmental issues can inform the debate on how to engage society with the marine environment, the specific nuances of marine engagement must also be better understood because marine environments are manifestly different in character, positioning, and cognition. A particular challenge in achieving increased and higher quality public engagement with marine issues is the spatial and cognitive disconnection between society and 'the sea'. 'The sea' is seen as something 'far away' by many people, and its benefits and impacts can appear distant. Marine conservation issues are also complex as they are driven by a range of human activities which cause a variety of impacts on complex systems, at a range of temporal and spatial scales [3]. Additionally, there is limited knowledge of the behaviour changes that would deliver most environmental benefit, and there is little direct feedback to the individual about the environmental benefits their behaviour change may create. Public disconnection from environmental issues is evident in a range of other policy domains, however this has not precluded societal behaviour changes. For example, climate change is complex, but a focus on specific behaviours (such as energy consumption) and wider links to prominent concerns (such as energy security), help to overcome the disconnect [32]. Campaigns to conserve priority species which live far from the campaign's target audience can successfully raise money for their cause, however, donating money perhaps represents a relatively simple behavioural response [33]. The characteristics of the marine environment, and the existing knowledge, attitudes and values of the audience act as a filter through which society interprets engagement attempts. Disconnection in other contexts may be easier to overcome than the barriers which cause disconnection for marine issues, therefore, the specific characteristics of marine environmental engagement must be recognised in order to understand how they influence potential behaviour change.

2.3. Public perceptions of the marine environment

In order to catalyse public engagement for marine conservation outcomes, ecologically defined marine health goals need to resonate with public audiences. Existing research on public perceptions of the marine environment does not provide a societal definition of marine health, and currently does not identify how to connect ecological and societal perspectives of marine health. Relatively little research has investigated public perceptions of the marine environment and those studies which do exist have been often focused on negative components of marine conservation such as threats to marine health, and on measuring public concern [34,35]. Additionally, most research on connections between society and the sea has focused on the coastal or intertidal space, consequently little is known about connections to subtidal environments. Evidence supports strong positive public associations with the UK coast: over 18 million UK residents took seaside holidays in 2010 [36] and 63% of the public considered visiting the coast important to their quality of life (National Trust Coastal Values Survey, Pers. Comms). Such positive associations are often connected to personal experiences, but opportunities to make