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Status of management effort in 153 marine protected areas across the English Channel

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ABSTRACT

A conceptual framework was developed for assessing the sub-level of protection in 185 multiple-use marine protected areas (MPAs) in the English Channel through a survey on management effort. Data were retrieved from 153 MPAs: 4.56% were assigned low management effort, 83.70% were assigned medium management effort, and 11.76% were assigned high management effort. Overall, French MPAs performed better in terms of management effort than English MPAs and lack of consistency in ratings by different management bodies in England was found. Lack of correlation between management effort and conservation status within an available subset of 13 MPAs suggests that management may not be as influential a factor for the effective conservation of MPAs, especially in marine environments under heavy human pressure such as the English Channel. It is suggested that MPAs in such areas may therefore require an upgrade of their legal level of protection to be effective.

1. Introduction

MPAs have been primarily advocated for the conservation of marine biodiversity and the cultural features and ecosystem services it provides (Dudley, 2008; Bennett and Dearden, 2014). Several studies have demonstrated the ecological benefits of MPAs (Gubbay, 2006; McClanahan et al., 2006); in particular, highly restrictive no-take marine reserves have been shown to provide higher ecological benefits when compared to multiple-use MPAs (Coleman et al., 2013; Sciberras et al., 2013a; Guidetti et al., 2014). This suggests that there is an important effect of the level of protection on the ecological performance of MPAs (Coleman et al., 2013; Edgar et al., 2014) which may not only compromise effective conservation at the site level, but also the ecological coherence of an MPA network (Sciberras et al., 2013b). In some studies the term 'level of protection' has been used to refer to legal protection; *i.e.* regulations defining no-take vs multiple-use MPAs (Sciberras et al., 2013a; Roberts et al., 2010). Other studies have used 'level of protection' to refer to different stages of the protection process, ranging from legal designation to management through to enforcement (Guidetti et al., 2014). Here, we propose a conceptual framework to discriminate 'level of (legal) protection' from 'sub-level of (managerial) protection' or 'management effort'.

Whilst legal protection measures, such as the requirement of environmental impact assessments or licensing of particular activities, may help to prevent or limit the impact of some potentially damaging and destructive anthropogenic activities on the marine environment, they are unlikely to provide the full range of ecological benefits that a well-managed MPA provides (Bennett and Dearden, 2014). The Convention on Biological Diversity requires signatory parties to conserve at least 10% of coastal and marine areas of particular importance for biodiversity and ecosystem services through effectively managed systems of protected areas (CBD, 2010). Active management of MPAs, including regular monitoring and conservation of protected features and enforcement of measures that regulate or eliminate pressures and threats to those features, is considered an essential component of protected area management effectiveness (Hockings et al., 2006). Thus, active management is more likely to result in the ecological (Edgar et al., 2014) and socioeconomic success of MPAs (Bennett and Dearden, 2014). The multi-themed nature of the 'protected area management effectiveness' concept (Hockings et al., 2006) makes it necessary to narrow it down for assessment using indicators such as 'management performance' or 'management effort' (Horigue et al., 2014). However, clear links between 'management

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effectiveness' and biodiversity conservation outcomes of MPAs (e.g. increase in the abundance of a protected species) are difficult to find (Bennett and Dearden, 2014; Horigue et al., 2014).

The English Channel is an ecologically sensitive marine area and one of the most heavily used marine areas globally (McClellan et al., 2014; Dauvin, 2012). Provided that diverse coastal and marine socioeconomic sectors can be affected by the designation of MPAs (Bennett and Dearden, 2014; Klein et al., 2008; Rodríguez-Rodríguez et al., 2015a), multiple-use MPAs that allow a diversity of uses of the marine environment are thought to create fewer conflicts between users with competing interests than highly restrictive no-take MPAs (Lester and Halpern, 2008; Sciberras et al., 2013a). Thus, the strategy of the UK and French governments follows an ecosystem approach (CBD, 2004) to the conservation of the marine environment which tries to reconcile nature conservation and socioeconomic development through the designation of multiple-use MPAs (Rodríguez-Rodríguez et al., 2015a). However, the ecological effectiveness of multiple-use MPAs remains contentious, with some studies presenting positive effects of these MPAs over fished areas (Halpern, 2003; Lester and Halpern, 2008; Sciberras et al., 2013a) and other studies showing that multiple-use MPAs or MPA zones are not ecologically discernible from fished areas (Denny and Babcock, 2004; Guidetti et al., 2014; Rife et al., 2013). The high degree of marine and coastal anthropogenic pressure in the English Channel suggests that MPA protection through active management may play an even more important role in the effective conservation of features within multiple-use MPAs in this area (Dauvin, 2012; Rodríguez-Rodríguez et al., 2015b).

In this study, a structured questionnaire was circulated among MPA managers in the English Channel area to assess the influence of management effort on the conservation status of multiple-use MPAs. The objectives of this study were to: (1) describe the management effort in the set of multiple-use MPAs in the English Channel; (2) assess the relationship between management effort and biodiversity conservation outcomes of MPAs to explore whether different sub-levels of protection can affect ecological performance of multiple-use MPAs; and (3) analyse the degree of consistency in the management effort ratings of the same MPAs reported by different management bodies.

2. Methods

2.1. Study area

This study was carried out in the framework of the INTERREG IV-A project 'Protected Area Networks Across the Channel Ecosystem' (PANACHE, 2014). The project area matches the boundary of the OSPAR Marine Region III to the west and was extended to the north-east to fully encompass the French Exclusive Economic Zone (Fig. 1). The study area covers an area of 86 139 km^2 and includes 224 MPAs belonging to 12 designation categories (Fig. 2) of which 185 were included in this analysis (Appendix A) after excluding English MPAs without specific management at

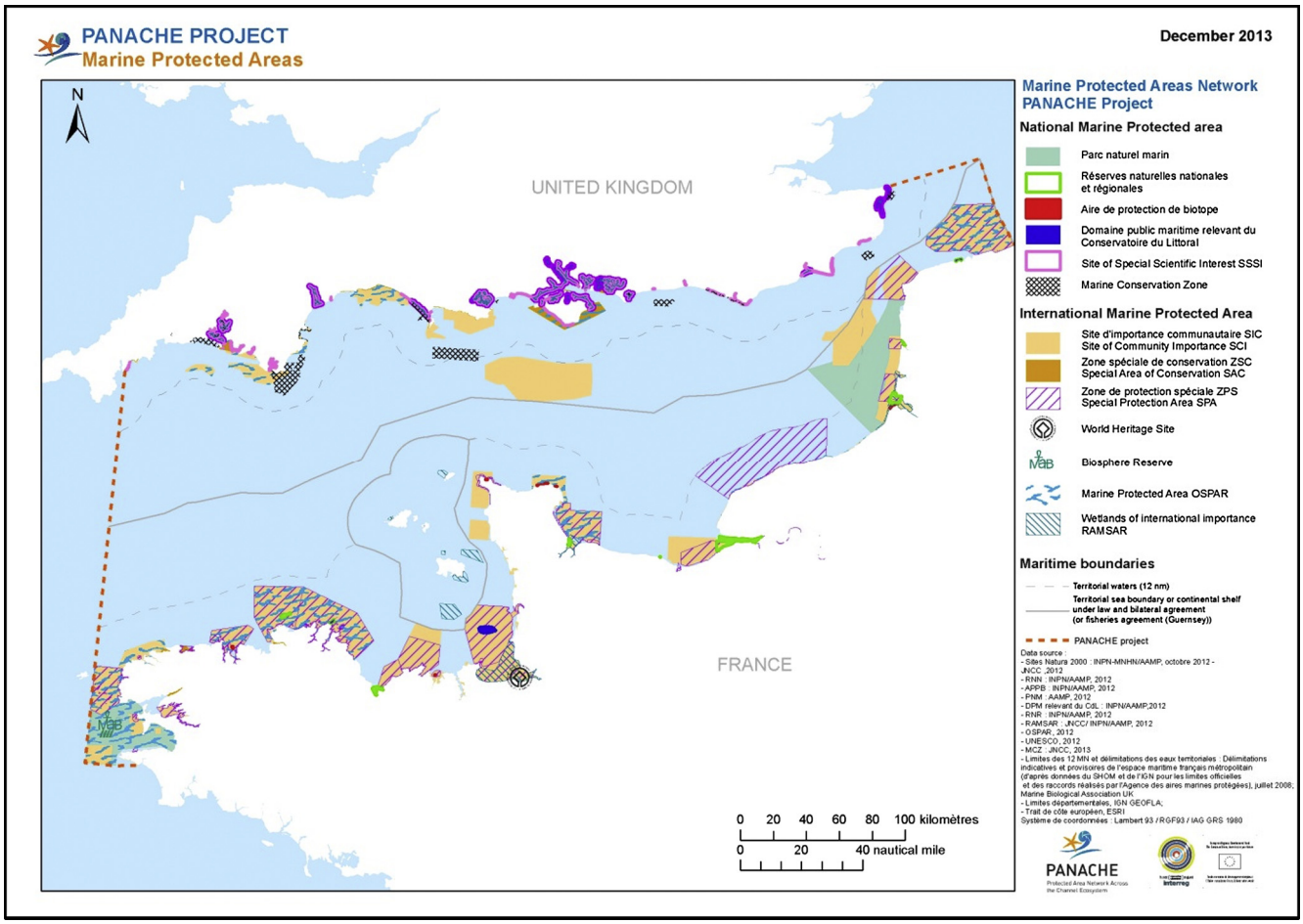

Fig. 1. PANACHE project area including boundaries and the different marine protected area designation categories.