



Social impacts of a temperate fisheries closure: understanding stakeholders' views



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ABSTRACT

The social dimensions of marine protected areas (MPAs) play an important role in MPA success, yet these social dimensions are little understood. We explore the social impacts arising from the establishment of an MPA using Lyme Bay (south west England) as a case study. Through a series of small group semi-structured interviews the social impacts experienced by fishermen (mobile and static gear), recreational users (divers and sea anglers) and recreation service providers (charter boat and dive businesses) were explored. The social impacts expressed varied according to activity in which the stakeholder group engaged. Negative themes included lengthening fishing trips, tension and conflict, fishermen identity, equity and uncertainty in the long-term. Positive themes included improved experiences for both commercial fishermen and recreational users, and expectations for long-term benefits. These impacts need to be understood because they influence stakeholder behaviour. Failure to interpret stakeholder responses may lead to poor decision-making and worsening stakeholder relations. These findings have implications for the success of the MPA in Lyme Bay, but also for the future network of marine conservation zones around the UK. Any assessment of MPA impacts must therefore identify social as well as economic and environmental change.

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1. Introduction

Marine protected areas (MPAs) are the result of social processes [1] or transactions, involving dynamic interactions between individuals and groups [2]. They also result from political and societal views on desirable states of the marine environment [3], reflecting social values that can be considered the set of rules that govern human behaviour. Furthermore, MPAs reallocate resources and property rights, and this may result in considerable social impacts for the affected stakeholders [1,4]. These impacts may be both positive and negative, resulting in social benefits (such as improved recreational experiences and greater appreciation of the marine environment [5]), which ultimately increase individual and societal welfare, but also social costs (such as displaced effort, longer time at sea and greater conflict between stakeholders [6]) that lead to a loss of individual and societal welfare. This social context (i.e. the environment in which these stakeholders interact, and the institutions with whom they interact), will influence the success

(development, management and performance) of an MPA and its perceived legitimacy by stakeholder groups [1,7]. The social context therefore influences the level of compliance by stakeholders to MPA restrictions.

The United Kingdom (UK) is in the process of developing a network of MPAs (locally known as marine conservation zones (MCZs)) for all English and Welsh waters, with Scottish and Northern Irish waters to follow. These MCZs aim to protect marine species and habitats of national and international interest, and will be located both inshore and offshore. This rapid increase in protection of UK waters will inevitably lead to the reallocation of property rights amongst interested stakeholders. What the impact of this reallocation of rights has on the welfare of stakeholder groups that have traditionally used the area is of interest to both managers and scientists. This is because win–win situations are rarely achieved where conservation objectives are met while at the same time satisfying stakeholder objectives [8]. Ultimately, trade-offs need to be made between the protection of the marine environment and human activities.

In this paper, a case study in south west England is used to explore the social impacts of establishing an MPA and to assess how rights have changed amongst the different stakeholders after the closure. In 2008, the UK Government's Department for Environment,

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Food and Rural Affairs (Defra) closed a 206 km² area within Lyme Bay through a Statutory Instrument (SI): The Lyme Bay Designated Area (Fishing Restrictions) Order 2008. The Statutory Instrument prohibits dredging for shellfish and demersal trawling within the designated area. It was brought into force following concerns about the impact that towed benthic fishing gear has on marine habitats, especially mudstone reefs, as the designated area is home to a number of nationally and internationally important marine species (e.g. ross coral (*Pentapora fascialis*), dead man's fingers, (*Alcyonium digitatum*), erect branching sponges, pink sea fans, (*Eunicella verrucosa*) and the sunset cup coral (*Leptopsammia pruvoti*)) and is considered a marine biodiversity hotspot [9].

The establishment of the closure in Lyme Bay was contentious due to the conflicting interests of different stakeholder groups and because of the process that led to the implementation of the Statutory Instrument [10,11]. The focus of the conflict has been on the reef areas after concern about their state was raised in the early 1990s by static gear fishermen and local divers [11]. This led to a campaign by the local NGO, Devon Wildlife Trust (DWT), and Natural England (then English Nature) for greater protection for the reefs. In 2001 environmental campaigners and local fishermen agreed to the voluntary closure of two reef areas (totalling 10.3 km²) in which mobile gear was excluded, and the closures were regulated by the local community. By 2005, however, scallop fishing had become a more lucrative business and Lyme Bay saw an increase in the number of scallop boats using the bay. This tested the voluntary agreements and in 2006, DWT received reports of infringements within the closed areas [10]. The outcome was a breakdown of the agreements and Natural England applied for a Ministerial Stop Order to close 206 km² to dredging and allow recovery of the seabed [11]. A new voluntary agreement was reached later in 2006 between the Secretary of State, the South West Inshore Scallopers Association and selected advisors for the closure of 41.2 km² of reef in four sections, but this was contested by DWT and Natural England. Consequently Defra initiated a public consultation process, seeking opinions on the options to close 41.2 km², 85.7 km² and 206 km². The fishing industry supported the closure of the originally agreed 41.2 km², but the majority of support, including many responses from the public (who had previously not been involved with the decision-making process), was for 206 km². The result of this consultation processes was Defra's decision to statutorily close the full 206 km². This left many from the fishing industry feeling disenfranchised and that their opinions had been ignored in favour of those with very limited understanding of the marine environment (i.e. the public) [10].

Early evidence indicates that the closure has had limited economic impact on the fishing community and the associated processing industry [12], but little is known about the social impacts resulting from the closure and the process that led to it. This study forms part of a larger Defra funded impact assessment and aims to explore any social impacts arising, drawing on interviews conducted with members of the mobile and static gear fishing community, and the recreational community (divers, sea anglers, charter boat operators and dive businesses). It therefore complements the study of Mangi et al. [12] and contributes to the evidence regarding the impacts of temperate MPAs, which should inform the establishment of the UK's MCZ network.

2. What are the social impacts of MPAs?

There is an enormous body of literature on MPAs, but much of this focuses on the generalised potential impacts of MPAs [13]; the expectations of MPAs [14]; bioeconomic models of potential spillover effects and its implications for fish catch and income [15]; monitoring and assessment of MPAs [16]; stakeholder opinions

about MPA management [17,18]; and descriptions of the governance options for MPAs [19]. Of the papers that do examine the implications for stakeholders of MPA designation, the majority of them draw upon case studies from tropical and developing country locations. Mascia et al. [20] in their review of impacts of MPAs on fishing communities only located 21 relevant studies of which 71% were in tropical and 73% in developing countries. Given their distinct governance mechanisms, the degree of dependence on marine resources by stakeholders for their livelihoods and the additional dimension of poverty, the lessons learnt from these case studies may not be transferrable to the experiences in the UK and other temperate areas.

Examples of studies from temperate MPAs are few and patchy in their coverage of stakeholder impacts. They typically cover impacts on just one stakeholder group, such as fishers [21,22] or recreational divers [23], although a small number cover multiple stakeholders [24]. Furthermore, as each MPA has been designed with its own specific objectives (e.g. fisheries management, or biodiversity conservation) and with different restrictions, generalising across these studies is difficult. These studies also tend to focus on economic impacts, such as changes in tourism expenditure [25]; fishing effort, catch and income [26,27]; and fleet movement and displacement effects [22]. Those focusing on social impacts, such as conflicts and changing relationships between stakeholder groups are few, although isolated cases do exist [27].

The wider MPA literature, and that relating to other fisheries management approaches (e.g. temporary and seasonal closures), suggests that a number of additional factors should be explored when examining the social impacts of MPAs. Mascia [1], and Mascia and Claus [28] state that the reallocation of rights is likely to affect a number of factors including the governance of the area, the economic well-being of the stakeholders, health, education, social capital (i.e. the information, trust and norms embedded in social relations and networks [29]) and culture of resource users, as well as local communities and other social groups. Those who gain rights are likely to benefit, while those who lose rights may face additional costs. The distribution of these costs and benefits need exploring as the benefits are likely to be diffuse, accruing to multiple stakeholders over extended periods of time, while the costs are likely to be immediate and concentrated on those who have lost access and withdrawal rights [30,31]. Those who lose the right to fish often suffer feelings of disempowerment and marginalisation [32], with changes evident in the community identity of those who are marginalised [33,34].

The reactions of stakeholders to the designations of MPAs will also be affected by the extent to which they consider decisions about MPAs to be equitable and just [32]. Recognising this, and the social dimensions described above, is important because it helps in the understanding of conflicts that accompany MPA implementation [35,36] and in the identification of opportunities for overcoming and managing problems.

3. Research methods

3.1. Lyme Bay case study site

Lyme Bay supports a fishing industry that comprises both static and mobile gear fishermen, targeting scallops and other demersal fish, as well as crabs, lobsters, whelks and pelagic fish. Prior to the closure, approximately 25 over 10 m trawlers and scallop dredgers, 25 under 10 m trawlers and scallop dredgers and 90 boats involved in netting, potting and whelking fished the now closed area [37]. Stevens et al. [38] demonstrated that the potting fishery was more valuable than the scallop fishery in the bay as a whole; but within the now closed area, scallops were marginally more

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