



## Analysis

# An analysis and valuation of post-designation management aimed at maximising recreational benefits in coastal Marine Protected Areas



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## ABSTRACT

Two waves of choice experiment surveys were carried out to capture preferences on recreational attributes of a coastal Marine Protected Area in England. A significant effect on preferences after a management intervention targeting recreation was observed. A mixed logit model with status quo as a random parameter showed that in 2014, the status quo had a negative effect, suggesting visitors were not satisfied by the status quo. However by 2015, after investments on a nature reserve, the status quo variable is highly significant and positive. The average benefits, measured in willingness to pay, generated by a refurbished visitor centre and other improvements is equal to £9.18 per visit per person. The study also found that key management attributes for future MPAs that will generate increased economic benefits from recreational activity are those that promote the diversity of wildlife and the provision of educational information. As expected the donation and the restriction attributes decrease the benefits, but on average their effects are smaller than wildlife improvements. From a policy and management perspective, especially in the context of public funding pressures, these results are particularly important as they provide evidence on management strategies that support conservation objectives and maximise economic benefits.

## 1. Introduction

In the EU, several Marine Protected Areas (MPAs) have been designated under different national and European legislation. For example, in England, Marine Conservation Zones are designated under the Marine and Coastal Access Act 2009 for England and Wales (UK Parliament, 2009), while Special Protection Areas and Special Areas of Conservation are designated under the EU Birds (79/409/EEC) and Habitats (92/43/EEC) Directives respectively. The main objective of designating these areas is to conserve and protect unique features, species and habitats to ensure the sustainable use of marine resources. Around the world, there is a growing literature on the potential and observed socio-economic benefits that MPAs provide (Boyle, 2011; Chae et al., 2012; Sanchirico et al., 2002; Stobart et al., 2009).

Socio-economic interests cannot be used to override the decision to designate Special Protection Areas and Special Areas of Conservation that fall under the European Birds and Habitats Directives (European Commission, 2006). On the other hand, legislation on Marine Conservation Zones in England allows social and economic impacts to be taken into account in Ministerial decisions regarding site designation (Marine and Coastal Access Act 2009, s117(7)). Regardless of the

legislation with which these protected areas are designated, projected or realised benefits must at least balance out the costs of designation and management, including costs to other activities that may be displaced or lost. This is crucial in getting, maintaining or increasing public support for these areas (Charles and Wilson, 2008). Cost-benefit analyses and Impact Assessments have been used to examine the potential positive and negative impacts of designating and managing MPAs. For example in the UK, the consultation for the designation of the First and Second Tranches of Marine Conservation Zones in England involved extensive Regulatory Impact Assessments in order to identify, and where possible monetise, the economic impacts of the designation (Defra, 2015, 2012). Economic assessments and evaluation of Marine Protected Areas in the UK tend to identify potential benefits if the area is designated (e.g. Börger et al., 2014; Hussain et al., 2010; Jobstvogt et al., 2014). Evidence on post-designation impacts are rarely investigated and as far as the authors are aware, studies on the economic benefits of management actions for MPAs are not common. However, information about the post-designation economic benefits from MPA management is crucial to help identify future actions that support and enhance benefits from an MPA. The present study aims to address this issue by examining visitor preferences on recreational activities given a

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Fig. 1. Flamborough Head, indicated by the star on the map.

change in MPA management which targeted recreation in the area. Results show that investments that add value to the recreational experience in a coastal MPA can generate economic benefits. A discrete choice experiment (CE) is employed to estimate Willingness to Pay (WTP) values for MPA attributes.

### 1.1. The Flamborough Head Marine Protected Area Case Study

Flamborough Head is on the North Sea coast of the county of East Yorkshire in England (Fig. 1). Within this area, two European Marine Site (EMS) designations exist: A Special Protection Area (SPA) under the European Birds Directive and a Special Area of Conservation (SAC) under the European Habitats Directive. The SPA was designated because the area supports large numbers of breeding seabirds such as the black legged kittiwake, the northern gannet, northern fulmar and the Atlantic puffin (JNCC, 2001). On the other hand, the SAC was designated for its vegetated sea cliffs, sea caves and chalk reefs (JNCC, 2015). Apart from these designations, it is also a Site of Special Scientific Interest under the UK's Wildlife and Countryside Act 1981. There are several nature reserves and historical buildings along the Flamborough Head coast which are popular with visitors and bird watchers especially during springtime due to the large and diverse population of seabirds that breed in the area. Additionally, Flamborough Head is very close to the seaside resorts of Bridlington and Scarborough which are

also popular with local visitors.

The 2016–2021 Flamborough Head European Marine Site Management Plan was recently published (Davison, 2016). The plan is the basis for the implementation of the Habitats the Birds Directives and to ensure that human activities (e.g. fishing, tourism/recreation, land management, sand/gravel extraction) are managed in ways that are compatible with the wildlife features of the EMS. It allows authorities involved to identify management actions that would ensure that protected features maintain or recover to 'favourable' condition.

In the study, the Flamborough Head EMS will be referred to as the Flamborough Head MPA, where MPA is a general term for protected areas in the marine environment regardless of the legislation under which the area is designated.

## 2. Methodology: Application of the Choice Experiment Method to Value Economic Benefits of MPAs

The theoretical basis of the Choice Experiment (CE) method is the Random Utility Model; where an individual makes discrete choices under a utility maximisation framework and that her choice over different alternatives is determined by attributes or characteristics of the good(s) within the alternatives (McFadden, 1973). These allow for the estimation of economic values for each specific attribute. Quantitative or qualitative improvements in the attribute indicate economic benefits,

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