

Recreational benefits from a marine protected area: A travel cost analysis of Lundy

Dong-Ryul Chae^a, Premachandra Wattage^{b,*}, Sean Pascoe^c

^a Gyeongnam Development Institute, 248 Youngji-ro, Changwon-si, Gyeongsangnam-do 641-728, South Korea

^b Centre for the Economics and Management of Aquatic Resources (CEMARE), University of Portsmouth, St. George's Building, 141 High Street, Portsmouth PO1 2HY, UK

^c CSIRO Marine and Atmospheric Research, Australia

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ABSTRACT

Marine Protected Areas (MPAs) have been proposed in many countries as a means of conserving parts of the marine environment. In some cases, MPAs may also confer recreational benefits. In this paper, a travel cost model is used to estimate the non-market recreational benefits arising from the Lundy Island Marine Nature Reserve (MNR). The estimated mean consumer surplus for visiting Lundy was found to range from £359 to £574 per trip. The designation of No Take Zone (NTZ) has also contributed to higher consumer surplus values. This result provides a strong economic justification for the designation of MPAs for recreational as well as conservation purposes.

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1. Introduction

Marine Protected Areas (MPAs) are specially designated zones of the sea that are designed to restore marine ecosystem to the original state by excluding all detrimental human activities. While often imposed for purely conservation purposes, MPAs can also result in economic benefits to users of the marine environment. Economic benefits of MPAs can be largely divided into two parts – fisheries and non-fisheries benefits. In the case of fisheries, many studies have demonstrated both theoretical and empirical benefits to fisheries from MPAs (Ami, Cartigny, & Rapaport, 2005; Dugan & Davis, 1993; Lewison, Crowder, Read, & Freeman, 2004; Sumaila, 1998; Zeller & Russ, 1998).

Studies concerning the non-fisheries benefits of MPAs have mainly dealt with nature based recreation and tourism within large-sized tropical coral reef areas such as the Great Barrier Reef Marine Park in Australia (Driml, 1997; Hill, Rosier, & Dyer, 1995; Rouphael & Inglis, 1997; Valentine, Birtles, Curnock, Arnold, & Dunstan, 2004) and the Florida Keys National Marine Sanctuary in the USA (Bhat, 2003; Leeworthy, Wiley, English, & Kriesel, 2001; Park, Bowker, & Leeworthy, 2002).

This study aims to examine the potential benefits of marine nature based tourism in the UK arising from the designation of a MPA. This information will be useful for policy makers when planning the designation of future MPAs in line with international

commitments to protect the marine environment (e.g. under the UNEP Convention on Biological Diversity of 1993 and the World Summit for Sustainable Development of 2002). The study focuses on recreational demand in the Lundy Island marine nature reserve (MNR). This contains the first no take zone in the UK water. A travel cost model was estimated using count data regression techniques in order to measure the non-market recreational benefits of the Lundy MNR.

2. Lundy Island MNR

2.1. Background

Lundy is an island three miles long by half a mile wide, standing four hundred feet out of the sea, situated in the Bristol Channel (UK – Lat: 51° 10' N; Long: 4° 40' W) (See Fig. 1). Currently, the Island is owned by the National Trust and is financed, administered and maintained by The Landmark Trust. There are about 20 permanent residents working on the island, and 23 buildings that can be rented by holiday visitors.

Lundy has been inhabited since prehistoric times. Nomadic hunters and fishermen were the earliest people to live on Lundy. Archaeologists presume Lundy was a summer fishing base during the later Mesolithic Period (The National Trust, 2002). Since medieval times, it has been managed by private ownership and the tenants made their living by agricultural, stock farming, fisheries activities amidst other forms of livelihood (Langham, 1994). The last joint owners sold Lundy to the National Trust on 1 October 1969 for £150,000 and the National Trust leased Lundy to the Landmark

* Corresponding author. Tel.: +44 23 9284 8508; fax: +44 23 9284 8502.

E-mail address: p.wattage@port.ac.uk (P. Wattage).

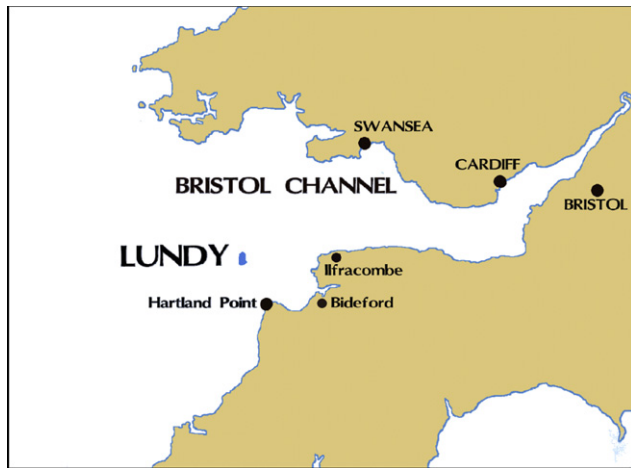


Fig. 1. Lundy Island location.

Trust for a period of sixty years. Thereafter, the Landmark Trust has expanded and improved facilities around the island including electricity and water supply, visitor accommodation and restoration of old buildings. The main transportation to Lundy is a shuttle ferry – the MS Oldenburg – with a capacity of 267 passengers and 20 tons of freight. Annual passenger numbers on the MS Oldenburg were approximately 17,000 in 2005. Other visitors to the island can use charter boats based at the local harbour of Clovelly and Appledore. However, with the operation of full winter helicopter service since 2003, visitor numbers have increased recently (Friends of Lundy, 2004).

By the end of the 20th century, the island was designated into several types of special or protected areas, reflecting different environmental and other assets of this area. It was originally established as a Voluntary Marine Nature Reserve (VMNR) in 1973 by the local naturalist society (Jones, 1999). In 1986, Lundy Island and the sea area around Lundy were designated as the UK's first statutory Marine Nature Reserve (MNR). Recently, it was designated as a Marine special area of conservation (MSAC) under the European Union's Habitats Directive legislation as part of the Natura 2000 Network. On January 2003, the east side of Lundy MNR was designated as the first no take zone (NTZ) in the UK jointly proposed by the Devon Sea Fisheries Committee and English Nature to alleviate pressure on fish and shellfish stocks and to restore wildlife.

2.2. Recreational activities on Lundy Island

Visitors are attracted by the outstanding natural conditions of Lundy, well protected ecological environment, and historical remains scattered on the island. Lundy provides opportunities for various recreational activities from simple relaxation to expert leisure activities that demand special equipment and skills.

The underwater natural environment around Lundy affords optimum conditions for both recreational and research purpose divers. First of all, the seawater around Lundy Island is pristine, because of the distance from sources of pollution on the mainland. Secondly, Lundy is well-known for its plentiful and varied marine flora and fauna due to the geological and topographical features. The ocean area around Lundy is a transitional zone where the Gulf Stream mixes with cooler north Atlantic water, and so is a suitable habitat for both cold water and warm water organisms. The seabed around Lundy contains a multiplicity of habitats including rocky

reef, kelp forest, sandy and muddy bed. In addition, the shipwreck sites around Lundy are also an important attraction for divers.

Wildlife watching is also a popular tourist activity. Visitors can see jellyfish, grey seal and turtles with the naked eye from several places and in the summer months, dolphins, porpoises and basking sharks as well. The island is also famous for a variety of its birdlife, especially the Puffin; the name Lundy is Norse for Puffin Island (Langham, 1994). The results of research by the Lundy Field Society demonstrate that the natural condition of Lundy is good for birds; 1) the cliffs around Lundy provide summer breeding sites for several seabirds; guillemots, storm petrels, puffins and Manx shearwaters and 2) the plateau provides breeding sites for curlew, lapwing, meadow pipit, skylark and wheatear while oystercatchers breed along the coastal fringes.

Lundy is well-known as a special place for cliff climbers and walkers. According to the Lundy information map, there are 29 climbing routes varying from gentle slabs to steep cracks and the west coast cliffs named Devil's Slope are particularly good for climbing. There are two suggested walking routes on Lundy, although many tourists prefer to wander around the island.

The island also contains many historical sites of interest to tourists. The archaeological remains distributed around the island provide another large component of the recreational activities on Lundy. Various prehistoric remains including hut circles, walls and associated field boundaries are scattered around the island. A 13th century castle, known as Marisco Castle, standing at the southern end of the island is a representative ruin of medieval times. A total of three lighthouses constructed on Lundy, the Old Light and two new lights (North and South Light) are significant within the context of ocean history. The Old Light, the highest lighthouse in Britain, was built in 1820, but replaced in 1897 by two new lights close to sea level at the north and south ends. The two lights were converted to solar power in 1991 and are still in operation.

3. Study design

This study employs the travel cost method to model the recreational demand of Lundy Island and to calculate the non-market benefits gained by Lundy visitors. The travel cost method is a revealed preference approach that is based on the premise that visitors must have been willing to pay at least what they did pay in order to visit the island, so the benefits of the visit must have at least exceeded this amount. The demand for the recreation can be estimated by comparing the number of visits by individuals from different locations with varying travel costs.

3.1. Data collection

The data used in the study were obtained from an on-site survey of recreational visitors on Lundy Island. Face-to-face interviews were conducted during the period of July–August 2005, mostly onboard MS Oldenburg and sometimes on the island itself. A total of 161 survey questionnaires were collected, but not all of these were usable for the travel cost analysis due to several reasons. The most common reason for the non-usability of responses was non-response for some key questions involving household's income level. As participation in the survey was voluntary, interviewers could not ensure that all questions would be answered household income levels. From the 161 completed surveys, 86 responses were included in the final econometric analysis. Information collected from the remainder of the interviews was still usable for other parts of the study (not presented in this paper).

The questionnaire consisted of four parts, with a total of 44 questions. These were a mixture of yes/no, multiple choice, and open-ended questions. The first part of the questionnaire was

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