



Assessing harbour porpoise populations in south-west Wales, data issues and implications for conservation and management



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ABSTRACT

The UK Government was recently criticised for failing to fulfil its obligations under the Habitats Directive in respect of designating protected areas for Harbour Porpoise *Phocoena phocoena*. At the centre of the discussion lay the stringent nature of the qualifying criteria for site selection. Concurrently, there is a growing support for marine renewable energy technologies; however the planning process is often hampered by inadequate marine data to enable appropriate siting or mitigation against potential ecological impacts. The Bristol Channel region's physical environment is a suitable source for the generation of marine renewable energy, and the world's first tidal lagoon will be sited in Swansea Bay. A 10 year dataset was collected, analysed and compared against the qualifying criteria for a Special Area of Conservation (SAC). Results revealed that a resident population of porpoise existed and density values of 0.58 hp km² were comparable with other UK regions. While an insignificant calf adult ratio of 1:13 was recorded, breeding and nursery areas were identified. Analysis highlighted a number of hotspots of porpoise activity, suggesting that these areas are critical habitats, particularly for feeding and foraging. Such information will enable future marine renewable energy developers to select the most appropriate sites. It is argued that existing SAC qualifying criteria prevents recognition of critical habitats for the harbour porpoise and a case is made for an eastward extension of a proposed harbour SAC to include Swansea Bay and the south Gower coast. This paper demonstrates that cetacean data is sparse and even though this study has filled important knowledge gaps, there is still a need for further research. This research would enable both developers and planners to adequately and appropriately consider future marine renewable energy projects.

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1. Introduction

Harbour porpoise *Phocoena phocoena* are protected under the Habitats and Species Directive (92/43/EEC) and listed as a priority species in UK Biodiversity Action Plans (UKBAP; Jenkins, 2007). They are the smallest marine mammal found in UK waters and even though they occur offshore, are more typically sighted in coastal areas (Jenkins, 2007). Often associated with near-shore headlands and strong tidal currents, porpoise are commonly observed within shallow bays, estuaries and narrow tidal channels (Pierpoint, 2008; Baines and Earl, 1999). Their small size, shy nature, lack of clearly

identifiable markings and highly mobile, wide ranging nature make harbour porpoise difficult to observe. These characteristics make data collection challenging, which in turn has contributed to a lack of protected areas being identified in the UK (Embling et al., 2009).

Dolman et al. (2013) identified 10 sites where sufficient evidence existed to undertake protective measures. In Wales, these sites included north Pembrokeshire, south Cardigan Bay, Lleyn Peninsula, Bardsey Island, and north and west Anglesey. However, there has been criticism that policy makers provide frameworks designed to support and conserve species, but make qualifying criteria too restrictive or inadequately defined, creating loopholes and inconsistencies (Pinn, 2010).

To ascertain whether harbour porpoise, currently a species of conservation priority, is at Favourable Conservation Status, it is necessary to monitor annual trends in numbers and distribution over a sufficient time scale, in order to test statistical significance. However, research data is limited, particularly in South Wales, and

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as a consequence, this has proved a barrier for harbour porpoise protection. This has been highlighted by the European Commission, who announced infringement action against the UK Government for failing to adequately fulfil its duty of care (July 2013). In October 2014 the UK Government was given two months to develop a porpoise protection programme or face penalties, for failing to comply with the Directive (Neslen, 2014).

Concurrently, there is increasing interest in marine renewable energy (wave, wind and tidal stream technologies) that is supported by the UK Government. However, developers and planners are often disadvantaged by a lack of accessible scientific data in order to make siting decisions. Strong baseline data is essential for compliance with legislation, planning processes and to provide an Environmental Impact Assessment (Environment Agency, 2002). Therefore, determination of potential conflict between marine mammals and marine renewable energy devices is fundamental to the industry's development in UK waters. Recent coastal and marine research has focused mainly on ecosystem management (Liquete et al., 2013) and building in resilience as a buffer against environmental and anthropogenic impacts (Brown et al., 2014) but worldwide research detailing harbour porpoise distribution is extremely sparse.

Therefore, this paper assesses harbour porpoise population distribution, both within Swansea Bay and the wider Gower coastal waters, filling an important research gap by bringing together an extensive dataset collected by multiple organisations. This represents one of the UK's largest datasets for cetaceans and enabled further understanding of regional porpoise distribution, highlighting the need for protection of its critical habitats. Results will inform both government and potential marine renewable energy developers.

1.1. Legislative overview

The harbour porpoise is legally protected under the EU Habitats Directive (92/43/EEC; EU, 1992). Under the Directive, all cetaceans are listed for protection and as such, governments have a duty to designate Special Areas of Conservation (SACs) to enable their survival (Evans and Prior, 2012). Harbour porpoise are also listed in the OSPAR Convention for the Protection of the Marine Environment of the North-east Atlantic as threatened and declining (OSPAR, 2008) and having unfavourable conservation status in Appendix II of the Convention on the Conservation of Migratory Species of Wild Animals (CMS, 2015). Yet while *P. phocoena* is not under immediate threat of global extinction, there are a number of local impacts endangering both its distribution and abundance (Dolman et al., 2013). The EU Marine Strategy Framework Directive requires Member States to attain a Good Environmental Status (GES), using an ecosystem approach (EU, 2008) and the Natura 2000 network by implying that it is an essential tool for the attainment of GES (Dolman et al., 2013). Some of the highest concentrations of harbour porpoise are found in UK waters (Booth et al., 2012) and it is imperative that the UK designates some Natura 2000 sites as Marine Protected Areas (MPAs) in order that the network be representative. Where critical habitat (e.g. feeding and breeding areas) can be identified, then an MPA would provide some additional protection (Pinn, 2010).

The Marine and Coastal Access Act (2009) gave Welsh Ministers powers to designate a new genre of MPAs known as Marine Conservation Zones (MCZs; JNCC, 2014). MCZs provide protection to nationally important marine features that are not covered by existing designations, making the MPA network ecologically coherent. There is only one MCZ in Welsh waters around Skomer Island, Pembrokeshire (UK Grid reference 1726600,208900) and a further 10 sites that were consulted upon in 2012 but withdrawn in

July 2013 (Davies, 2013). In order to comply with the Marine Strategy Framework Directive (MSFD) and the requirements of MaCAA (2009), the Welsh Government is obliged to contribute to a coherent and well-managed network of MPAs by 2016.

In response to difficulties experienced in identifying SACs for mobile marine species, an *ad hoc* working group of the EC Habitats Committee developed additional indicators in December 2000 (EC, 2001). These were published in the European Commission's marine guidelines (2007) creating a guiding principle designed to assist Member States in the identification of areas 'representing the physical and biological factors essential to their life and reproduction' (Aish and Johnson, 2009). These Additional Indicators are centred on four variables namely:

- (1) Continuous or regular presence
- (2) Good population density in relation to neighbouring areas
- (3) High ratio of young to adult group members
- (4) Other biological elements which are characteristic

It was anticipated that a coherent network of sites (Natura 2000) would span territorial waters of EU Member States by 2012 (EU, 2007). However, only Skerries and Causeway in Northern Ireland have been designated as a Grade C SAC (i.e. 5–9 months continuous presence) for harbour porpoise, recognised as a *Feature* but not a primary reason for SAC site selection (NIEA, 2010). Thirty three other identified sites were all graded 'D' (where populations were considered either too low or transient in nature and that no porpoise-specific management need be considered (Dolman et al., 2013). Many conservation groups and scientists believe that designation criteria are too stringent and not fit for purpose in the case of harbour porpoise (Green et al., 2012; Luk and Gregerson, 2013) and SAC designation processes have been criticised by a number of researchers (see for example, Dolman et al., 2013; Evans and Prior, 2012; Green et al., 2012; Clark et al., 2010). Work is currently being undertaken to analyse the most up-to-date and extensive porpoise datasets, to determine whether any further areas are suitable for designation within UK waters (Defra, 2015). The Swansea Bay and outer Bristol Channel region has been assessed based upon key criteria, in order to demonstrate that even if not specifically designated as a SAC for harbour porpoise, the habitat is critical for local populations seasonally.

1.2. Background to the study

The UK Government aimed to increase electricity produced from renewable sources to 15% by 2015 and coastal regions of South Wales are ideally located for the emergence of renewable energy technologies (DECC, 2013). Given the potential for conflict between marine renewable energy devices and marine mammals (Wilson et al., 2007), fine-scale surveys were needed to assess both distribution and habitat use of target species (Shucksmith et al., 2009). Swansea Bay has become the focus of a proposed tidal lagoon project, which was recently granted planning consent by the Secretary of State for Energy and Climate Change. The initial Environmental Impact Assessment (EIA) Scoping Report highlighted limited access to long-term monitoring data, a common problem facing many ecological consultancies (TLSB Ltd, 2012). Providing a clearer picture of habitat usage of marine mammals in coastal waters became essential not only for the proposed lagoon, but for future marine spatial planning. The European Regional Development Fund enabled the formation of the Low Carbon Research Institute (LCRI) a multidisciplinary collaboration of leading academic marine institutions in Wales, whose research projects inform, support and contribute to the marine energy sector. Under the project, porpoise distribution and abundance data was

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