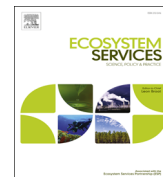




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Ecosystem services assessment at Steart Peninsula, Somerset, UK

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ABSTRACT

A systemic valuation was undertaken of marginal changes in ecosystem services assessed as likely to result from the Steart Coastal Management project, some in monetary terms and others semi-quantified. The Steart Coastal Management project entails allowing seawater once again to inundate formerly defended farmland, including modifications to the landform of to assist the re-creation of a range of wetland habitats on the Steart Peninsula. Primary drivers for this project include habitat creation and management of coastal flooding, although implications for a range of other connected services need also to be taken into account. Ecosystem services for which a market exists (typically traded goods with associated use values) were valued using market prices. For non-traded services, this study relied substantially on the economic valuation technique of 'value transfer'. Despite having to rely on some wide but transparently stated assumptions and uncertainties, a conservative, yet considerable, net annual benefit range of £491,155 to £913,752 was deduced. Research gaps that limited our ability to quantify and/or value several ecosystem services were identified.

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1. Introduction

Ecosystems, comprising both abiotic elements and biodiversity, provide a wide range of services supporting human wellbeing, including economic activities. However, exploitation of the services provided to society by ecosystems has tended to focus on provisioning services for which market values have become established (food, fibre, water yield, etc.), disregarding most other services in conventional economic analyses and decision-making contributing to their progressive degradation (Millennium Ecosystem Assessment, 2005; UK National Ecosystem Assessment, 2011; Russi et al., 2013). Management regimes favouring a wider set of socially desirable services does take place, particularly on land in public ownership such as National Parks as well as at various types of nature reserve and floodwater attenuation sites and on private holdings where land use is shaped significantly by subsidies addressing wildlife and landscape considerations or where management favours a recreational, amenity or other uses. However, commercial drivers still tend to favour ecosystem exploitation focussed substantially upon marketable outputs as a generality, with wider beneficial services a net unintended casualty. Recognition of these currently externalised values in

corporate and governance decision-making is essential to halt or reverse ecosystem degradation and the systematic undermining of human wellbeing, also helping identify opportunities where multiple benefits can be realised. It is certainly consistent with commitments to taking an Ecosystem Approach at international scale (Millennium Ecosystem Assessment, 2005) and in stated government intent in the UK (HM Government, 2011).

Recognising, and where possible quantifying in monetary or other terms, the value of all interconnected services promotes incorporation of the diverse values provided of ecosystems into the mainstream of planning and other decision-making processes. If services are omitted from consideration, there is a significant risk that they may be underrepresented or completely disregarded in decision-making processes (Everard and Waters, 2013). 'Mainstreaming' the value of the natural environment not only contributes to more robust decision-making, but may help diversify and integrate funding streams directed at nature conservation, flood risk management and other purposes, contribute to job and wealth creation, and ensure a more equitable sharing of the benefits provided by nature (HM Government, 2011).

1.1. The Steart Coastal Management Project

The Steart Coastal Management Project (SCMP) comprises re-profiling and allowing the controlled inundation of a formerly defended farming landscape in order to re-create a range of

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wetland habitats, including extensive intertidal habitat following the managed breaching of existing man-made defences on the Steart Peninsula. Initiated by the Environment Agency (EA), this project addresses predicted sea level rise and is driven primarily by the requirements of the EU Habitats Directive. Recreated wetland habitat augments designated habitat of particular wildlife interest and offsets losses of intertidal habitat across the wider Severn Estuary due to rising sea levels as well as planned development and coastal flood defence schemes which, without compensatory habitat, would not be permitted. The project also contributes to the sustainable management of flood risk to people, property and public infrastructure on the Steart Peninsula by realigning the sea defences further inland, a process known as managed realignment (MR) (Environment Agency, 2011).

1.1.1. The study site: Steart Peninsula

The Steart Peninsula is located on the north Somerset coast at the confluence of the River Parrett with the Severn Estuary (Fig. 1-1).

Prior to managed realignment, land use on the Steart Peninsula predominantly comprised cultivated fields, improved grassland and permanent pasture, divided by a network of rhyne (freshwater ditches) which are either open or enclosed by species-poor hedgerows. The Peninsula is adjacent to internationally and nationally designated nature conservation areas forming part of the Severn Estuary Ramsar Site, Special Area of Conservation (SAC) and Special Protection Area (SPA), as well as Bridgwater Bay

National Nature Reserve (NNR) and Site of Special Scientific Interest (SSSI).

1.1.2. Description of the project

The SCMP involves recreating intertidal habitat by managed realignment of the existing coastal defences (Fig. 1-2, Area D), the creation of additional saline-influenced habitat through regulated tidal exchange in Area E, and freshwater habitat in Area B. Fig. 1-3 shows the Steart Peninsula prior to and following establishment of the planned new wetland features. This future management option has been assessed and adopted as the preferred one prior to this study. In this way, the present research only looks at this single project versus the present baseline.

1.2. Study aims and objectives

The study comprised an assessment of marginal changes to ecosystem services likely to arise through managed realignment at the Steart Peninsula. This was based on the Millennium Ecosystem Assessment (2005) classification of ecosystem services, seeking as far as possible to identify economic and non-monetary value of the SCMP. Study aims included:

- 1) Assessment of the environmental benefits/costs from habitat creation at Steart to provide evidence to guide optimal outcomes in related projects;

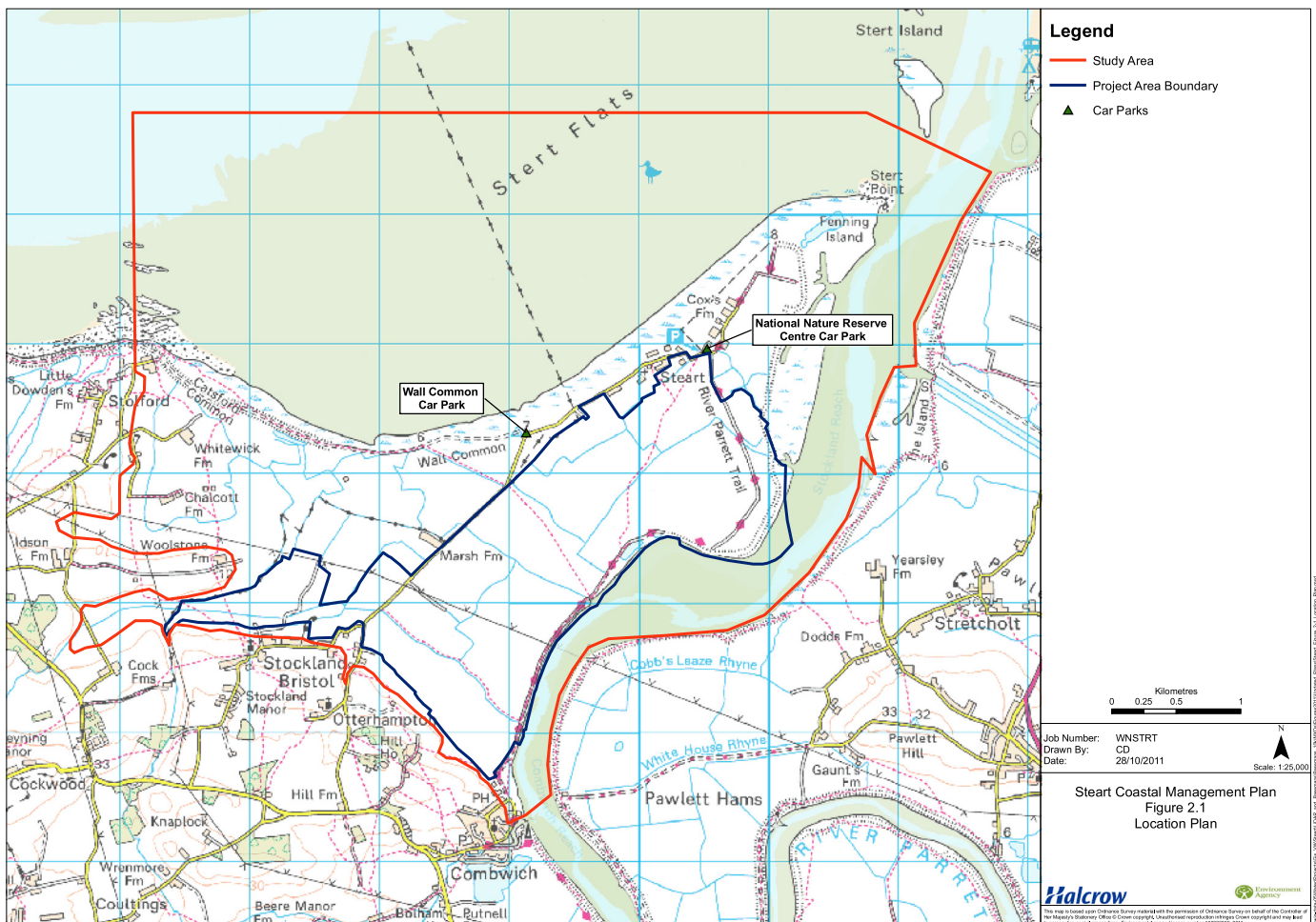


Fig. 1-1. Steart location plan (©CH2M Hill & Environment Agency).

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