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Regional marine spatial planning – The data collection and mapping process

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ABSTRACT

Marine spatial planning (MSP) is increasingly being recognised as an important tool in the sustainable management of marine ecosystems. In preparation for the development of MSP across Scotland, the Scottish Government, via Marine Scotland, first piloted regional marine planning in 2006, through the Scottish Sustainable Marine Environment Initiative (SSMEI). The overarching aim of SSMEI was to develop and test the effectiveness of differing management approaches to deliver sustainable development in Scotland's coastal and marine environment. The Shetland Islands' Marine Spatial Plan (SMSP) was first developed under the SSMEI programme, and in 2014 the Shetland Islands Council is intending to adopt the fourth edition of the SMSP on a statutory basis as Supplementary Guidance to its Local Development Plan. Using Geographic Information Systems (GISs) the SMSP has incorporated spatial data on existing marine and coastal environmental, socio-economic and cultural features and activities into the decision making process, and is an example of place based management. This has required collecting and collating 127 data sets from a range of data sources, and has utilised local stakeholders to verify evidence. This process has required significant resources by a dedicated marine spatial planning team, as well as by local stakeholders. The data within the SMSP has also been used to develop spatially-specific policies to guide the future development of Shetland's coastal and marine environment. It has been used by a range of users including developers and decision makers in planning and assessing areas for development, allowing potential conflicts to be avoided or mitigated early in the development process.

1. Introduction

Marine spatial planning (MSP) is increasingly being recognised as an important tool in the sustainable management of marine ecosystems [1]. Whilst several definitions exist for MSP, UNESCO defines it as 'a public process of analysing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives that usually have been specified through a political process' [2].

In the UK, a legal framework for the development of marine spatial plans has been initiated under the Marine and Coastal Access Act 2009, Marine (Scotland) Act 2010 and Marine Act (Northern Ireland) 2013. In Scotland, under the Marine (Scotland) Act, there is a provision for the development of both a national marine plan and regional marine plans. The Scottish Government consultation on Scotland's draft National Marine Plan was launched in 2013. The boundaries of the regional marine plan areas were also subject to consultation in 2013, and it is expected that the development of regional marine plans will begin in 2014. Within the UK the development of these plans will be influenced by a range of existing directives and policies, e.g. the EU Integrated Maritime Policy [3], Blue Growth [4], Water Framework Directive [5], Marine Strategy Framework Directive [6], and Habitats Directive [7]. In addition, the European Union (EU) has recently proposed a directive to establish a framework for Maritime Spatial Planning and Integrated Coastal Zone Management [8].

In preparation for the development of MSP across Scotland, the Scottish Government, via Marine Scotland, first piloted regional marine planning in 2006, through the Scottish Sustainable Marine

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Environment Initiative (SSMEI). Four pilot areas were selected: the Berwickshire coast, the Firth of Clyde, the Sound of Mull and the Shetland Islands. The overarching aim of SSMEI was to develop and test the effectiveness of differing management approaches to deliver sustainable development in Scotland's coastal and marine environment [9].

MSP exercises worldwide have highlighted that a critical component to efficacy within MSP is comprehensive ecological and social data to support the process [10]. Of the four SSMEI projects, the Shetland MSP pilot focused most strongly upon the collection of baseline spatial data, and was the only pilot to include the publication of a 'Marine Atlas'. Here the process of data collection in the Shetland Islands' regional marine plan is examined including the range of available data sources, the application of the spatial data, and the resources required to undertake the mapping process.

2. Methods

The Shetland Islands' Marine Spatial Plan (SMSP) was initiated as a pilot in 2006, and was led by a dedicated project team based at the NAFC Marine Centre. The development of the SMSP was guided by both a Local and a National Steering Group, comprising representatives from government agencies, local government, industry representatives, local community representatives and non-government organisations (NGOs).

The SMSP has been developed through a cyclical process; see Fig. 1. Mapping important environmental, socio-economic and cultural features and activities was undertaken in parallel to policy development, with both processes helping to highlight the ecosystem services delivered by the SMSP area. The seven key steps in the mapping process were as follows.

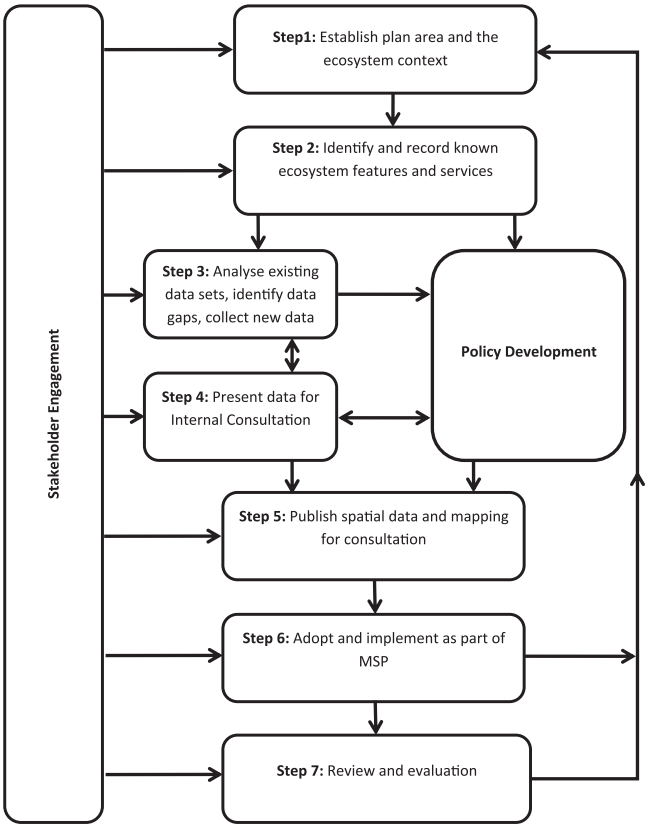

Fig. 1. Data collection and evaluation process within the Shetland Islands' Marine Spatial Plan.

- Step 1: Define the SMSP area including seaward and landward extents; define the scope and responsibilities of the SMSP.
- Step 2: Identify important marine and coastal biophysical features as well as ecosystem services relevant to the SMSP area and within a planning context.
- Step 3: Examine available data sources and identify data gaps. Prioritise new data collection, and convert data from multiple sources to a Geographical Information System (GIS) format to produce maps of features and activities.
- Step 4: Consultation with key stakeholders, including the establishment of local subgroups to scrutinise the national evidence base and create a local evidence base.
- Step 5: Formal public consultation.
- Step 6: Local Steering Group facilitates the implementation of the SMSP.
- Step 7: Review and evaluation.

During the SSMEI pilot three editions of the SMSP were published, with feedback from each consultation helping to refine the SMSP's development. The first edition of the SMSP was launched in 2007 and in 2008 the Local and National Steering Groups agreed that the second edition of the SMSP should be adopted on a voluntary basis. Consequently the SMSP was referenced in marine planning applications and licensing documents, such as Environmental Statements, consultation responses, appropriate assessments and marine consent notices.

In 2010 the SSMEI pilot ended; however the continued development of the SMSP was supported by Marine Scotland and the NAFC Marine Centre. This continued development of the SMSP was guided by a Local Advisory Group whose memberships included all members of the Local Steering Group and additional industry and NGO representation. In 2012 a full review of the SMSP was undertaken which included a number of assessment methodologies, including interviews with stakeholders and analysis of the use of the SMSP (see [11]). In 2013 the fourth edition of the SMSP was developed, guided by the Reviews findings. This fourth edition is due to form Supplementary Guidance to the Shetland Islands Council's Local Development Plan when it is formally adopted in Summer 2014.

2.1. Capturing local data

Local data and knowledge was captured in a Marine Atlas using a variety of methods: interviews, scrutinising official national datasets, assessing local data sets and establishing subgroups of the Steering Group (latterly the Advisory Group). The subgroups were used to get a collective opinion on the distribution of important features and decide on the most appropriate way of presenting the data, including testing of a zoning approach.

During the SMSP's initial development two data subgroups 'Biodiversity' and 'Spatial Analysis' identified what marine and coastal activities would fall within the SMSP's management responsibility (step 1) and what existing uses and features could be impacted by these activities e.g. user–user conflicts and user–environment conflicts (step 2); and what data sources were available for each feature or activity (step 3). These two subgroups assessed the data to determine its quality, what data gaps existed and guided new data collection. They also determined the following.

- What spatial and temporal data should be included for each feature or activity?
- How to present data, e.g. raw data versus aggregated data?
- What caveats should be applied?
- How data and mapping should be made available, e.g. paper format, in the GIS format?