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Developing an ecologically-coherent and well-managed Marine Protected Area network in the United Kingdom: 10 years of reflection from the Joint Nature Conservation Committee

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Our special seas and the UK’s commitment to conservation

From vibrant cold-water coral reefs to sedimentary habitats teeming with marine life, the UK’s marine environment is home to some of the most biologically diverse habitats and species in Europe (Figure 1). Marine Protected Areas (MPAs) are one of the tools that can help to protect our marine environment, whilst enabling sustainable use of our seas to continue.

Royal assent of the UK Marine & Coastal Access Act in 2009, and the respective UK administration-level Acts that followed (herein referred to as the ‘Marine Acts’), enshrined into domestic law a new era for marine conservation in the UK, thus enabling, amongst other activities, the establishment of MPA networks that conserve the range of marine life found in the UK waters. Prior to this, EU Directives such as the Habitats Directive enabled spatial protection measures to be established for specific habitats and species considered to be of European importance. The Marine Acts call for the establishment of national MPAs to complement the existing ‘building blocks’ of the UK MPA network such that in total they represent our contribution to international drivers to develop an ecologically-coherent and well-managed MPA network (Figure 2).

The UK administrations (Scotland, England, Wales and Northern Ireland) follow a number of key principles in their development of an MPA network, albeit delivered through a series of nationally-focussed projects. These principles were derived from OSPAR guidance (OSPAR, 2006):

- **Features**: the network should represent the range of habitats and species for which MPAs are considered appropriate – with a greater proportion of particularly threatened and/or declining features.
- **Representativity**: the network should include areas that best represent the range of habitats and species.
- **Connectivity**: the network should comprise MPAs that are well-distributed and take into account linkages between marine systems.
- **Resilience**: the network should include more than one example of a feature in individual MPAs and ensure they are of sufficient size to deliver conservation benefits.
- **Management**: the network should ensure the protection of marine habitats and species for which an MPA has been identified.

The role of the Joint Nature Conservation Committee

The Joint Nature Conservation Committee (JNCC) is the public body that advises the UK Government, Devolved Administrations, Overseas Territories and Crown Dependencies on UK-wide and international nature conservation matters. Specifically, our marine operational advice work focusses on the UK offshore marine area (beyond 12 nautical miles from the coast).

JNCC has been actively involved over the past 10 years in providing scientific advice to UK Governments on the selection and designation of MPAs in the UK offshore marine area, but also working closely with public bodies responsible for advising on MPAs in territorial waters.
under Aichi Target 11 of the Convention on Biological Diversity. Figure 3 provides an overview of MPA coverage within the UK marine area by biogeographic region. At JNCC, we are proud of the work we have achieved in supporting the designation of 56 MPAs in UK offshore waters, which at over 150,000 km² is a combined area larger than the size of England.

A snapshot of progress

The UK has designated 584 MPAs covering 23% of the UK marine area, over two times the area requirement noted (within 12 nautical miles of the coast) across all UK administrations.

Figure 1. Examples of marine life found in UK seas.

Figure 2. Schematic of the components of the UK MPA network that will contribute to meeting international MPA commitments.
At JNCC, we are very aware that getting ‘lines on maps’ is just one component of a wider cycle of work that is required to ensure MPAs deliver tangible conservation benefits. We conceptualise these activities as the ‘MPA cycle’, which is illustrated in Figure 4.

**Figure 3.** The UK MPA network (correct as of February 2018; acknowledgement: Y. Arjona).

**Figure 4.** The MPA cycle.
Step 1: Selection and designation

The process to identify and designate MPAs to develop the network around the UK has differed considerably between the four countries that make up the UK, albeit underpinned by the same general principles for establishing an MPA network as outlined above. These general principles have assisted with continuity and consistency across borders within the UK, working towards the same goal.

In England, the Marine Conservation Zone (MCZ) Project was set-up in 2008 by JNCC and Natural England. The project involved four regional projects that put stakeholders at the heart of the decision-making process. JNCC and Natural England worked collaboratively to provide guidance (Natural England & JNCC, 2010a) to the regional projects and ecological network guidance (Natural England & JNCC, 2010b) that provide the principles and targets to aim towards to help identification and selection of MCZs in each region. The regional projects ran until 2011 when the sites selected by stakeholders were recommended for designation. JNCC and Natural England have reviewed these recommendations and provided formal scientific advice to Government. Of the MPAs originally identified through these stakeholder-led projects, 50 have been designated to date, and work on a final tranche of MCZs is ongoing.

JNCC collaborated closely with colleagues from Marine Scotland and Scottish Natural Heritage to identify Nature Conservation MPAs in Scotland’s seas. The selection process was underpinned by the Scottish MPA Selection Guidelines (Marine Scotland, 2011) and largely undertaken by the public authorities who advise on the conservation of the marine environment in Scotland (including JNCC for Scottish offshore waters). That being said, critical points for engagement with sea users and others with a vested interest in the marine environment were undertaken, focussed at the beginning on building our understanding of the distribution of marine habitats and species and gaining a better understanding of the activities taking place within Scotland’s seas, and moving towards presenting the evidence base behind MPA proposals as they were developed and possible site management options. In this way, expectations around stakeholder involvement within the process were well-targeted and clear. The project culminated in the designation of 30 Nature Conservation MPAs in Scotland’s seas in 2014.

In both of these cases, the involvement of stakeholders from an early stage has been central to the process.

Critical to MPA selection and designation work in the UK has been developing an understanding of the progress of the existing MPA network, what it currently protects and where the perceived ‘gaps’ are to ensure new sites complement rather than duplicate the existing building blocks. JNCC have played a leading role in these assessments for the MPA network in England (JNCC, 2016a), Wales (JNCC, 2016b), Scotland (Cunningham et al., 2015) and Northern Ireland to help complete respective components of the UK MPA network. This has involved intensive data collation exercises, development of assessment methodologies and criteria to be applied to the assessment, and analysis of large-scale datasets to identify shortfalls in the network that need addressing.

Aichi Target 11 under the Convention on Biological Diversity also makes reference to ‘other effective area-based conservation measures’ as well as protected areas as contributing to the 10% protection target. JNCC have done some work in recent years to consider the contribution of other area-based measures (OABMs) to MPA networks in Scotland (Cunningham et al., 2011) and England (JNCC, 2016c). What is common to both approaches is that the following principles were considered important in determining whether a possible OABM makes a contribution to the MPA network:

- the possible OABM is large enough to offer a tangible conservation benefit to the feature(s) of interest, based on what is known about the viability of habitats and species present;
- sufficient management is already in place which offers effective protection to the feature(s) of interest based on what is known about the sensitivity of feature(s) of interest to pressures associated with human activities;
- the management in place has a degree of permanency considered suitable for achieving the favourable condition of feature(s); and
- there are opportunities to undertake condition monitoring within the possible OABM in order to assess whether favourable condition of the feature(s) is being achieved.

The candidate areas considered for the assessments conducted in England and Scotland included the following:

- Voluntary Marine Reserves;
- fisheries activity restriction areas;
- areas of military activity;
- safety exclusion zones around marine infrastructure; and
- shipping routes.

It is worth nothing that as a result of this process, only a small number of OABMs came out as delivering a tangible conservation benefit to the UK marine environment, comprising fisheries management areas around Scotland.

Step 2: Setting of objectives

At JNCC, we have learned that it is critically important to ensure that the conservation objectives set for MPAs are
as ‘SMART’ as possible (specific, measurable, achievable, realistic and time-bound). This is quite a difficult ask when considering the marine environment, in which there is a dearth of information on the current condition of habitats and species and on what ‘good’ condition might look like (this is particularly true of the UK’s offshore marine environment).

As a first step, we have used our understanding of the sensitivity of marine habitats and species to pressures (such as physical abrasion) associated with marine activities (such as fishing) to set high-level conservation objectives. This is done by considering levels of exposure to activities associated with pressures that habitats and species intended to be protected within MPAs are considered to be sensitive to. If a habitat or species is considered sensitive to pressures associated with activities taking place within an MPA, then a recover or restore conservation objective may be set. Conversely, if a habitat or species is not considered sensitive to pressures associated with activities taking place within an MPA or no activities are or have taken place that may have resulted in poor condition, then a maintain or conserve objective may be set.

Sea users must assess the degree to which their activities may hinder the achievement of a site’s conservation objectives. JNCC have been working on a new approach to setting and describing the conservation objectives of the protected features of offshore MPAs that sees high-level conservation objectives for each offshore MPA nested within a wider conservation advice ‘package’. The critical component of the conservation advice package is the Supplementary Advice on Conservation Objectives tables. These documents set out JNCC’s scientific understanding of the protected features of offshore MPAs and include site-level advice that sea users can usefully draw upon in considering whether their activities may impact the achievement of the conservation objectives of a given offshore MPA. An example conservation advice package is available on JNCC’s website, e.g. http://jncc.defra.gov.uk/page-6508.

**Step 3: Identification & management of threats**

Moving around the MPA cycle, JNCC have a critical role to play in providing advice to UK Governments on the management measures considered necessary to support the achievement of MPA conservation objectives and to best ensure we achieve a ‘well-managed’ network. Whilst understanding on what constitutes ‘well-managed’ in terms of an MPA or MPA network continues to develop, the OSPAR Commission have proposed a series of questions (OSPAR 2015) that seek information on the main actions involved in the management of an MPA:

- Is MPA management documented?
- Are measures to achieve conservation objectives being implemented?
- Is monitoring in place to assess if measures are working?
- Is the MPA moving towards or has it reached its conservation objectives?

Figure 5 provides a cumulative overview of ‘yes’ and ‘partial’ responses to these questions for UK MPAs (correct up to December 2016)

Figure 5 indicates that whilst the majority of UK MPAs have information documented on the management requirements to achieve the conservation objectives of MPAs, the implementation of those requirements is

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*Figure 5. Progress on the management of all MPAs in the UK.*
largely only partially complete (reflecting the fact that existing licencing processes are in place to manage the potential impacts of licensable activities in the UK such as oil and gas and aggregate extraction). A key strand of JNCC’s work moving forward is focused on advising UK Governments to support the implementation of fisheries management measures, which is currently undertaken in UK offshore waters through the European Commission as part of the Common Fisheries Policy Article 11 process (European Commission 2014). Figure 6 provides a snapshot of progress made on the development of fisheries management measures.

**Step 4: Monitoring**

Surveillance of the UK marine environment is a costly business, particularly in deeper waters further offshore. Effective collaboration and strategic deployment of resources are essential to best ensure we are meeting marine monitoring requirements. JNCC is currently leading on the development of a strategy for biodiversity monitoring across all UK waters, to include MPA monitoring. For MPAs, data and evidence collected from monitoring activities will aim to:

- enable assessment of condition of the features within sites;
- enable assessment of the degree to which management measures are effective in achieving the conservation objectives for the protected features;
- support the identification of priorities for future protection and/or management; and,
- enable UK Governments to fulfil its national and international assessment and reporting commitments in relation to MPAs and help identify where further action may be required.

To date, a number of baseline condition surveys of UK offshore MPAs have been undertaken to help develop the start of a time series to detect change in condition of the protected features of MPAs over time. We have also undertaken a number of research and development related surveys to help test new approaches and develop new condition indicators to operationalise in the future.

**Step 5: Assessment**

The final step in the process is to bring all the information together from the previous stages in the cycle and make conclusions on the degree to which your MPA network is achieving tangible conservation benefits for the marine environment. We are quite early on in this part of the process, but every six years JNCC will support reporting on achieving individual site and MPA network ambitions.

Critically, it is important that this part of the cycle feeds back through to the start as well as other stages in order to implement any changes to the MPA network as a result of lessons learned through the first ‘loop’ of the cycle. In the coming years, our work will focus more on the later stages in the cycle and as our understanding of the marine
environment improves we will be able to make firmer conclusions on the degree to which, in the UK, we are moving towards an ecologically-coherent and well-managed MPA network.

Lessons learnt

Well-targeted, meaningful and regular engagement with sea users and interest groups is critical to the execution of an effective MPA process – JNCC has worked on behalf of the UK governments to coordinate the participation of sea users in MPA selection and management processes, including the delivery of multiple large-scale workshops with national and international stakeholders. This has notably been during periods when marine stakeholder input has been required for several projects in addition to MPAs, including marine planning and marine management. Our experience has highlighted the importance of ensuring that the full range of stakeholders are given the opportunity to engage at strategic points in the process and the need to clearly set out roles from the outset.

It is vitally important to be open and transparent around levels of evidence underpinning the identification of MPAs – JNCC have actively developed tools such as protocols to ensure the consistent and transparent application of evidence underpinning MPA selection processes in the UK.

It is critical to draw on existing information sources on the presence and distribution of interest features (e.g. key habitats and species) and human activities before investing resource to collect additional evidence – In Scotland for example, JNCC worked with Marine Scotland and Scottish Natural Heritage to develop a ‘Geodatabase of Marine Features, Scotland’. This data collation exercise was underpinned by a stakeholder workshop with academics and other bio-physical data holders to ensure efforts to go out and collect additional information on marine habitats and species was well-targeted.

‘New’ MPA processes should take stock of existing MPAs and use these as a foundation for the need to select new sites – To avoid duplicating protection and causing undue disruption to sea users.

Underlying network principles are critical to keep in mind in the identification of new MPAs – This helps set clarity on expectations around the development of MPA networks and allows all those involved to understand the target.

Sufficient time should be built into the process to devise, discuss and implement effective management in order to stand the best chance of delivering a tangible conservation benefit from your MPA network – In Scotland for example, Management Options Papers were discussed with stakeholders during the site selection process and featured as part of MPA consultation materials.

This gave stakeholders a clear understanding of potential implications of any new designations on their activities.

Under financial constraint, MPA monitoring is best implemented as part of a wider strategy and plan that aims to achieve data collection requirements to fulfil multiple purposes – The work JNCC have been investing in a marine monitoring strategy is designed to deliver cost-effective marine monitoring options to Governments to fulfil multiple needs.

Effective communication is key – We have invested in the production of numerous communication products to better inform sea users, interest groups and the general public about MPAs in the UK. Our online MPA interactive map provides users with MPA boundary information and information on the distribution and extent of marine habitats and species protected within the UK MPA network. We have produced web-based ‘Site Information Centres’ for all UK offshore MPAs as a ‘one-stop shop’ for information that is easily accessible to all (see www.jncc.gov.uk/offshoreMPAs). We have also worked with partners to produce a series of MPA showcase videos, delivering information on the protected features of UK offshore MPAs in a more engaging manner. We will continue communicating complex information about offshore MPAs in an engaging and accessible style that is suitable for a wide range of stakeholders.

The future

While recognising the progress made in working towards an ecologically-coherent and well-managed MPA network in the UK marine environment, we acknowledge that there are still challenges ahead. Notably, there is uncertainty as well as potential opportunities around EU Exit and what this will mean for our marine environment. Moreover, designation as acknowledged throughout this article is only the first step in the wider MPA cycle. The need for effective and well-supported management, in a time when financial resources are limited, will require collaboration from the full range of stakeholder’s present in the offshore environment. By using new and improved technology we hope to accelerate our efforts and continue to provide robust and cost-effective evidence on the status of biodiversity across the UK. These steps, and others, will ensure that JNCC can continue to provide trusted and high-quality advice on MPAs in the UK offshore, which can be used to inform sustainable marine management.

References


