



<b>Scottish MPA Project</b> <b>Assessment against the MPA Selection Guidelines</b>
<b>TURBOT BANK NATURE CONSERVATION MPA</b>
<i>JULY 2014</i>

The following documents provide further information about the Turbot Bank Marine Protected Area (MPA):

- Site Summary Document
- Data Confidence Assessment
- Management Options Paper

The documents are all available at [www.jncc.defra.gov.uk/page-6490](http://www.jncc.defra.gov.uk/page-6490)

<b>Document Distribution List and Version Control</b>				
<b>Format</b>	<b>Version</b>	<b>Issue date</b>	<b>Version development and review</b>	<b>Issued to</b>
Electronic	1.0	11/07/2012	Internal drafting and review of pre-version 1.0 drafts by JNCC SMPA team prior to release to Marine Scotland Science for technical review.	Marine Scotland Science
Electronic	2.0	07/05/2013	Action of comments from Marine Scotland Science and Grade 7 staff prior to release to MPA Sub-Group.	MPA Sub Group
Electronic	3.0	07/06/2013	Review of document to take into account MPA Sub-Group comments, editorial review and Grade 7 review prior to release to MPA Sub Group for sign-off.	MPA Sub Group
Electronic	4.0	11/07/2013	Review of document to take into account MPA Sub-Group comments and release of document for public consultation.	Uploaded to JNCC website
Electronic	5.0	18/07/2014	Document update to align with designation status and text revised in response to consultation and independent review report	Delivery to Marine Scotland to support MPA designation and upload to JNCC website

## Background

This document provides details of JNCC's assessment of the Turbot Bank Nature Conservation MPA (herein referred to as 'MPA') against the [Scottish MPA Selection Guidelines](#). It presents an assessment for each of the protected features. We have used the terminology set out in the Selection Guidelines to describe the five main stages in the assessment process from the identification of MPA search locations through to an MPA.

*The main terms used are described below.*

MPA search feature - specified marine habitats, species and large-scale features which underpin the selection of Nature Conservation MPAs.

Geodiversity features - specified geodiversity interests of the Scottish seabed categorised under themed 'blocks' that are analogous to the MPA search features for biodiversity.

Protected feature - any feature (habitats, species, large-scale features and/or geodiversity features) which are specified in the MPA Designation Order.

MPA search location - this describes a location identified at stage 1 [of the Selection Guidelines] until it passes the assessment against stage 4.

Potential area for an MPA - if an MPA search location passes assessment against stage 4 it goes on to be considered at stage 5 as a potential area for an MPA.

Nature Conservation MPA – a location that has been approved by Ministers for designation.

Details of evidence supporting the designation of the Turbot Bank MPA are provided in the Data Confidence Assessment document.

## TURBOT BANK MPA - APPLICATION OF THE MPA SELECTION GUIDELINES

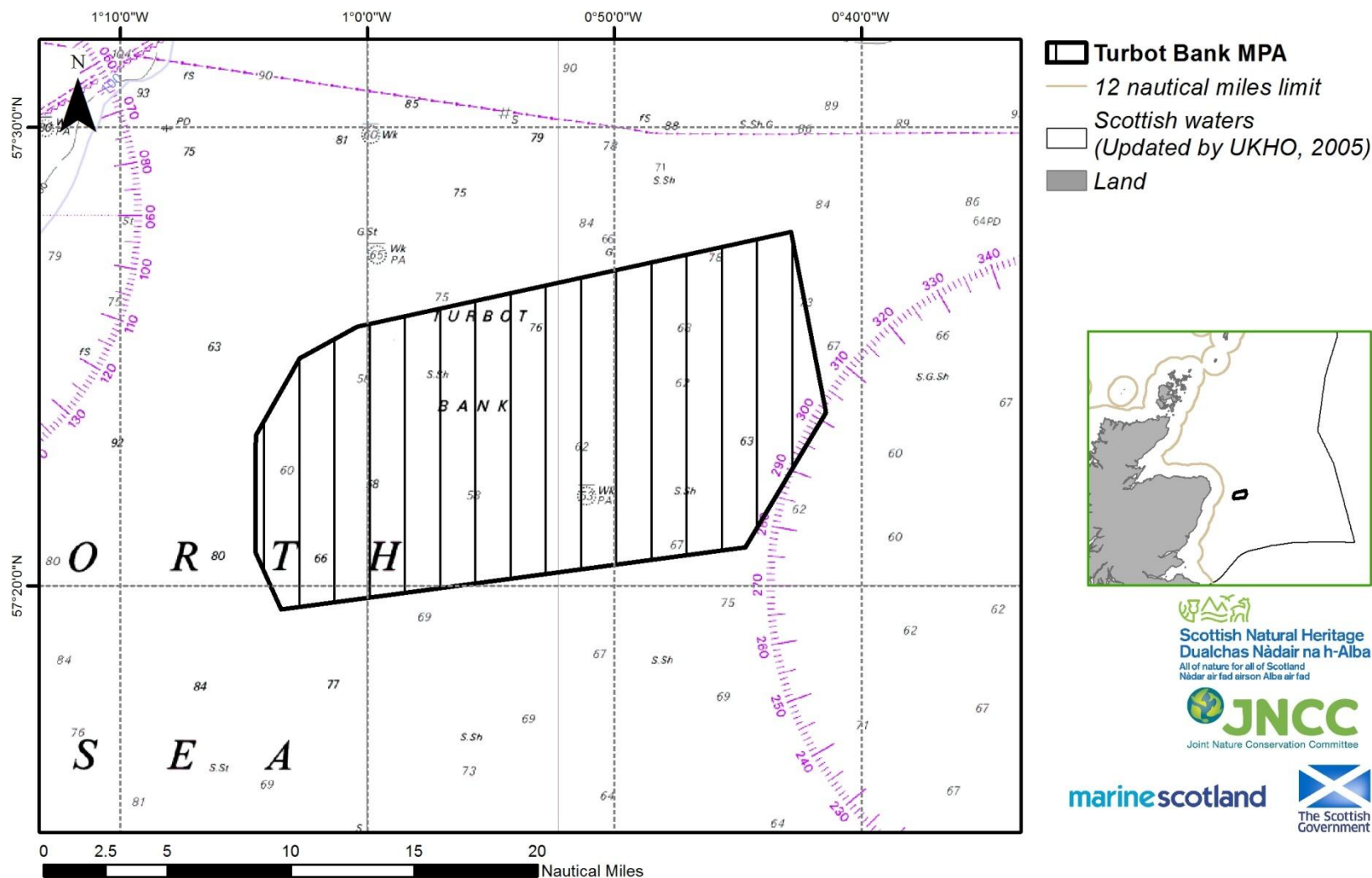
### Stage 1 - Identifying search locations that would address any significant gaps in the conservation of MPA search features

<b>Summary of assessment</b>	The location to the south and east of the Turbot Bank was identified as important for sandeels (specifically <i>Ammodytes marinus</i> within offshore waters) (Marine Scotland Science, 2012). Models predicting larval transport indicate that the sandeel larvae from Turbot Bank may be widely dispersed throughout the International Council for the Exploration of the Sea (ICES) Sandeel Area 4 (SA4) in the North Sea and occasionally outside this area (Proctor <i>et al.</i> , 1998; Christensen <i>et al.</i> , 2008). There are no Key Geodiversity Areas present.
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Detailed assessment			
Protected features	Guideline 1a <i>Presence of key features [MPA search features and geodiversity equivalents]</i>	Guideline 1b <i>Presence of features under threat and/or subject to rapid decline</i>	Guideline 1c <i>Functional significance for the overall health and diversity of Scottish seas</i>
<i>Biodiversity</i>			
Sandeels	✓	✓T&D <sup>1</sup>	✓ larval export

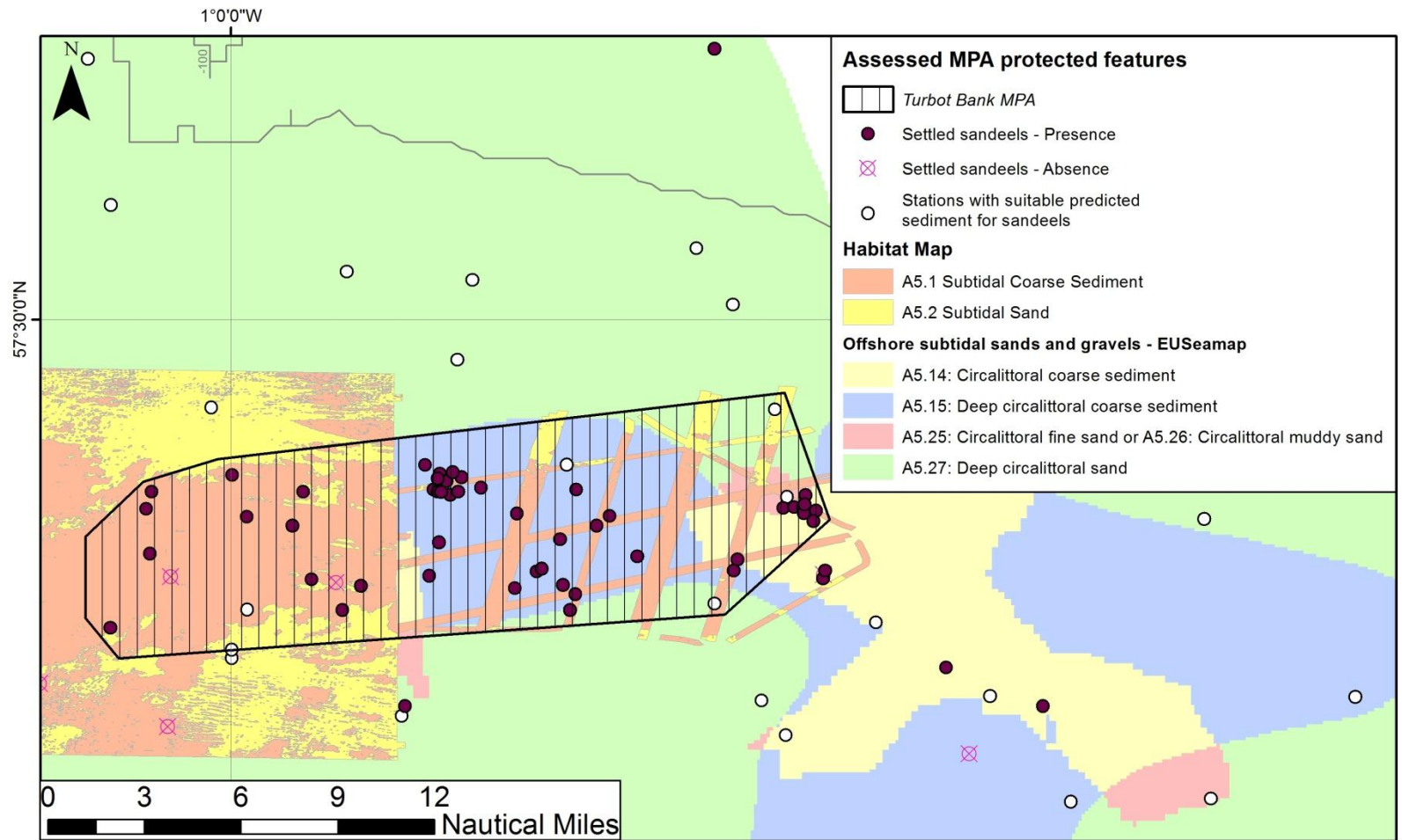
<sup>1</sup> The 2012 report of the Working Group on the assessment of Demersal stocks in the North Sea and Skagerrak suggest that sandeel abundance in Sandeel Area 4 shows some evidence of decline (ICES, 2012).

Map showing the location of the Turbot Bank MPA



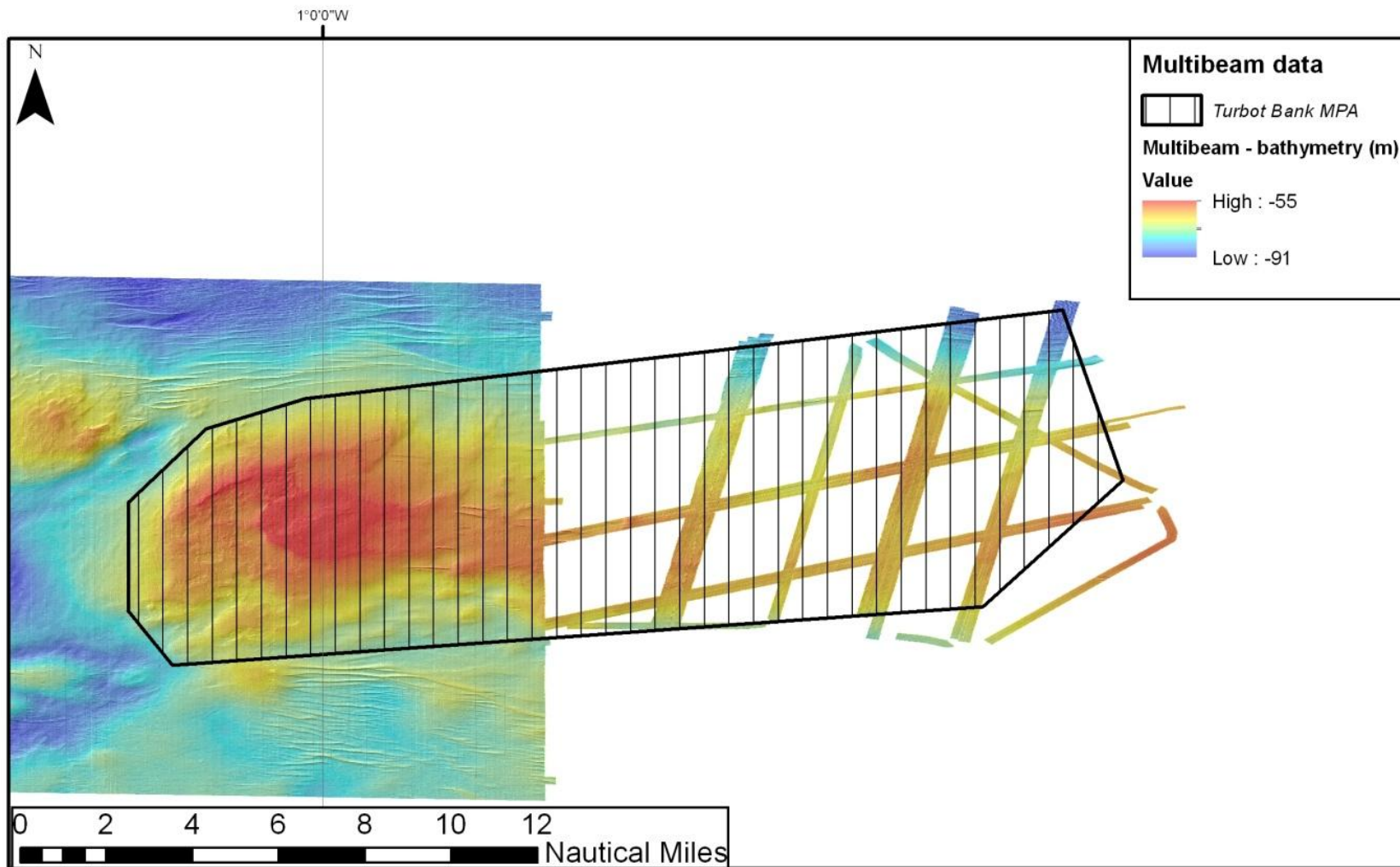
Map projected in Mercator (World) projection, geographic coordinate system WGS1984. The exact limits of the UK Continental Shelf are set out in the Continental Shelf (Designation of Areas) Order 2013, Statutory Instrument 2013/3162 (© Crown Copyright). Landmass, Ordnance Survey © Crown Copyright and database right 2011. All rights reserved. Scotland (Adjacent waters) Updated by the Law of the Sea Division, United Kingdom Hydrographic Office October 2005. MPA © JNCC and SNH, 2014. All rights reserved. Admiralty Chart © Crown Copyright, 2013. All rights reserved. License No. EK001-20130405. NOT TO BE USED FOR NAVIGATION

**Map of the Turbot Bank MPA showing the known distribution of protected features**



Map displayed in geographic coordinates WGS84. The exact limits of the UK Continental Shelf are set out in the Continental Shelf (Designation of Areas) Order 2013, Statutory Instrument 2013/3162 (© Crown Copyright). Landmass Ordnance Survey © Crown Copyright and database right 2011. All rights reserved. Scotland (Adjacent waters) Updated by the Law of the Sea Division, United Kingdom Hydrographic Office October 2005. Bathymetry © GEBCO, 2011. Biological data from Geodatabase of Marine features in Scotland (GeMSv4) © Crown Copyright; MPA areas © JNCC and SNH 2014. Habitat map © JNCC/CEFAS, 2012. MPA © JNCC and SNH 2014. All rights reserved. EUSeaMap © EUSeaMap consortium 2012 ([www.emodnet-seabedhabitats.eu](http://www.emodnet-seabedhabitats.eu))

**Map of the Turbot Bank MPA showing the extent of the Turbot Bank shelf bank and mound feature based on multibeam data**



Map displayed in geographic coordinates WGS84. The exact limits of the UK Continental Shelf are set out in the Continental Shelf (Designation of Areas) Order 2013, Statutory Instrument 2013/3162 (© Crown Copyright). Landmass Ordnance Survey © Crown Copyright and database right 2011. All rights reserved. Scotland (Adjacent waters) Updated by the Law of the Sea Division, United Kingdom Hydrographic Office October 2005. Multibeam data © UKHO (2009) and JNCC, CEFAS (2012). MPA © JNCC and SNH 2014. All rights reserved.

## Stage 2 - Prioritisation of search locations according to the qualities of the MPA search features they contain

### Summary of assessment

The MPA is considered important to the life history of sandeels, particularly as a source for the export of larvae to sandeel grounds to the south and east of Turbot Bank (Marine Scotland Science, 2012). Models predicting larval transport indicate that the larvae from Turbot Bank may be widely dispersed throughout ICES SA4 in the North Sea, and occasionally beyond this area (Proctor *et al.*, 1998; Christensen *et al.*, 2008).

Turbot Bank represents a viable example of the species population and an important component of a larger population that forms the ICES SA4 (Marine Scotland Science, 2012). The association between the sandeels with sediment types within the MPA is typical of that known for the species (Wright *et al.*, 2000).

Whilst sandeels have been fished within the MPA in the past, the reduction in fishing effort over more recent times and their relatively short lifecycle means that sandeels within the MPA may now be expected to have close to a natural age and size composition (Boulcott *et al.*, 2007). Consequently, the sandeel population is not considered to have been significantly modified by human activity. Sandeels are considered to be at high risk of being significantly damaged by human activity in the MPA Region<sup>2</sup>.

**JNCC conclude that all the relevant stage 2 guidelines are met for sandeels.**

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<sup>2</sup> East (Offshore) MPA Region as described in the [Scottish MPA Selection Guidelines](#)



<b>Detailed assessment</b>	
<b>Guideline 2a     The search location contains combinations of features, rather than single isolated features, especially if those features are functionally linked</b>	
The MPA is designated for a single protected feature – sandeels. The MPA is important to the life history of sandeels, particularly as a source for the export of larvae to sandeel grounds to the south and east of Turbot Bank (Marine Scotland Science, 2012). Models predicting larval transport indicate that the larvae from Turbot Bank may be widely dispersed throughout SA4 in the North Sea and occasionally beyond this area (Proctor <i>et al.</i> , 1998; Christensen <i>et al.</i> , 2008).	
<b>Guideline 2b     The search location contains example(s) of features with a high natural biological diversity (for habitats only)</b>	
N.A – The guideline is applicable to habitats only.	
<b>Guideline 2c     The search location contains coherent examples of features, rather than smaller, potentially more fragmented ones</b>	
Sandeels	Sandeels are found in large aggregations within areas of suitable sediments – i.e. those with a low silt/clay fraction (Wright <i>et al.</i> , 2000). All sandeel records within the MPA (based on Marine Scotland Science (MSS) east coast sandeel dredge survey data from 2008-2011, and more recent data collected in 2012 as part of survey of the seabed habitats present on and around Turbot Bank (Eggleton <i>et al.</i> , 2013)) were present in coarse and sandy sediments, demonstrated by Particle Size Analysis data from the British Geological Survey and seabed habitat mapping data from Sotheran & Crawford-Avis (2014) and are therefore considered typical. Sandeels have high site-fidelity post-settlement. Larval data and fishery landings information indicate that sandeels in vicinity of Turbot Bank are an important component of a larger patchy population that forms the ICES SA4. Models of larval transport indicate that the larvae from Turbot Bank may be widely dispersed throughout SA4 and occasionally outside this area (Proctor <i>et al.</i> , 1998; Christensen <i>et al.</i> , 2008). Overall, our assessment is that the area for sandeels is considered to be a coherent example of the feature.
<b>Guideline 2d     The search location contains features considered least damaged / more natural, rather than those heavily modified by human activity<sup>3</sup></b>	
Sandeels	Following the North East UK sandeel fishery closure in 2000, the industrial sandeel fishery in Scottish waters has decreased significantly. Although in the past an intensive industrial sandeel fishery existed off the East coast of Scotland, no targeted fishery for sandeels has taken place within the MPA in recent years, although the area is still outside the fishery closure area. The MPA sits within the Sandeel Area 4 management unit for which there is currently a very limited Total Allowable Catch for sandeels. As such, JNCC consider that sandeels on, and in vicinity of, Turbot Bank may now be expected to have close to a natural age and size composition because of the relatively fast turnover rate of the species (Boulcott <i>et al.</i> , 2007). JNCC consider that the guideline has been met.

<sup>3</sup> The least damaged/more natural stage 2d assessment considers protected feature exposure to activities associated with pressures to which the features are sensitive. This is distinct from the work outlined in Chaniotis *et al.* (2011), which mapped available activities data at the scale of Scotland's seas to identify broad areas of low/no activity from which to identify MPA search locations in the initial phase of the MPA selection process. Unlike the stage 2d assessment, Chaniotis *et al.* (2011) did not consider the sensitivity of features to pressures.

<b>Guideline 2e The search location contains features considered to be at risk<sup>4</sup> of significant damage by human activity</b>	
Sandeels	JNCC consider the protected feature to be at high risk in the MPA Region (Chaniotis <i>et al.</i> , 2014). This risk is primarily driven by the pressures associated with otter trawling (using specialised small mesh use) that is used to target sandeels. Evidence from some North Sea sandeel fisheries indicates there is a potential for localised depletion of grounds due to the high site-fidelity of settled sandeels (ICES, 2010).

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<sup>4</sup> Information on the sensitivity of the biodiversity protected features to pressures and their associated activities was taken from Marine Scotland (2013). The degree to which a feature is exposed to activities associated with pressures to which it is sensitive in each MPA Region (as described in the [Scottish MPA Selection Guidelines](#)) was assessed to provide a qualitative measure of risk. Risk assessments for the various activities were examined to produce an overall qualitative risk assessment by MPA Region. The conclusions do not reflect the level of risk at the scale of the MPA.

<b>Stage 3 - Assessment of the appropriate scale of the search location in relation to the search features it contains</b>	
<b>Summary of assessment</b>	<b>The MPA boundary has been drawn to reflect the known distribution of relatively high densities of sandeels on, and in the vicinity of, the Turbot Bank feature, and incorporates the habitats suitable for colonisation by sandeels.</b>
<b>Detailed assessment</b>	
<b>The size of the search location should be adapted where necessary to ensure it is suitable for maintaining the integrity of the features for which the MPA is being considered. Account should also be taken where relevant of the need for effective management of relevant activities</b>	
Sandeels	The boundary of the MPA has been drawn to focus on the sample records of relatively high densities of sandeels together with areas of those sediments considered suitable for colonisation by sandeels in the vicinity of Turbot Bank. Sandeels population data were drawn from the Marine Scotland Science (MSS) east coast sandeel dredge survey data from 2008-2011, and more recent samples collected in 2012 as part of a survey of the seabed habitats present on and around Turbot Bank (Eggleton <i>et al</i> , 2013). Information on suitable sediments is based on the analysis in Wright <i>et al</i> . (2000) and the seabed habitat mapping work by Sotheran & Crawford-Avis (2014). The boundary to the west reflects the full extent of the Turbot Bank shelf bank and mound feature based on interpretation of high resolution multibeam and backscatter data. This area is included because sandeels have been reported to aggregate in dense schools at the edge of banks, which may represent areas preferred for feeding (Van der Kooij <i>et al.</i> , 2008).

**Stage 4 - Assessing the potential effectiveness of managing features within a search location as part of a Nature Conservation MPA**

<b>Summary of assessment</b>	<b>There are mechanisms under the EU Common Fisheries Policy to introduce spatial and/or temporal management measures to conserve sandeels within the MPA. For licensed activities, JNCC consider any impacts could be addressed through the Environmental Impact Assessment (EIA) process. There is therefore the potential for management measures to be implemented successfully to achieve the conservation objective for sandeels in the MPA.</b>
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**Detailed assessment**

**There is a high probability that management measures, and the ability to implement them, will deliver the objectives of the MPA**

The purpose of the MPA is to minimise mortality of sandeels from anthropogenic pressures in the Turbot Bank area to promote the opportunity for larval export. There are mechanisms under the Common Fisheries Policy to introduce spatial/temporal fisheries measures to conserve sandeels within the MPA. Should licensed activities occur within the MPA in the future, JNCC consider that any potential impacts could be addressed through the EIA process. There is therefore potential for management measures to be implemented successfully and the sandeel feature to achieve its conservation objective. Further discussion concerning management of the protected features of the MPA is provided in the Turbot Bank Management Options Paper.

<b>Stage 5 - Assessment of the contribution of the potential area to the MPA network</b>	
<b>Summary of assessment</b>	The MPA makes a contribution to the MPA network for the protection of sandeels. Specifically, the sandeel population from Turbot Bank is considered an important source for the export of individuals to support the recruitment in grounds throughout Sandeel Area 4.
<b>Detailed assessment</b>	
<b>The potential area contributes significantly to the coherence of the MPA network in the seas around Scotland</b>	
<b>Assessment of biodiversity features</b>	
<b>Feature</b>	<b>Summary</b>
Sandeels	The MPA provides representation in the network for part of the north-west sub-population of sandeels (ICES SA4). Models predicting larval transport indicate that the larvae from Turbot Bank may be widely dispersed throughout SA4 and occasionally beyond this area (Proctor <i>et al.</i> , 1998; Christensen <i>et al.</i> , 2008). The MPA is therefore considered a source of export of sandeels to these wider populations. The sandeels adequacy assessment provides further information (SNH and JNCC, 2014).

### Data sources and bibliography

- Boulcott, P., Wright, P.J, and Gibb, F. (2007). *Regional variation in maturation of sandeels in the North Sea*. ICES Journal of Marine Science, **64**:369–376.
- Chaniotis., P.D., Crawford-Avis, O.T., Cunningham, S., Gillham, K., Tobin, D., Linwood, M. (2011). *Identifying locations considered to be least damaged/more natural in Scotland's seas*. Report produced by the Joint Nature Conservation Committee, Scottish Natural Heritage and Marine Scotland for the Scottish Marine Protected Areas Project.
- Chaniotis, P.D., Cunningham, S., Gillham, K., Epstein, G. (2014). *Assessing risk to Scottish MPA search features at the MPA regional scale*. Final report produced by the Joint Nature Conservation Committee, Scottish Natural Heritage and Marine Scotland for the Scottish Marine Protected Areas Project.
- Christensen, A., Jensen, H., Mosegaard, H., St John, M., and Schrum, C. (2008). *Sandeel (*Ammodytes marinus*) larval transport patterns in the North Sea from an individual-based hydrodynamic egg and larval model*. Canadian Journal of Fisheries and Aquatic Sciences, **65**:1498–1511.
- Eggleton, J., Diesing, M. & Schinaia, S., (2013). *Offshore seabed survey of Turbot Bank possible MPA*, CEFAS Report C5817.
- ICES (2010), *Report of the benchmark workshop on sandeel (WKSAN)* 6-10 September 2010, Copenhagen, Denmark, ICES CM2010/ACOM: 57. 201pp
- ICES (2012). *Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSKK)*. 27<sup>th</sup> April – 3<sup>rd</sup> May, Copenhagen, Denmark, ICES CM2012/ACOM:13. 1346pp.
- Marine Scotland Science (2012). *Marine Protected Areas and sandeels (*Ammodytes marinus* & *Ammodytes tobianus*)*. Position paper for 4th MPA Workshop, Heriot-Watt University, 14-15 March 2012. Available online: <<http://www.scotland.gov.uk/Resource/0038/00389460.doc>>.
- Proctor, R., Wright, P. J., and Everitt, A. (1998). *Modelling the transport of larval sandeels on the north-west European shelf*. Fisheries Oceanography, **7**: 347–354.
- SNH & JNCC (2014). *Assessment of the adequacy of the Scottish MPA network for MPA search features: summary of the application of the stage 5 selection guidelines*. Final report produced by Scottish Natural Heritage, the Joint Nature Conservation Committee and Marine Scotland for the Scottish Marine Protected Areas Project.
- Sotheran, I. & Crawford-Avis, O. (2014). *Mapping habitats and biotopes to strengthen the information base of Marine Protected Areas in Scottish waters*. JNCC Report 503.
- Van der Kooij, J. Scott, B.E., Mackinson, S. (2008). *The effects of environmental factors on daytime sandeel distribution and abundance on the Dogger Bank*. Journal of Sea Research (**60**): 201-209.
- Wright, P.J., Jensen, H. and Tuck, I. (2000). *The influence of sediment type on the distribution of the lesser sandeel, *Ammodytes marinus**. Journal of Sea Research, **44**(3-4): 243-256.