



**Fisheries Management Options Paper:  
SOLAN BANK REEF SPECIAL AREA OF CONSERVATION**

**JNCC**

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## 1. Management Options Summary

**Table 1.** Fisheries management options for mobile and static bottom contact fishing gears.

| Fishing Activity                          | Management options  |
|---|---|
| <p><b>Mobile bottom contact gears</b></p> | <p><b>No additional management:</b> There is a significant risk of not achieving the conservation objectives for the <b>reef</b> features.</p> <p><b>Reduce/limit pressures:</b> This option would reduce the risk of not achieving the conservation objectives for the <b>reef</b> feature. Appropriate management could include exclusion of mobile bottom contact gears over the main areas of <b>bedrock and stony reef</b>, allowing fishing to continue in fishable areas between the features. It is possible that these areas may include some areas where the distribution of <b>reef</b> is unknown or uncertain, and some very small areas of known Annex I <b>reef</b>. There would therefore be a risk of localised damage to the structure and function of <b>reef</b> communities in these areas. The location of areas to be covered by management restrictions would include a buffer zone to reduce any risk of accidental contact with the feature. The location of areas to be covered by management restrictions would be decided in consultation with fishers.</p> <p><b>Remove/avoid pressures:</b> This option would reduce the risk not achieving the conservation objectives for the <b>reef</b> feature within the site boundary to the lowest possible levels. Restrictions would be required for all mobile bottom contact gears within the full extent of the site boundary. The site boundary already includes a buffer zone based on a ratio of 3:1 fishing warp length to depth around the known features to reduce any risk of accidental contact with the feature.</p> |
| <p><b>Static bottom contact gears</b></p> | <p><b>No additional management:</b> This option is considered to be sufficient for bottom contacting static gear to achieve the conservation objectives for the <b>reef</b> feature. However, if monitoring showed evidence of detrimental effects as a result of static gear activity in the future, additional management may be required.</p> <p><b>Reduce/limit pressures:</b> This option would further reduce the risk of not achieving the conservation objectives for the <b>reef</b> feature. If fishing activity were to rise to levels at which damage was occurring, appropriate management could include partial closure of the feature and/or limits on the amount of gear that can be deployed.</p>  |

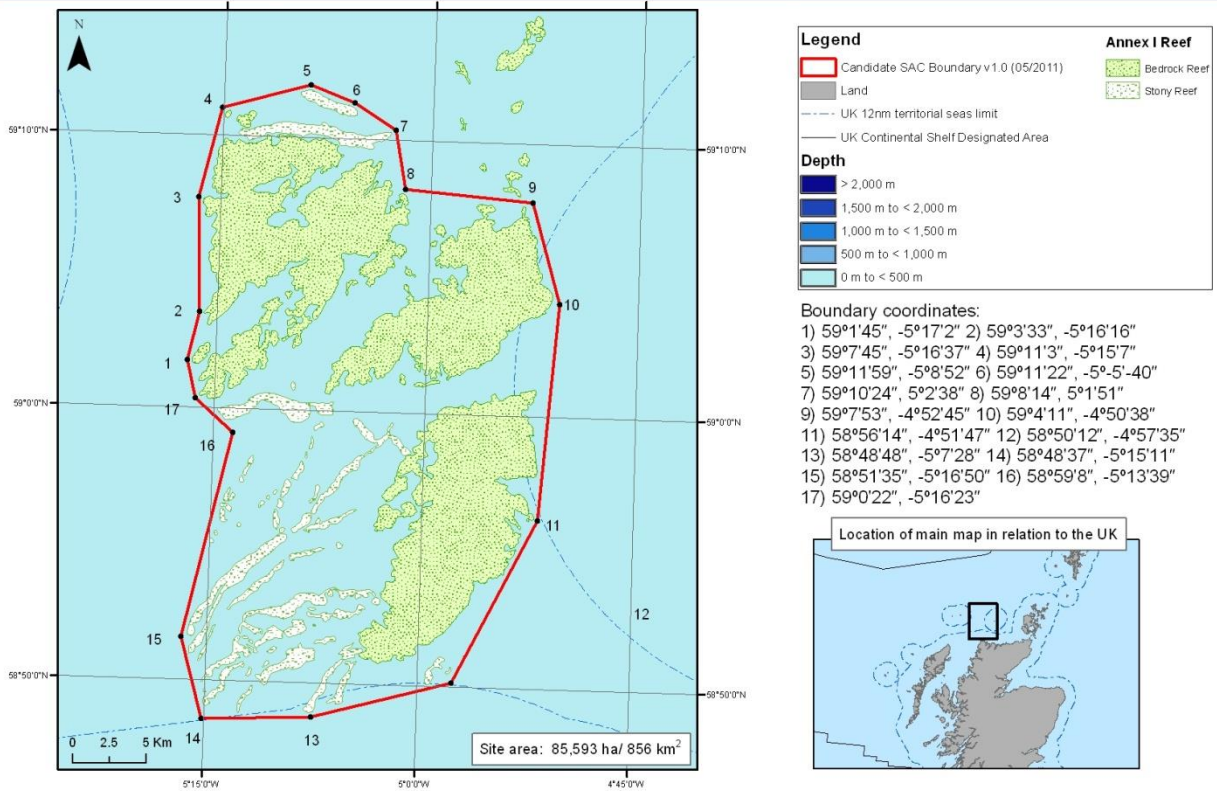
## 2. Introduction

The Solan Bank Reef site (Figure 1) crosses the 12 nautical mile boundary; therefore, it lies partly in inshore and partly in offshore waters. The site is located approximately 50km north of Cape Wrath on the Scottish mainland. The majority of the site lies in water depths of 60 – 80m. However, to the south-east of the site an outcrop of bedrock reef rises to approximately 20m below the sea surface whilst the north of the site extends to more than 90m water depth.

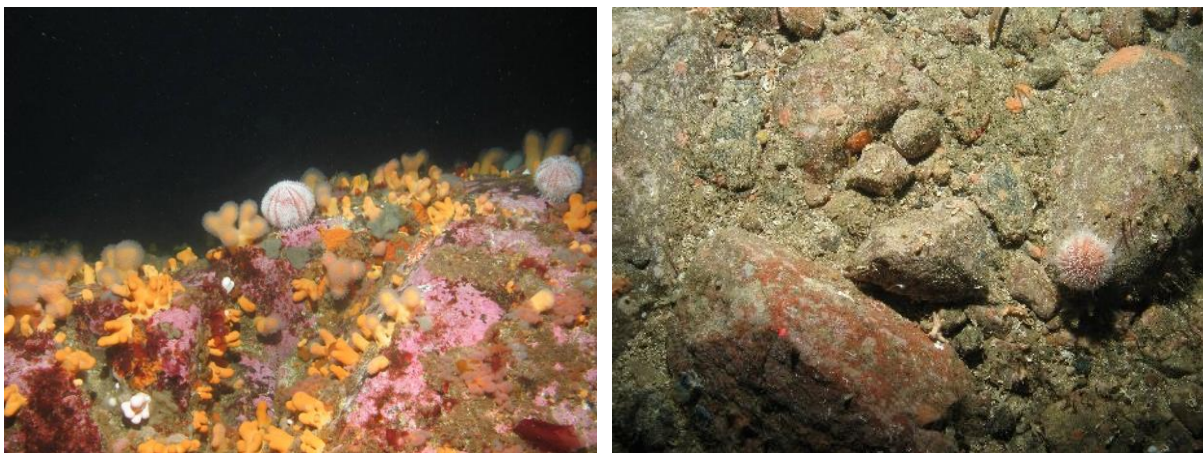
The site represents the Annex I reef sub-types ‘bedrock’ and ‘stony’ reef (Figure 2). Bedrock outcrops create areas of high topography, with linear features, thought to be bedrock joint planes, forming cliffs with relief of up to 10m. In areas of bedrock where lineations are not as prominent, bedrock outcrops are smooth and undulating, forming features known as roches moutonnées (Sugden *et al.* 1992). Stony reef, comprised of boulders and cobbles with a sandy veneer, occurs in ridges to the north-west and south-west of the site. These features are present across the site and are likely to be glacial in origin, representing morainic ridges (Whomersley *et al.* 2010). Boulders and cobbles also occur in the larger crevices in the bedrock whilst smaller fissures in the bedrock are infilled with a mixture of coarse sand and shell gravel veneer. A veneer of sand is also present over the flat bedrock surfaces, indicating that sediment scour is a significant factor across the site.

The reefs support encrusting bryozoans, encrusting coralline algae, caryophyllid cup corals and ophiuroids (brittlestars). Highly sediment-scoured bedrock is mainly colonised by the keel worm *Pomatoceros triqueter*. Less-scoured bedrock supports a range of sponges, bryozoans, and hydroids. In shallower areas with increased water movement there is an increasing abundance of the soft coral, *Alcyonium digitatum*, the cup coral, *Caryophyllia smithii* and the jewel anemone, *Corynactis viridis*, with red algae and kelp in the shallowest areas.

## Offshore Special Area of Conservation Site Map: Solan Bank Reef



**Figure 1.** Site map of Solan Bank Reef SAC, showing its location in relation to the UK, water depth, and Annex I reefs within its site boundary.



**Figure 2.** Examples of Annex I 'Reef' habitat within the Solan Bank Reef SAC.  
 Left image: Soft coral (*Alcyonium digitatum*), common sea urchin (*Echinus esculentus*) and encrusting coralline algae on shallow circalittoral bedrock reef, (©JNCC, 2008).  
 Right image: Stony reef with encrusting sponges, faunal turf, and the common sea urchin (*Echinus esculentus*), (©JNCC, 2012).

### 3. Protected features and conservation objectives

The Solan Bank Reef SAC contains the Annex I habitat 'Reef'.

Conservation objectives set out the desired quality of the protected features within each MPA. They are a set of site specific objectives to be met in order for a site to maximise its contribution to Favourable Conservation Status.

The conservation objective for the SAC is to, subject to natural change, maintain or restore the reef at/to favourable condition, such that the following are maintained or restored:

- the natural environmental quality and processes supporting the habitat;
- the extent of the habitat on site;
- the physical structure, community structure, function, diversity and distribution of the habitat and typical species representative of the reef in the Northern North Sea regional sea.

Thereby ensuring the integrity of the site, and also making an appropriate contribution to favourable conservation status of the Annex 1 habitats.

### 4. Roles

The role of JNCC is to advise the Scottish Government on management options for the Solan Bank Reef SAC. In doing this, JNCC's aim is to ensure the conservation objectives for the protected features are met.

Marine Scotland will lead discussions on management with stakeholders. They will consider JNCC's advice and will lead on the development of specific management measures. They will be responsible for making recommendations to Scottish Ministers on these measures.

Stakeholders can provide additional evidence to support the development of management measures, including local knowledge of the environment and activities. Discussions with stakeholders will be one way of highlighting the implications of any management measures to both JNCC and Scottish Government. This will contribute to the development of well-designed and effective management measures.

### 5. Effect of fishing on the features

Whilst it is unlikely that mobile bottom contact gear can affect the long-term natural distribution of **bedrock and stony reef** features, there is evidence to indicate that the use of bottom contacting mobile gears can impact the structure and function of the habitat and the long term survival of its associated species.

The use of towed fishing gears is likely to cause damage or death of fragile, erect species, such as sponges and corals (Løkkeborg 2005, Freese *et al.* 1999). Other species such as hydroids, anemones, bryozoans, tunicates, and echinoderms may also be vulnerable (McConnaughey *et al.* 2000, Sewell and Hiscock 2005). Where fragile, slow growing

species occur, even low levels of fishing have the potential to change the structure and function of the habitats and may result in the loss of some characteristic species.

Mechanical impacts of static gear (e.g., weights and anchors hitting the seabed, hauling gear over seabed, rubbing/entangling effects of ropes) can damage some species (Eno *et al.* 1996). Other species appear to be resilient to individual fishing operations, but the effects of high fishing intensity are unknown (Eno *et al.* 2001). Recovery will be slow (Foden *et al.* 2010) resulting in significant reduction or even loss of characteristic species. The individual impact of a single fishing operation may be slight but cumulative damage may be significant (Eno *et al.* 2001; Foden *et al.* 2010).

## 6. Development of management options

Management options are being developed where we consider that some form of management may be necessary to achieve the conservation objectives for the feature. The approach to identifying management options for each activity will be risk-based, i.e., we are focusing on providing advice where we believe there is a risk to achieving the conservation objectives. To do this, we are using existing data and information on protected features and relevant activities, and also our understanding of the relationships between the feature and relevant activities.

We have identified risks to achieving the conservation objectives where there is an overlap between protected features and activities associated with pressures the features are sensitive to. Our identification of the risk has been refined using available information on the interaction between the features and activities where this is available (see section 5). We have recommended management options to manage this risk. The text focuses on interactions in terms of physical overlap but the assessment of risk in future should also take account of the intensity and frequency of activities within the SAC.

Specific details of the recommended management options for mobile bottom contact and static bottom contact gears are provided in Tables 3 & 4.

A gradient of management options has been considered to reduce the feature's exposure to pressures. These have been described under three potential management option categories:

- a) **No additional management** - where there are currently no site specific fisheries management measures in place and these are not deemed necessary at this time to achieve the conservation objectives for the site.
- b) **Additional management to reduce pressures** – where fisheries managers may wish to consider a range of measures that could be used to reduce the risk to features by managing fishing activity. These could include:
  - Area restrictions (permanently closing some or all of the feature's area – note this option may be limited due to recent evidence on distribution of the feature.
  - Gear restrictions (e.g. restricting use of the more damaging gears)

Ideally, any measures would generally apply only to the part of the site where the feature is present. However, there may be some circumstances in which it could be desirable to extend management measures beyond the known area of feature distribution, for example, where conditions are suitable for a feature to exist but there are insufficient data to confirm its presence.

- c) **Additional management to remove pressures** – where fishing activities known to adversely affect the feature would be excluded. Such exclusion would generally apply only to the part of the site where the feature is present, although it may occasionally be necessary to apply them to a wider area.

We recognise that stakeholders can provide local environmental knowledge and more detailed information on activities, including distribution and intensity of effort, frequency of activity, and fishing methods employed. This additional information will help us to develop more specific management options, focussed on interactions between features and activities. If new information becomes available during discussions, the management options may be revised.

## 7. Overview of activities

Table 2 below lists fishing activities which take place within or close to the Solan Bank Reef SAC. Further discussions with those who use the area will improve our understanding of these activities (distribution and intensity etc). Those fishing activities which the protected features are sensitive to are explored in greater detail in the next section. Fishing activities which the protected features are not thought to be sensitive to (i.e. any connection between the activity and the features is considered to be minimal) will not be considered further within this document. New or other fishing activities not identified within the table would need to be considered on a case-by-case basis.

**Table 2.** Overview of existing fishing activities believed to take place within or close to the Solan Bank Reef SAC (UK gear types only). \*Only the specific examples of activities listed in the table have been excluded, rather than the broad activity types.

| Activities considered capable of affecting the integrity of the SAC   | Activities <i>not</i> considered capable of affecting the integrity of the SAC*   |
|---|---|
| <ul style="list-style-type: none"> <li>• Demersal otter trawling</li> <li>• Demersal twin trawling</li> <li>• Demersal pair trawling</li> <li>• Dredges</li> <li>• Potting</li> <li>• Seine netting</li> <li>• Set longlines</li> </ul> | <ul style="list-style-type: none"> <li>• Mid-water otter trawling</li> <li>• Mid-water pair trawling</li> <li>• Purse seines</li> </ul> |

Non-UK nationalities with interest in the relevant ICES rectangles:

- France;
- The Netherlands;
- Denmark;
- Finland;
- Faroe Islands;
- Ireland;
- Norway.



## 8. Management options

**Table 3.** Management options for static bottom contact gear.

| Management option                |   |
|----------------------------------|---|
| <b>No additional management:</b> | This option is considered to be sufficient for bottom contacting static gear to achieve the conservation objectives for the <b>reef</b> feature. However, if monitoring showed evidence of detrimental effects as a result of static gear activity in the future, additional management may be required.                    |
| <b>Reduce/limit pressures:</b>   | This option would further reduce the risk of not achieving the conservation objectives for the <b>reef</b> feature. If fishing activity were to rise to levels at which damage was occurring, appropriate management could include partial closure of the feature and/or limits on the amount of gear that can be deployed. |

**Table 4.** Management options for mobile bottom contact gear.

| Management option                |   |
|----------------------------------|---|
| <b>No additional management:</b> | There is a significant risk of not achieving the conservation objectives for the <b>reef</b> features.  |
| <b>Reduce/limit pressures:</b>   | This option would reduce the risk of not achieving the conservation objectives for the <b>reef</b> feature. Appropriate management could include exclusion of mobile bottom contact gears over the main areas of <b>bedrock and stony reef</b> , allowing fishing to continue in fishable areas between the features. It is possible that these areas may include some areas where the distribution of <b>reef</b> is unknown or uncertain, and some very small areas of known Annex I <b>reef</b> . There would therefore be a risk of localised damage to the structure and function of <b>reef</b> communities in these areas. The location of areas to be covered by management restrictions would include a buffer zone to reduce any risk of accidental contact with the feature. The location of areas to be covered by management restrictions would be decided in consultation with fishers. |
| <b>Remove/avoid pressures:</b>   | This option would reduce the risk not achieving the conservation objectives for the <b>reef</b> feature within the site boundary to the lowest possible levels. Restrictions would be required for all mobile bottom contact gears within the full extent of the site boundary. The site boundary already includes a buffer zone based on a ratio of 3:1 fishing warp length to depth around the known features to reduce any risk of accidental contact with the feature.  |

## 9. Conclusions and further recommendations

Fisheries management measures for the Solan Bank Reef site will be developed through discussion with stakeholders. Discussions will focus on our understanding of the features and the likely risks to the designated features where there are interactions with fishing activities. Based on the options presented here, it is hoped that a preferred set of management options will be recommended.

## 10. Further information

The following documents about the Solan Bank Reef SAC are available from the JNCC website:

[Solan Bank Reef SAC Selection Assessment document, Version 5 \(October 2012\)](#)

[Solan Bank Reef Conservation Objectives and Advice on Operations, Version 3 \(March 2013\)](#)

## 11. References

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