

Scottish MPA Project Fisheries Management Guidance
Sandeels (<i>Ammodytes marinus</i> and <i>A. tobianus</i>)
July 2014

The fisheries management guidance has been produced to provide advice on the impact various fishing activities may have on MPA search features in Scotland's seas. The advice is organised by features and gear types. Fishing gears are grouped to combine those with broadly similar impacts, but where there is likely to be variation within a group of features (e.g. for high and low energy sand habitats), this has been taken into account. Where possible the guidance has been based on evidence from peer-reviewed scientific journals.

The advice on fisheries management falls into three broad categories:

- Gear/feature combinations that are unlikely to cause unacceptable impacts (except possibly at very high levels of effort) and so no additional management is likely to be required;
- Gear/feature combinations that are likely to cause unacceptable impacts and for which no possible mitigation measures could be identified at this stage other than closure to that gear;
- Gear/feature combinations that are likely to cause some degree of impacts but for which management may be possible to mitigate the effects (e.g. modification or restriction of certain gears, partial or temporary area closures, effort limitation).

In the last type of cases in particular, further site-specific evidence gathering and discussion with stakeholders will be required to determine the appropriate management measures.

The fisheries management guidance has been used, along with the FEatures Activities Sensitivities Tool ([FEAST](#)), to inform the development of management options papers for each possible MPA.

Document version control		
Version 0	Tom Blasdale (JNCC) Date prepared (20/05/2012)	First Draft
Version 0.1	Peter Wright (MSS) Date prepared (17/07/2012)	Review
Version 0.2	Tom Blasdale (JNCC) Date prepared (1707/2012)	Incorporating Review comments from Marine Scotland Science
Version 0.3	Kirstie Dearling (SNH)	Review
Version 0.4	Peter Wright (MSS)	Review of draft agreed by SNH and JNCC
Version 0.5	Pete Chaniotis (JNCC)	Incorporation of comments from MSS.
Version 1	Tom Blasdale (JNCC)	Review
Version 1.1	Beth Flavell (JNCC)	Incorporation of comments
Version 1.2	David Donnan (SNH)	Document review
Version 2.0	Beth Flavell (JNCC)	Prepare for upload to JNCC website

Sandeels (*Ammodytes marinus* & *A. tobianus*)

Sandeels are small, eel-like fish which form large shoals and spend a large part of their life buried in seabed sediments. The larvae drift with currents before settling on suitable areas of coarse sand with low silt content. This requirement for a highly specific sediment type results in a patchy distribution^{1,2}. Tagging studies and differences in growth rates indicate that, once they have settled on the seabed, sandeels remain settled within a small area^{3,4}. This means that local aggregations may be easily depleted.

Sandeels are an important component of marine food webs providing food for many species of marine predators such as seabirds, mammals and fish. Local depletion of sandeel aggregations at a distance less than 100 km from seabird colonies may affect some species of birds, especially black-legged kittiwake and sandwich tern. Of the five species of sandeels inhabiting the North Sea, the lesser sandeel, *Ammodytes marinus* is the most abundant and comprises over 90% of sandeel fishery catches.

Impacts

Targeted sandeel trawl fisheries

Sandeels are targeted using small-mesh demersal trawl gear. Most of the catch consists of *Ammodytes marinus*, but other sandeel species are caught as well. Industrial trawl fisheries targeting sandeels can cause local depletion and alter the age and size composition of the sandeel population. Depletion of the stocks may lead to reduced recruitment and export of larvae to other areas and reduced availability of prey for predators.

Sandeel fisheries in EU waters of the North Sea are managed under the Common Fisheries Policy (based on advice from ICES). The management target is to maintain the biomass within each of the seven management units above the level where impaired recruitment is likely ($B_{\text{escapement}}$) whilst avoiding localised depletion. Fisheries in territorial waters around Shetland are subject to additional national controls which restrict access to smaller vessels and aim to conserve stocks at a level which allows adequate feeding for birds. There is no management to the West of Scotland but targeted fisheries do not currently occur in this area.

At present, Total Allowable Catch (TAC) for all management units relevant to Scottish waters of the North Sea is set at zero (with a catch of only 5000 tonnes permitted for monitoring purposes).

There is little evidence regarding the sensitivity of sandeels to other demersal towed gears. The larger mesh trawl and Seine nets used to catch whitefish and Nephrops do not generally catch sandeels and therefore are not expected to have any direct impact. There is some evidence that Scallop dredges can kill sandeels buried in the sediment (Eleftheriou & Robertson, 1992), but work from Marine Scotland Science has shown that even when equipped with a fine mesh net to sample sandeels, the efficiency is < 12% (MSS, unpubl data) and not therefore considered to pose a significant risk. The sensitivity of sandeels to hydraulic methods is likely to pose the greatest risk of all demersal towed gear used in Scotland based on the extent to which they penetrate/disturb the sediment.

Demersal static gears

Sandeels are not caught by static gears and the impact of these gears is therefore considered to be minimal.

JNCC/SNH advice

Targeted sandeel trawl fisheries – At present, the TAC for sandeels in Sandeel Area 4 is set at a low level to allow monitoring of stock recovery. When stocks recover sufficiently for a greater TAC to be set, fisheries in MPAs should be managed to ensure that local depletion does not occur and prey availability for predators is sufficient to maintain healthy populations. This implies that additional restrictions on catch or effort may be required within MPAs.

Hydraulic dredging – measures to reduce or limit the pressures associated with hydraulic fishing gear would reduce, but not eliminate the risk to the conservation objectives. If the pressures are removed or avoided, the risk would be reduced to the lowest possible level.

Other demersal towed and static gear - Other demersal trawl and seines and demersal static gears are not considered to have a significant impact on sandeel populations and are therefore not expected to require additional management.

Confidence in advice

Targeted sandeel trawl fisheries – high confidence; the conclusions are supported by direct evidence.

Hydraulic dredging – low confidence; the conclusions are supported by expert judgement from fisheries advisors in SNCBs.

Demersal towed and static gear – medium confidence; the conclusions are supported by direct evidence. There is uncertainty over the possible effects of dredging.

Evidence

¹ Wright, 2000, ² Holland <i>et al</i> (2005); ³ MSS unpubl data; ⁴ Jensen et al. 2011 (ICES 2012). Eleftheriou & Robertson 1992; Wright, 2000;							
Directly relevant peer reviewed literature	✓	Directly relevant grey literature	✓	Inference from studies on comparable habitats, gears or geographical areas.		Expert judgement or anecdotal evidence	

Reference

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