

**Scottish MPA Project
Fisheries Management Guidance**

**SHALLOW TIDE-SWEPT COARSE SANDS WITH BURROWING
BIVALVES**

JULY 2013¹

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.

¹ Based on Version 1.2 of the fisheries management guidance

SHALLOW TIDE-SWEPT COARSE SANDS WITH BURROWING BIVALVES

Tide swept coarse and gravelly sands in the shallow subtidal support an abundance of burrowing bivalves, particularly *Tellina* spp and polychaete worms. In some areas, this habitat supports surf clams (*Spisula solida*). Suspension feeding bivalves dominate and are abundant in the coarse sediment. Infaunal species also include polychaete worms, tanaids (shrimp-like crustaceans) and sand hoppers. Bivalves may be preyed upon by starfish, snails and flatfish. This MPA search feature has a very limited distribution with most records from Shetland and a few from Orkney, the west coast of Scotland and Outer Hebrides^{1,2}.

Impacts

All demersal towed gears (including including beam trawl, otter trawl, and scallop dredge)

There is evidence that communities on or in mobile and coarse sands are expected to have higher resilience and recovery to high frequency disturbance^{3,4,5,6}. However, intensive fishing activities such as scallop dredging and hydraulic dredging can modify habitats, slowing down recovery of associated fauna beyond natural capacity^{7,8}. Scallop dredging in sandy habitats has been shown to cause modification of bottom deposits, mortality of fauna and leaving significant amounts of dead organic matter⁹. Sessile long-lived bivalves are among the most severally affected bivalve fauna¹⁰. Even where bivalves remain relatively intact following disturbance by fishing, certain species cannot retract their siphons within the shell. Loss of the siphons is likely to lead to their death¹¹.

The net result of ongoing fishing is the habitat may be maintained in a modified condition with reduced abundance (or possibly loss) of sensitive bivalve and epibenthic species. The degree of modification is likely to be dependent on the intensity of fishing^{12,13} and the gear type, size and weight, as well as depth of penetration into the sediment¹⁴.

All demersal static gears (including gillnets, trammel nets, longlines, pots and traps)

Due to the nature of sandy habitats, demersal static gear tends to have a minimal effect on epifauna^{15,16}. Areas closed to towed demersal fishing yet enabling static gear to continue have shown recovery¹⁷.

JNCC/SNH Advice

Demersal towed gear -. The impact of towed mobile gears can be variable and as a result the appropriate management options will vary from site to site. Determining appropriate management options will require knowledge of fishing activity and intensity in relation to the local features of this habitat (distribution, associated fauna and surface characteristics). Gears that penetrate deeply into the sediment (>5cm) would generally be of more concern than those with only surface impacts (e.g. light trawls, seines).

Demersal static gear - It is not expected that static gears will require any additional management in this habitat.

Confidence in advice

Demersal towed - Medium certainty. There is no direct evidence on shallow tide-swept coarse sands with burrowing bivalves. It has been necessary to make a comparison with other analogous habitats for which evidence exists. It is reasonable to believe that the analogy is justified (eg. occurrence of species with similar characteristics) however the

feature may encompass a number of sub-types which vary in their sensitivity to fishing pressure. The available evidence does not cover the full range of the variation so some cases may not be well supported by evidence.

Demersal static gears - Medium certainty. Conclusions have been based on sensitivity assessments which may rely on significant assumptions or generalisations. It has not been possible to validate these assumptions.

Evidence

¹ Baxter <i>et al.</i> , 2004; ² UK BAP, 2008; ³ MacDonald <i>et al.</i> , 1996; ⁴ Dernie <i>et al.</i> , 2003; ⁵ Hall-Spencer, 1999; ⁶ Hinz <i>et al.</i> , 2011; ⁷ Hauton <i>et al.</i> , 2003; ⁸ Collie <i>et al.</i> , 2001; ⁹ Eleftheriou <i>et al.</i> , 1992; ¹⁰ Kaiser <i>et al.</i> , 2000; ¹¹ Hauton <i>et al.</i> , 2003; ¹² Bergman and Van Santbrink, 2000; ¹³ Kaiser <i>et al.</i> , 2006 ; ¹⁴ MacDonald <i>et al.</i> , 1996; ¹⁵ Hinz <i>et al.</i> , 2011; ¹⁶ Eno <i>et al.</i> , 2001; ¹⁷ Blythe <i>et al.</i> , 2004							
There is no direct evidence for this feature however scientific literature on the effects of burrowing bivalves on coarse sands has been found within Scottish water and from other areas within the the UK.							
Directly relevant peer reviewed literature		Directly relevant grey literature	✓	Inference from studies on comparable habitats, gears or geographical areas.	✓	Expert judgement or anecdotal evidence	✓