

Gear and feature/subfeature combination:	Towed (demersal) – reef [<i>Sabellaria spp.</i> reef]		
Matrix risk category - RED	Explanation for categorisation – The available evidence highlights the impact of towed demersal gears as a significant threat to <i>Sabellaria spp. reef</i> . Although different fishing gears are likely to have variable levels of impact and there is a limited peer reviewed empirical data demonstrating impacts, these factors are not considered to outweigh a precautionary rating of RED particularly in the context of known declines of this feature in the OSPAR region.		
<p>Impacts</p> <p>There are clear links between human activity and threat to <i>S.spinulosa</i> reefs, the most significant of which is physical damage caused by towed demersal trawling (Jones <i>et al.</i> 2000, Holt <i>et al.</i> 1998 and OSPAR, 2010). Marks from otter boards have been clearly observed via sidescan sonar and drop down video during surveys of <i>S. spinulosa</i> on the East and South coast of England (Ian Reach Natural England pers comms 2011). The impact of towed demersal gear is to break apart the worm tubes resulting in direct mortality (death) of the worms and in a reduction of the structure and complexity of the habitat which may no longer support the associated animals and plant communities (UK BAP 2000).</p> <p>One study (Volberg 2000) conducted off the coast of France and in the Wadden Sea challenges the view that all towed gears constitute a great risk to all <i>Sabellaria</i> reef; however, the study findings relate exclusively to short-term effects following once-only disturbance and conclude that the possibility of impairment by shrimp trawling in the medium to long-term cannot be ruled out in the event of intensive fishing, despite the relatively light weight of the gear used.</p>			
<p>Evidence</p> <p>Jones <i>et al.</i> (2000); Holt <i>et al.</i> (1998); UK BAP (2000); Volberg (2000); OSPAR (2010); Hall <i>et al.</i> (1998); Tillin <i>et al.</i> (2010)</p>			
Directly relevant peer reviewed literature	Directly relevant grey literature	Inference from studies on comparable habitats, gears or geographical areas.	Expert judgement
	X	X	X
<p>Confidence - Medium certainty. The conclusions are supported by directly relevant scientific information from a number of different sources. However, this is predominantly grey literature based on expert inference rather than direct peer reviewed empirical evidence of the impacts of fishing gear.</p>			

Gear and feature/subfeature combination:	Towed Dredge (All) – reef [Sabellaria spp. reef]		
Matrix risk category - RED	Explanation for categorisation – The available evidence highlights the impact of towed demersal gears including towed dredges as a significant threat to <i>Sabellaria spp. reef</i> . Although there is limited peer reviewed empirical data demonstrating impacts of dredging on <i>Sabellaria spp. reef</i> , it is considered to be highly vulnerable to the effects of dredging because of the known and directly analogous impacts on the effects of dredging on other highly sensitive biogenic reef features. As such can be reasonably assumed that this gear/habitat combination should be categorised as RED particularly in the context of known declines of this feature in the OSPAR region.		
<p>Impacts</p> <p>There are clear links between human activity and threat to <i>S.spinulosa</i> reefs, the most significant of which is physical damage caused by towed demersal trawling (Jones <i>et al.</i> 2000, Holt <i>et al.</i> 1998 and OSPAR, 2010). Kaiser, 2006 observed that in biogenic habitats the most severe impact occurred in response to scallop-dredging.</p> <p>The impact of towed demersal gear is to break apart the worm tubes resulting in direct mortality (death) of the worms and in a reduction of the structure and complexity of the habitat which may no longer support the associated animals and plant communities (UK BAP 2000).</p>			
<p>Evidence</p> <p>Jones <i>et al.</i> (2000); Holt <i>et al.</i> (1998); UK BAP (2000); Volberg (2000); OSPAR (2010); Hall <i>et al.</i> (1998); Tillin <i>et al.</i> (2010)</p>			
Directly relevant peer reviewed literature	Directly relevant grey literature	Inference from studies on comparable habitats, gears or geographical areas.	Expert judgement
X	X	X	X
<p>Confidence – High/Medium certainty. The conclusions have been inferred from the effects of dredge gears on other types of highly sensitive biogenic reef, these studies are considered to be directly applicable. These are also supported by directly relevant scientific information from a number of different sources. However, this is predominantly grey literature based on expert inference rather than direct peer reviewed empirical evidence of the impacts of fishing gear.</p>			

Gear and feature/subfeature combination:	Dredge [other] – reef [Sabellaria spp. reef]
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Matrix risk category - RED		<p>Explanation for categorisation – this gear and feature combination is considered unlikely to occur, however although direct evidence is not available, if an interaction did occur the impact is considered to be comparable to the effects of Towed [dredge].</p> <p>Therefore a rating of RED particularly in the context of declines of this feature in the OSPAR region.</p>	
Impacts			
<p><i>Sabellaria spinulosa</i> reefs are generally found in the sub-tidal zone, therefore there is unlikely to be an interaction between these gear categories (<i>Dredges [other]</i> and <i>Bait Collection [Bait Digging]</i> and <i>[Bait Dragging]</i>). However if an interaction were to occur (for example when fishing in very low spring tides) the fishery would be very likely to cause pressures similar to those outlined in the Matrix Assessment for <i>Towed [Demersal]</i> and <i>Towed [Dredge]</i> fishing gears as outlined above.</p>			
Evidence			
Jones <i>et al.</i> (2000); Holt <i>et al.</i> (1998); UK BAP (2000); Hall <i>et al.</i> (1998); Kaiser <i>et al.</i> 2006			
Directly relevant peer reviewed literature	Directly relevant grey literature	Inference from studies on comparable habitats, gears or geographical areas.	Expert judgement
		X	X
<p>Confidence – Medium certainty. The conclusions have been inferred from the effects of dredge gears on other types of highly sensitive biogenic reef, these studies are considered to be directly applicable.</p> <p>The conclusions are supported by directly relevant scientific information from a number of different sources. However, this is predominantly grey literature based on expert inference rather than direct peer reviewed empirical evidence of the impacts of fishing gear.</p>			

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