



Marine
Management
Organisation

Stage 4 Fishing Gear MPA Impacts Evidence: Summary



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This summary report provides a concise overview of the Marine Management Organisation (MMO) analysis of the impacts of fishing on features of Stage 4 marine protected areas (MPAs) in England. The Stage 4 features are harbour porpoise and marine birds. The sources of evidence, procedures and rationale used in each of these analyses are outlined in the respective full reports, which are available here:

[Marine protected areas - Stage 4 impacts evidence - GOV.UK](#)

1 Key definitions

Traps are stationary structures of many shapes and sizes into which fish and shellfish are drawn by bait or other attractants. Pots and creels are included within this definition of traps.

Nets include gillnets, which are curtains of fine netting hung in the water with specific types including trammel, tangle and drift nets.

Lines include gear where fish are attracted to bait placed on hooks on lines, such as longlining, jigging and trolling.

Bottom towed fishing gear means any trawls, seines, dredges or similar gear, including trawls towed on or very close to the seabed, which are actively moved in the water by one or more fishing vessels or by any other mechanised system and in which any part of the gear is designed and rigged to operate on, and be in contact with, the seabed.

Midwater gear includes midwater towed gear where trawls are towed in the water column, and purse seines which are large nets shot in a circle to surround shoals of fish.

Designated features ('features') are habitats or species found within a marine protected area (MPA) and for which the area has been designated to protect. The '**sensitivity**' of a feature (species or habitat) is a measure that is dependent not only on the ability of the feature to resist change, but also its ability to recover. A very sensitive habitat or species is one that is very easily impacted by a pressure and/or is expected to recover over a very long period or not at all.

Pressure is the mechanism through which an activity impacts any part of the ecosystem. The nature of the pressure is determined by activity type, intensity and distribution.

An **impact** is the consequence of pressures (for example death or injury of harbour porpoise/ marine birds) where a change occurs that is different to that expected under natural conditions.

2 Key findings

Tables 1 and 2 summarise the outcomes and management considerations of MMO analysis for harbour porpoise and marine birds respectively. There is also a summary of the causes of variation in impact to be considered when conducting site assessments.

Site level assessments will be undertaken for fishing in each MPA considered in Stage 4. Site level assessments will consider the evidence analysed in the Stage 4 Fishing Gear MPA Impacts Evidence documents alongside site specific details, including:

- the conservation objectives of the MPA,
- the intensity and nature of fishing activity,
- the environmental conditions of the site,
- the ecological characteristics of the designated feature and supporting habitats.

Management measures for each MPA will be developed based on the outcome of the site level assessments.

Table 1. Summary of MMO analysis of evidence on fishing impacts on harbour porpoise.

Gear type	Potential pressures	Evidence considerations	Variation in impacts
Bottom towed gear	Bycatch	<p>Harbour porpoise ecology</p> <ul style="list-style-type: none"> Limited knowledge of harbour porpoise abundance and distribution, including seasonal variations and life history. <p>Harbour porpoise bycatch</p> <ul style="list-style-type: none"> Limited data on bycatch from bottom towed gear, lines and traps as monitoring focuses on static nets and midwater trawls. Some bycatch may not be observed as animals drop out of fishing gear. Assumptions and limitations linked to estimating population-level effects of harbour porpoise bycatch. <p>Removal of target and non-target prey species</p> <ul style="list-style-type: none"> Limited information on the link between harbour porpoise diet and the removal of prey by fishing. Difficulty determining the impact of prey removal on harbour porpoise population. <p>Impacts of fishing vessel presence</p>	<p>All pressures</p> <ul style="list-style-type: none"> Level of fishing intensity The occurrence of fishing activity in relation to abundance and distribution of harbour porpoise Harbour porpoise foraging and life history parameters Seasonal movements of harbour porpoise Presence of calves and juveniles External factors such as fish stocks and impacts of non-fishing activities <p>Harbour porpoise bycatch impacts</p> <ul style="list-style-type: none"> Fishing effort and target fishery Spatial and temporal overlap of the fishery relative to harbour porpoise Harbour porpoise population size Variation between gear types Type of net and factors such as net density, soak time and net length Use of acoustic deterrent devices (ADD) <p>Impacts to supporting habitats</p> <ul style="list-style-type: none"> History of prior fishing Gear type
	Removal of target and non-target prey species		
	Physical loss or damage to supporting habitats		
Nets	Bycatch	<p>Removal of target and non-target prey species</p> <ul style="list-style-type: none"> Some bycatch may not be observed as animals drop out of fishing gear. Assumptions and limitations linked to estimating population-level effects of harbour porpoise bycatch. 	
	Removal of target and non-target prey species		
Lines	Bycatch	<p>Removal of target and non-target prey species</p> <ul style="list-style-type: none"> Limited information on the link between harbour porpoise diet and the removal of prey by fishing. Difficulty determining the impact of prey removal on harbour porpoise population. 	
	Removal of target and non-target prey species		
Traps	Bycatch	<p>Removal of target and non-target prey species</p> <ul style="list-style-type: none"> Limited information on the link between harbour porpoise diet and the removal of prey by fishing. Difficulty determining the impact of prey removal on harbour porpoise population. 	
	Removal of target and non-target prey species;		
Midwater gear	Bycatch	<p>Removal of target and non-target prey species</p> <ul style="list-style-type: none"> Limited information on the link between harbour porpoise diet and the removal of prey by fishing. Difficulty determining the impact of prey removal on harbour porpoise population. 	
	Removal of target and non-target prey species		

Gear type	Potential pressures	Evidence considerations	Variation in impacts
Fishing vessel presence	Underwater (anthropogenic) noise	<ul style="list-style-type: none"> • Difficult separating impacts from commercial fishing vessels from non-fishing vessels and activities, for example, related to vessel strikes and underwater noise. • Limited data on presence of under 12 m fishing vessels. 	<ul style="list-style-type: none"> • Habitat type Vessel presence impacts <ul style="list-style-type: none"> • Nature, scale and duration of fishing activity • Type, size and speed of vessel as well as type of vessel movement • Geography and seabed topography • Energetic demands of harbour porpoise individuals • Habituation – decrease in response to a stimulus after being repeatedly exposed to it • Spatial and temporal overlap of vessels relative to harbour porpoise • External factors such as non-fishing activities
	Death/injury by collision		
	Visual disturbance		
	Contamination		
	Litter		

Table 2. Summary of MMO analysis of evidence on fishing impacts on marine birds.

Green underlined = species of concern. Black = other species which may require assessment

Activity	Potential pressures	Marine bird species	Evidence considerations	Variation in impacts
Bottom towed gear	Marine bird bycatch	Common tern, little tern, Sandwich tern, red-throated diver, common scoter, little gull	<p>Marine bird bycatch</p> <ul style="list-style-type: none"> • Marine bycatch is difficult to estimate as carcasses are often lost at sea or scavenged. • Minimal literature for marine bird bycatch impacts from demersal seines, traps, nets, lines, midwater trawls and purse seines. • Potential for studies to under report bycatch where observation is limited, for example, on larger midwater trawling vessels due to vessels pumping catch straight into storage tanks. <p>Removal of target and non-target prey species</p> <ul style="list-style-type: none"> • Limited literature on impacts of bottom towed gear, traps, midwater gear on prey 	<p>All pressures</p> <ul style="list-style-type: none"> • Level of fishing intensity • Regional differences in species targeted by fishing gear. • The ability of marine bird species to adapt to changes in prey availability. • The occurrence of fishing activity in relation to distribution of marine birds and location of feeding grounds. <p>Marine bird bycatch impacts</p> <ul style="list-style-type: none"> • Age and breeding behaviour of marine bird species. • The use of methods aiming to reduce bycatch in fisheries. • Attraction of marine birds to foraging opportunities created by fishing. • Gear configuration such as net mesh size, number of hooks, setting depth and soak time. • Bait type.
	Removal of target and non-target prey species	<u>Common tern, Sandwich tern, little tern, common scoter</u> Red-throated diver, little gull		
	Changes in water clarity	<u>Common tern, little tern, Sandwich tern, red-throated diver</u> Little gull, common scoter		
	Physical loss, change or damage to supporting habitats	<u>Common tern, little tern, Sandwich tern</u> Red-throated diver, common scoter, little gull		
Midwater gear	Marine bird bycatch	Common tern, little tern, Sandwich tern, red-throated diver, common scoter, little gull		

Activity	Potential pressures	Marine bird species	Evidence considerations	Variation in impacts
	Removal of target and non-target prey species	<u>Common tern, Sandwich tern, little tern</u> Red-throated diver, little gull, common scoter	availability and resulting impacts on marine birds. Impacts on supporting habitats	<ul style="list-style-type: none"> Weather conditions, water clarity time of day and season when gear is set. Prey availability impacts <ul style="list-style-type: none"> Season (breeding vs non-breeding).
Anchored nets and lines	Marine bird bycatch	<u>Red-throated diver, common scoter</u> Common tern, little tern, Sandwich tern, little gull	Impacts of fishing vessel presence <ul style="list-style-type: none"> Limited literature on the impact of bottom towed gear and traps on marine bird supporting habitats. Evidence for impact on habitats often not linked to resulting impact on birds. Literature is often focussed on vessel presence impacts in relation to shipping, transportation and windfarm traffic. Limited literature related to fishing. Limited literature on long-term disturbance effects on marine birds, individually and at a population level. 	Impact changes in suspended solids <ul style="list-style-type: none"> Natural background turbidity levels. Non-physical disturbance impacts <ul style="list-style-type: none"> Nature, scale and duration of fishing activity. Type, size and speed of vessel. Differences in marine bird wing morphology. Marine bird flock size, location, sea state and moulting stage. Tide height. Habituation – decrease in response to a stimulus after being repeatedly exposed to it.
	Removal of target and non-target prey species	Common tern, Sandwich tern, little tern, common scoter, red-throated diver, little gull		
	Physical loss, change or damage to supporting habitats	Common tern, little tern, Sandwich tern, red-throated diver, common scoter, little gull		
Traps	Marine bird bycatch	Common tern, little tern, Sandwich tern, red-throated diver, common scoter, little gull		

Activity	Potential pressures	Marine bird species	Evidence considerations	Variation in impacts
	Removal of target and non-target prey species	Common tern, Sandwich tern, little tern, common scoter, red-throated diver, little gull	<ul style="list-style-type: none"> Literature often does not split disturbance impacts into noise and visual. Limited information is available regarding noise disturbance and variation in vessel speed. 	<ul style="list-style-type: none"> Season (breeding vs non-breeding).
	Physical loss, change or damage to supporting habitats	Common tern, little tern, Sandwich tern, red-throated diver, common scoter, little gull		
Fishing vessel presence	Non-physical disturbance (covers visual disturbance, above water noise and underwater noise changes)	<u>Red-throated diver, common scoter</u> Common tern, little tern, Sandwich tern, little gull		
	Collision above/below water with static or moving objects not naturally found in the marine environment	<u>Common tern, little tern, Sandwich tern, red-throated diver, common scoter, little gull</u>		