C7488: Project UK Fisheries Improvements: Task 3.

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Executive Summary

This document presents a review of potential detrimental interactions between Endangered Threatened or Protected species (ETP) and crab/lobster static fishing gear. Species were assessed based on their categorisation under the IUCN Red List combined with their inclusion in the UK Biodiversity Action Plan (BAP Species). The identified ETP species were then assessed in terms of their potential to detrimentally interact with crab/lobster static fishing gear, and finally mitigation measures were suggested that may help address these interactions should they exist.

Three areas of concern were identified as:

1. Entanglement in crab/lobster vertical lines by sea turtles, cetaceans and pelagic sharks
2. Direct damage through crab/lobster pot contact with fragile coralline species
3. Incidental bycatch or ghost fishing of motile invertebrates

Within these three areas, species of concern were identified as:

1. Visiting or resident ETP species of sea turtle, marine mammal and shark
2. The cup coral species *Leptopsammia pruvoti* and *Caryophyllia smithii*
3. The European Spiny Lobster

Recommended mitigation measures within these three areas are:

1. Sinking the excess or otherwise reducing the amount of unused vertical line slack; or increasing the number of pots per string to reduce number of buoyed vertical lines. These measures are no more than general best practice and should only be considered interim mitigation until other methods have been further developed and their efficacy tested. To aid this longer-term goal, and to help fill the knowledge gap on this subject, it is suggested that an official, centralised reporting scheme is established to fully document cases of entanglement by ETP species in all fishing gear types
2. The continued use of current marine area conservation classifications, with consideration given to creating more that also serve as no-take zones
3. Regular fisheries legislation and best practice guidelines should be followed for this bycatch species (that has its own targeted fishery) and should include the use of biodegradable hatches to restrict ghost fishing should gear be lost at sea

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# Introduction

This report reviews the species classed as Endangered, Threatened and Protected (ETP) in Southwestern waters (within fishing sub areas VIId-VIIh) and assesses their potential interactions with crab/lobster pots (including the vertical line, pot and the pots’ interaction with the seabed), and if deemed detrimental, suggests mitigation measures that may be considered to alleviate the risk of occurrence or damage incurred. Only exclusively marine animals have been considered, thus species such as the Atlantic Puffin, Eurasian Otter or Harbour Seal did not form part of this review. Likewise, deep water species were not considered as they are unlikely to encounter crab/lobster pot fishing gear. To warrant inclusion, a species must have been classified within the International Union for the Conservation of Nature (IUCN) Red List as Vulnerable, Endangered or Critically Endangered (IUCN, 2017), or identified as being threatened and requiring conservation action under the UK Biodiversity Action Plan (BAP Species) following the 2007 species list review (JNCC, 2016). This ‘either-or’ methodology was chosen so to create the most comprehensive list possible. Once a species list had been established (see Appendix 1) each was assessed individually, and a literature review conducted to ascertain the likelihood and outcome of any potential interaction with the fishing gear, whether either primary or secondary[[1]](#footnote-1) in nature. Finally, potential mitigation measures are suggested, and general recommendations made.

# Marine Turtles

The National Marine Fisheries Service in the United States of America has 138 recorded entanglements of marine turtles, that primarily consisted of Leatherbacks with fishing pot vertical lines in their northeast region. Eighty-one of these were confirmed as belonging to lobster pots (NOAA, 2015). Hamelin *et al*., (2017) examined incidental capture of Leatherback Turtles in fixed fishing gear off Atlantic Canada and found that entanglements were most commonly reported in pot gear and trap nets, and suggests that mitigation measures are needed to reduce associated turtle mortality.

Of all species of sea turtle, Leatherbacks are the most likely to be found in southwestern UK waters as it can regulate its body temperature and thus visit temperate waters. Multiple sightings are typically reported each year although there is not a verified database for recording such events. The Loggerhead Turtle is also reported as an occasional visitor, and the Marine Conservation Society also reports Green Turtles, Hawksbill Turtles, and Kemps Ridley Turtles as rare visitors to UK waters (MCS, 2011). However, for the scope of this report it is only Leatherbacks that are considered to have a notable probability of detrimental interaction, with Loggerheads in need of consideration but unlikely to be impacted.

Reports of entanglement of turtles in fishing gear are few and anecdotal. A leatherback was reportedly photographed in 2017 freeing itself from a rope and buoy but it is not clear if this was a pot marker or a mooring point.

# Marine Mammals

The entanglement of Humpback Whales has been identified as an emerging issue in UK pot fisheries (Ryan, 2016), especially following the well-publicised incident off the coast of Devon in 2017 (BBC, 2017). It is unclear how this risk may translate to other species of marine mammals, but there is an entanglement potential for all those visiting UK waters, albeit dependant on their individual habitat choices and behaviour.

A recent extensive compilation study on the waters around New Zealand found that on average 1.4 whale entanglements were reported each year, and that 64% of these were entangled in lobster pot vertical lines (Laverick *et al*., 2017). Within this New Zealand study, the species entangled included (but were not limited to); Humpback Whale, Killer Whale, Southern Right Whale, Minke Whale, and Blue Whale.

In the UK, all species of whale that visit are covered under the BAP listing (see Appendix 1), although based on IUCN classification only four species are considered ‘threatened’. These are the Blue Whale, Fin Whale, Sei Whale and Sperm Whale.

Reports of marine mammals interacting with static fishing gear are relatively rare and there is no official or centralised reporting scheme. Records are therefore either gleaned from local press or the logs of marine interest groups. Fishers are encouraged to set gear responsibly and to contact British Divers Marine Life Rescue when an entanglement occurs.

# Sharks, Skates and Rays

In terms of the species that live or feed on or near the sea floor within this group (all skates, most rays and some sharks) a review was conducted to ascertain whether any detrimental interaction may happen between the species and the pot itself. No cases of such interactions were found, although it is recognised that there is a slight possibility of secondary interactions should pot fishing one day cause detriment to the overall habitat health of an area. However, based on findings by Walmsley *et al*., (2015) and Stephenson (2016) it is unlikely at this time that such an effect will take place, even if fishing intensity increases.

In a similar way to the marine mammals, the pelagic members of the group may be at risk from entanglement with crab/lobster pot vertical lines. Of immediate concern are seven species that are either considered ‘threatened’ by the IUCN or are covered under the BAP listing (see Appendix 1). These are the Basking Shark, Blue Shark, Porbeagle Shark, Shortfin Mako Shark, Smooth Hammerhead Shark, Thresher Shark and Tope Shark. Again though, as with the marine mammals, this risk is dependant upon their individual habitat choices and behaviour.

However, no reports of shark entanglements with crab/lobster pot vertical lines were found, but if they do occur are thought to be rare. As with other marine species groups, there is no official or centralised reporting scheme.

# Bony Fishes

After review, it has been concluded that it is unlikely that bony fishes will interact detrimentally with crab/lobster fishing gear, aside from a small amount of incidental bycatch of species living on or near the sea floor. No references were found citing detrimental impacts, aside from mention of both Long and Short Snouted Seahorses potentially attaching themselves to pot wire mesh and being subsequently hauled to the surface. The British Seahorse Survey for example (Garrick-Maidment, 2004), found that of the total numbers of seahorses sighted between 1821 and 2004, 15% were on ‘unnatural objects’ such as lobster pots and mooring lines. The report also states that both species have been found on crab/lobster pots throughout the British Isles. There is no available data on mortality rates of seahorses hauled by fishers inadvertently, but it is likely to be low if the individual is returned quickly to the water, rather than falling off unnoticed into the hull of the fishing vessel.

# Invertebrates – Sessile Benthic Flora and Fauna

Damage to sessile benthic flora and fauna caused by contact from fish or crab/lobster pots is relatively well documented in fragile coral reef habitats (Sheridan *et al*., 2005). However, in waters not dominated by brittle coralline species this damage is much less prevalent and/or not extensively documented. A review conducted by Jennings & Kaiser (1998) found that although pots that landed on or were hauled through beds of the non-ETP foliose bryozoan *Pentapora foliacea* caused physical damage, sea pens (for example the BAP species *Funiculina quadrangularis*) remained undamaged and bent in response to the pressure wave created by the descending pot and lay flat on the seabed. If uprooted, the sea pens were also able to later re-establish themselves in the sediment. Another review by Gubbay & Knapman (1999) also only concludes that damage is caused to species such as *P. foliacea*, and Eno *et al*., (1996) found that sea fans (for example the IUCN listed ‘vulnerable’ and BAP species *Eunicella verrucosa*) were more flexible than anticipated and were not severely damaged when pots were hauled over them. Eno *et al*., (1996) goes on to conclude that the direct contact of fishing gear with fauna may not be a primary cause of mortality, and that the frequency and intensity of physical contact is more likely to be important, Stephenson (2016) suggested that even high intensity regimes may not exhibit an effect when he wrote: “The high experimental fishing intensity, in small experimental areas, coupled with high levels of sampling and replication, provided robust evidence that current levels of potting are unlikely to have a direct physical impact on [sea floor species]”. The exception to this in terms of brittle coralline species are two corals classified under BAP; the Sunset Cup Coral and the Devon Cup Coral. The Sunset Cup Coral grows independently of sunlight and so is often found under rocks or overhangs, usually protected from any potential damage by crab/lobster pots. However, of the two species, even though damage is most likely to occur to the Devon Cup Coral*,* consideration should still be given to both species due to their BAP classification.

Similarly, studies into the impact of demersal static fishing gear on maerl beds found no direct evidence of damage, although they speculated that unregulated and higher intensity fishing effort could have damaging effects in the future (JNCC 2013). An earlier report by the JNCC (2008) cites scallop dredging as the biggest threat to maerl beds but makes no mention of damage by demersal static fishing gear.

# Invertebrates – Motile Fauna

Of the ETP motile fauna likely to be detrimentally impacted by crab/lobster pot fishing, only the European Spiny Lobster was found in need of consideration. Although classified by the IUCN as Vulnerable and listed as a BAP species, the European Spiny Lobster has its own fishery. With a range from the central Mediterranean to as far north as Norway, it has been exploited for many decades using pots and/or trammel nets, with numbers in general across their range declining due to this exploitation (Goni & Latrouite, 2005). In the UK a 95 mm minimum carapace length exists to protect the immature portion of the population, together with the protection of berried (egg-bearing) females or those that have been visibly v-notched. Incidental catch of this species through crab or other lobster pot fisheries should be treated as regular targeted catch would be within its own fishery. The Goni & Latrouite (2005) review goes on to suggest certain pots types can exclude larger size classes which may benefit potential bycatch species groups. It should also be noted that potential ghost fishing may also influence this species within other crab/lobster fishery areas.

# Mitigation and Recommendations

Based on the previous sections, there are several mitigation measures recommended to minimise the chances of ETP species detrimentally interacting with crab/lobster pot fishing gear. These are grouped into three concern areas below.

*Entanglement*

Laverick *et al*., (2017) provides a concise review of potential mitigation measures for whale entanglements, which can be used also to address the two other marine species groups: Using reduced strength vertical lines; varying the colours of vertical lines; and using rope-less fishing techniques were all suggested, although all were concluded to be too costly to allow their use or in need of study to assess their effectiveness. For example, weak links have been used in the United States since 1997 for all buoys used while setting lobster pots (break limits of 272.4 kg in inshore areas, 680.4 kg in offshore areas). After years of implementation however the use of these weak links did not appear to reduce the incidence or severity of entanglements (Knowlton *et al*., 2015).

In terms of migratory species, temporal or spatial restrictions to fisheries areas have been suggested to avoid migration seasons or migration routes. However, when NOAA introduced their Atlantic Large Whale Take Reduction Plan (which also explored the use of weak links), they found it appeared ineffective and with great cost to fisheries (Moore, 2009).

The use of acoustic pingers, which have proven somewhat successful in reducing trammel net entanglements with dolphins, is another method with mitigation potential. However, when this was tested by Harcourt (2014) with migrating Humpback Whales it failed to deter individuals from their route.

Thus, the suggested recommendations for crab/lobster pot fishing gear use that may reduce entanglements are limited to: the sinking the excess or otherwise reducing the amount of unused vertical line slack; or increasing the number of pots per string to reduce number of buoyed vertical lines. Such measures are considered general best practice although it should only be considered as interim mitigation until other methods have been further developed and their efficacy tested.

To work towards the long-term goal of mitigation measure development, and to further aid our understanding on the subject of entanglement while continuing to build upon the current knowledge base, it is recommended that an official, centralised reporting scheme to document cases of entanglement by ETP species in all fishing gear types. This scheme could be built around a centrally managed cloud-based data archive system that multiple agencies could enter information in to. Records of entanglements would be designed to provide details of location, species entangled, mortality and/or physical damage to species, gear type, and other general notes/observations.

*Pot contact*

The only tangible mitigation method against damage caused by pot contact with fragile organisms (in this case the cup corals *Leptopsammia pruvoti* and *Caryophyllia smithii*) is to designate protected areas where pot fishing is not permitted. Marine Conservation Zones (MCZ) or Special Areas of Conservation (SAC), such as that created at Lundy Island (which is also a designated no-take zone), offer such refuges and will help protect these fragile species of coral. It is recommended, that dependant on their purpose, and due to often special conditions that exist in the southwestern region of UK waters, consideration be given to more MCZs or SACs becoming no-take zones.

*Bycatch from pots*

The only species that falls into this category is the European Spiny Lobster, and as it is itself a fishery species, it is recommended that any incidental bycatch from crab or other lobster fisheries follow regular fisheries legislation and best practice: small or berried individuals should be returned to the water unharmed; escape slits in place to allow immature individuals to escape; and biodegradable hatches used to allow any size of individual to escape should the surface buoy be lost and ghost fishing take place.

# References

BBC (2017). Online resource found at: <http://www.bbc.co.uk/news/uk-england-devon-39471727>

Eno N.C., MacDonald D. and Amos S.C. (1996). A study on the effects of fish (Crustacea/Mollusc) traps on benthic habitats and species. Report to European Commission Directorate General XIV, Studies Contract 94/076. 43 pages.

Garrick-Maidment N. (2004). British Seahorse Survey Report. Produced for The Seahorse Trust, Topsham, Devon, UK. <https://www.theseahorsetrust.org/userfiles/PDF/BSS%202004%20Report.pdf>

Goñia R & Latrouite D. (2005). Review of the biology, ecology and fisheries of *Palinurus spp*. Species of European waters; *Palinurus elephas* and *Palinurus mauritanicus*. *Cahiers de Biologie Marine* **46**. P. 127-142.

Gubbay S. & Knapman P.A. (1999). A review of the effects of fishing within UK European marine sites. English Nature (UK Marine SACs Project). 134 pages.

Hamelin K.M., James M.C., Ledwell W., Huntington J. & Martin K. (2017). Incidental capture of leatherback sea turtles in fixed fishing gear off Atlantic Canada. *Aquatic Conservation Marine and Freshwater Ecosystems* **27**. P. 631-642.

Harcourt R., Pirotta V., Heller G., Peddemors V. & Slip D. (2014). A whale alarm fails to deter migrating humpback whales: an empirical test. *Endangered Species Research* *25*. P. 35-42.

IUCN (2017). Online resource found at: <http://www.iucnredlist.org/about/overview>

Jennings S. & Kaiser M.J. (1998). The effects of fishing on marine ecosystems. *Advances in Marine Biology* **34**. P. 201-212.

JNCC (2008). Online Resource found at: <http://jncc.defra.gov.uk/pdf/UKBAP_BAPHabitats-33-MaerlBeds.pdf>

JNCC (2013). Online resource found at: <http://jncc.defra.gov.uk/pdf/SMPA_fisheries_management_guidance_maerl_beds_July2013.pdf>

JNCC (2016). Online resource found at: <http://jncc.defra.gov.uk/page-5167>

Knowlton A.R., Robbins J., Landry S., McKenna H.A., Kraus S.D. & Werner T.B. (2015). Effects of fishing rope strength on the severity of large whale entanglements. *Conservation Biology* **30**. P. 318-328.

Laverick S., Douglas L., Childerhouse S. & Burns D. (2017). Entanglement of cetaceans in pot/trap lines and set nets and a review of potential mitigation methods. Final report for the MIT2016-02 New Zealand entanglement mitigation review <http://www.doc.govt.nz/our-work/conservation-services-programme/csp-reports/2016-17/entanglement-of-cetaceans-in-pot-trap-lines-and-set-nets-and-a-review-of-potential-mitigation-methods/>

MCS (2011). Online resource found at: <https://www.mcsuk.org/downloads/wildlife/turtlecode.pdf>

Moore M.J. (2009). Current Issues Facing North Atlantic Right Whales and Stakeholders. *Boston College Environmental Affairs Law Review* **36**. P. 308-317.

NOAA (2015). Sea turtle and vertical lines in the Northeast [US] region issue statement and research needs.<https://www.greateratlantic.fisheries.noaa.gov/protected/seaturtles/docs/vertical_line_summary_final.pdf>

Sheridan P., Hill R., Matthews G., Appeldoorn R., Kojis B. & Matthews T. (2005). Does trap fishing impact coral reef ecosystems. *56th Gulf and Caribbean Fisheries Institute* **56**. P. 511-519.

Stephenson F. (2016). Shellfisheries, seabed habitats and interactions in Northumberland. PhD thesis for Newcastle University School of Marine Science and Technology, United Kingdom. 253 pages.

Walmsley S.F., Bowles A., Eno N.C. & West N. (2015). Evidence for management of potting impacts on designated features. Report prepared by AMP Marine Environmental Research Ltd, Eno Consulting and Centre for Environment, Fisheries and Aquatic Science for the Department of Environment Food and Rural Affairs, Marine and Fisheries Science Unit, London, United Kingdom. <http://randd.defra.gov.uk/Document.aspx?Document=12953_MMO1086-PottingImpactsStudy-FINAL.pdf>

# Appendix

List of ETP species reviewed for this report (IUCN Red List categorisation as Vulnerable, Endangered or Critically Endangered, and/or identified as being threatened and requiring conservation action under the UK Biodiversity Action Plan).

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| --- | --- | --- | --- | --- | --- |
| Turtles Species | *Scientific Name* | Potential Interaction | IUCN Red List Class | Concern in the UK | Concern? |
| Leatherback Turtle | *Dermochelys coriacea* | Entanglement | Vulnerable | BAP Species | YES |
| Loggerhead Turtle | *Caretta caretta* | Entanglement | Vulnerable | BAP Species | YES |
| Cetaceans Species | *Scientific Name* | Potential Interaction | IUCN Red List Class | Concern in the UK | Concern? |
| Humpback Whale | *Megaptera novaeangliae* | Entanglement | Least Concern | BAP Species | YES |
| Blue Whale | *Balaenoptera musculus* | Entanglement | Endangered | BAP Species | YES |
| Fin Whale | *Balaenoptera physalus* | Entanglement | Endangered | BAP Species | YES |
| Sei Whale | *Balaenoptera borealis* | Entanglement | Endangered | BAP Species | YES |
| Minke Whale | *Balaenoptera acutorostrata* | Entanglement | Least Concern | BAP Species | YES |
| Sperm Whale | *Physeter macrocephalus* | Entanglement | Vulnerable | BAP Species | YES |
| Northern Right Whale | *Eubalaena glacialis* | Entanglement | Not yet assessed | BAP Species | YES |
| Northern Bottlenose Whale | *Hyperodon ampullatus* | Entanglement | Not yet assessed | BAP Species | YES |
| Killer Whale | *Orcinus orca* | Entanglement | Data Deficient | BAP Species | YES |
| Long-finned Pilot Whale | *Globicephala melas* | Entanglement | Data Deficient | BAP Species | YES |
| Sowerbys Beaked Whale | *Mesoplodon bidens* | Entanglement | Data Deficient | BAP Species | YES |
| Trues Beaked Whale | *Mesoplodon mirus* | Entanglement | Data Deficient | BAP Species | YES |
| Cuviers Beaked Whale | *Ziphius cavirostris* | Entanglement | Least Concern | BAP Species | YES |
| Rissos Dolphin | *Grampus griseus* | Entanglement | Least Concern | BAP Species | YES |
| Atlantic White-sided Dolphin | *Lagenorhynchus acutus* | Entanglement | Least Concern | BAP Species | YES |
| White Beaked Dolphin | *Lagenorhynchus albirostris* | Entanglement | Least Concern | BAP Species | YES |
| Common Dolphin | *Delphinus delphis* | Entanglement | Least Concern | BAP Species | YES |
| Striped Dolphin | *Stenella coeruleoalba* | Entanglement | Least Concern | BAP Species | YES |
| Bottlenose Dolphin | *Tursiops truncatus* | Entanglement | Least Concern | BAP Species | YES |
| Harbour Porpoise | *Phoocoena phocoena* | Entanglement | Least Concern | BAP Speices | YES |
| Sharks Skates & Ray Species | *Scientific Name* | Potential Interaction | IUCN Red List Class | Concern in the UK | Concern? |
| Common Skate | *Dipturus batis* | Habitat interaction | Critically Endangered | BAP Species | NO |
| Shagreen Ray | *Leucoraja fullonica* | Habitat interaction | Vulnerable | Not BAP Species | NO |
| Undulate Ray | *Raja undulata* | Habitat interaction | Endangered | BAP Species | NO |
| White Skate | *Rostroraja alba* | Habitat interaction | Endangered | BAP Species | NO |
| Angelshark | *Squatina squatina* | Habitat interaction | Critically Endangered | BAP Species | NO |
| Basking Shark | *Cetorhinus maximus* | Entanglement | Vulnerable | BAP Species | YES |
| Blue Shark | *Prionace glauca* | Entanglement | Near Threatened | BAP Species | YES |
| Porbeagle Shark | *Lamna nasus* | Entanglement | Not yet assessed | BAP Species | YES |
| Shortfin Mako Shark | *Isurus oxyrinchus* | Entanglement | Vulnerable | BAP Species | YES |
| Smooth Hammerhead | *Sphyrna zygaena* | Entanglement | Vulnerable | Not BAP Species | YES |
| Spiny Dogfish | *Squalus acanthias* | Habitat interaction | Vulnerable | BAP Species | NO |
| Thresher Shark | *Alopias vulpinus* | Entanglement | Vulnerable | Not BAP Species | YES |
| Tope Shark | *Galeorhinus galeus* | Entanglement | Vulnerable | BAP Species | YES |
| Ray-finned Fish Species | *Scientific Name* | Potential Interaction | IUCN Red List Class | Concern in the UK | Concern? |
| Bluefin Tuna | *Thunnus thynnus* | None suspected | Endangered | BAP Species | NO |
| Short snouted seahorse | *Hippocampus hippocampus* | May attach to traps | Data Deficient | BAP Species | NO |
| Long snouted seahorse | *Hippocampus guttulatus* | May attach to traps | Data Deficient | BAP Species | NO |
| Plaice | *Pleuronectes platessa* | Habitat interaction | Least Concern | BAP Species | NO |
| Sole | *Solea solea* | Habitat interaction | Data Deficient | BAP Species | NO |
| Raitts sand eel | *Ammodytes marinus* | Habitat interaction | Not yet assessed | BAP Species | NO |
| Atlantic Cod | *Gadus morhua* | Habitat interaction | Vulnerable | BAP Species | NO |
| Herring | *Clupea harengus* | None suspected | Least Concern | BAP Species | NO |
| Atlantic Halibut | *Hippoglossus hippoglossus* | Habitat interaction | Endangered | BAP Species | NO |
| Sea Monkfish | *Lophius piscatorius* | Habitat interaction | Least Concern | BAP Species | NO |
| Whiting | *Merlangius merlangus* | None suspected | Least Concern | BAP Species | NO |
| Hake | *Merluccius merluccius* | Habitat interaction | Least Concern | BAP Species | NO |
| Ling | *Molva molva* | None suspected | Not yet assessed | BAP Species | NO |
| Mackerel | *Scomber scombrus* | None suspected | Least Concern | BAP Species | NO |
| Invertebrates & Plant Species | *Scientific Name* | Potential Interaction | IUCN Red List Class | Concern in the UK | Concern? |
| European Spiny Lobster | *Palinurus elephas* | Caught in traps | Vulnerable | BAP Species | YES |
| Bearded Red Seaweed | *Anotrichium barbatum* | Pot contact | Not yet assessed | BAP Species | NO |
| Fan Mussel | *Atrina fragilis* | May attach to traps | Not yet assessed | BAP Species | NO |
| Brackish Hydroid | *Pachycordyle navis* | Pot contact | Not yet assessed | BAP Species | NO |
| Timid Burrowing Anemone | *Edwardsia timida* | Pot contact | Not yet assessed | BAP Species | NO |
| Common Maerl | *Phymatolithon calcareum* | Pot contact | Not yet assessed | BAP Species | NO |
| Coral Maerl | *Lithoamnion corraloides* | Pot contact | Not yet assessed | BAP Species | NO |
| Native Oyster | *Ostrea edulis* | May attach to traps | Not yet assessed | BAP Species | NO |
| Pink Sea Fan | *Eunicella verrucosa* | Pot contact | Vulnerable | BAP Species | NO |
| Red Seaweed | *Cruoria cruoriiformis* | Pot contact | Not yet assessed | BAP Species | NO |
| Sea Fan Anenome | *Amphianthus dohrnii* | Pot contact | Not yet assessed | BAP Species | NO |
| Sunset Cup Coral | *Leptopsammia pruvoti* | Pot contact | Not yet assessed | BAP Species | YES |
| Devon Cup Coral | *Caryophyllia smithii* | Pot contact | Not yet assessed | BAP Species | YES |
| Tall Sea Pen | *Funiculina quadrangularis* | Pot contact | Not yet assessed | BAP Species | NO |

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* NGOs interested in marine and freshwater.
* local communities and voluntary groups, active in protecting the coastal, marine and freshwater environments.

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1. Primary refers to direct interactions such as entanglement with down lines, whereas secondary refers to interactions that might be caused by damage inflicted by the trap to general habitat characteristics [↑](#footnote-ref-1)