Marine Conservation Zone Assessment document: CSMMCZ-FA 001

Marine Protected Area	Coquet to St Mary's MCZ
Features	High energy infralittoral rock Moderate energy circalittoral rock Moderate energy infralittoral rock
Gear Type	Light otter trawl Heavy otter trawl Scallop dredge
Gear/Feature Interaction Reference	CSMMCZ-061 CSMMCZ-062 CSMMCZ-063 CSMMCZ-093 CSMMCZ-094 CSMMCZ-095 CSMMCZ-221 CSMMCZ-222 CSMMCZ-223

Revision history		
Date	***Revision***	***Editor***
12/02/2019	Document created (prior to this document, the HRA document templates were used for Coquet to St Mary's MCZ Assessments. This document has therefore been created from Simple tLSE, Detailed tLSE and Appropriate Assessment documents created by Northumberland IFCA for this site in 2018).	NW
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03/06/2020	Comments received from NE and changes made	AA,CS

Note: this document has gone through various iterations, this document assesses towed demersal gear (light otter trawl, heavy otter trawl and scallop dredges) other fishing activities occurring in Coquet to St Mary's MCZ are assessed in other MCZ assessment documents. These documents will contain some of the same information regarding the site and the Part A assessment.

Contents

1. Introduction

1.1 Summary

Table 1 shows a summary of the outcomes of the Coquet to St Mary's MCZ Subtidal Reef Features x Mobile Gear Assessment. For the purpose of this assessment title mobile gear refers to Towed Demersal gear and Scallop Dredges (see Annex 1 for a breakdown of gear types).

Table 1: Assessment Summary

Features	Activity/gear	Part A outcome	Part B outcome	In-combination assessment	Confidence
High energy infralittoral rock And Moderate energy circalittoral rock And Moderate energy infralittoral rock	Light otter trawl	Capable of affecting (other than insignificantly)	Not capable of affecting (other than insignificantly)	No significant risk	M-H
	Heavy otter trawl		Capable of affecting (other than insignificantly)		M-H
	Scallop dredging		Capable of affecting (other than insignificantly)		M-H

1.2 Introduction

Table 2 shows the name and legal status of the site.

Table 2: Site details

Name and legal Status of site(s):	Name of site(s)	Legal status
	Coquet to St Mary's MCZ	MCZ

Coquet to St Mary's Marine Conservation Zone (MCZ) is an inshore site that runs along the southern half of the Northumberland Coast, within the northern North Sea in the north-east of England. The site covers approximately 192 km² of intertidal and subtidal habitats, stretching from Alnmouth in the north to Whitley Bay to the south, and from mean high water out to approximately 7.5km at its seaward-most extent. Coquet to St Mary's MCZ contains a mosaic of sediment and hard substrate benthic habitats, which in turn support a wide range of diverse communities.

The intertidal habitats range from rocky shore platforms and outcrops, to large sandy bays and beaches, each supporting unique communities. Rocky shores support large abundances of red algae, fucoids and kelp, whilst intertidal boulders provides shelter and habitat for a wide variety of crustaceans, molluscs, anemones and encrusting bryozoans. Elsewhere mud and sand flats contain burrowing bivalves and worm communities, whilst amphipods dominate the strandline of sandy beaches. Rare exposures of intertidal peat and clay are found along patches of the coastline, including fossilised tree roots from millions of years ago.

Shallow sloping infralittoral rock platforms also support thriving communities of macroalgae, which in turn support species including hydroids, sponges and anemones. The infralittoral rocky seabed gives way to circalittoral rock, where light penetration is too low to support diverse faunal communities, but instead a large diversity of benthic fauna flourish, including dead man's fingers, hornwrack and sponges. Circalittoral rocky habitats are interspersed between wide areas of subtidal mud, sand, and mixed sediments, each of which support their own range of species, including burrowing bivalves, bristle worms, sea pens and urchins. Sandwaves and ripples are formed by underwater currents shaping sediments on the seafloor.

The northern edge of the MCZ abuts with the Berwickshire and North Northumberland Coast SAC, and much of the northern section of the site overlaps with the Northumberland Marine SPA. The site overlaps with the intertidal parts of Coquet Island SPA and St Mary's Island Local Nature Reserve but does not include the terrestrial parts.

These sites are important for other species too, including marine mammals and seabirds. Grey seals make extensive use of St Mary's Island to the south of the MCZ as a haul out site, whilst the area is also important for white-beaked dolphins and minke whales. The site surrounds Coquet Island SPA, which supports internationally important numbers of terns, including the largest breeding colony of roseate terns in England. These species make extensive use of the MCZ for foraging and other activities.

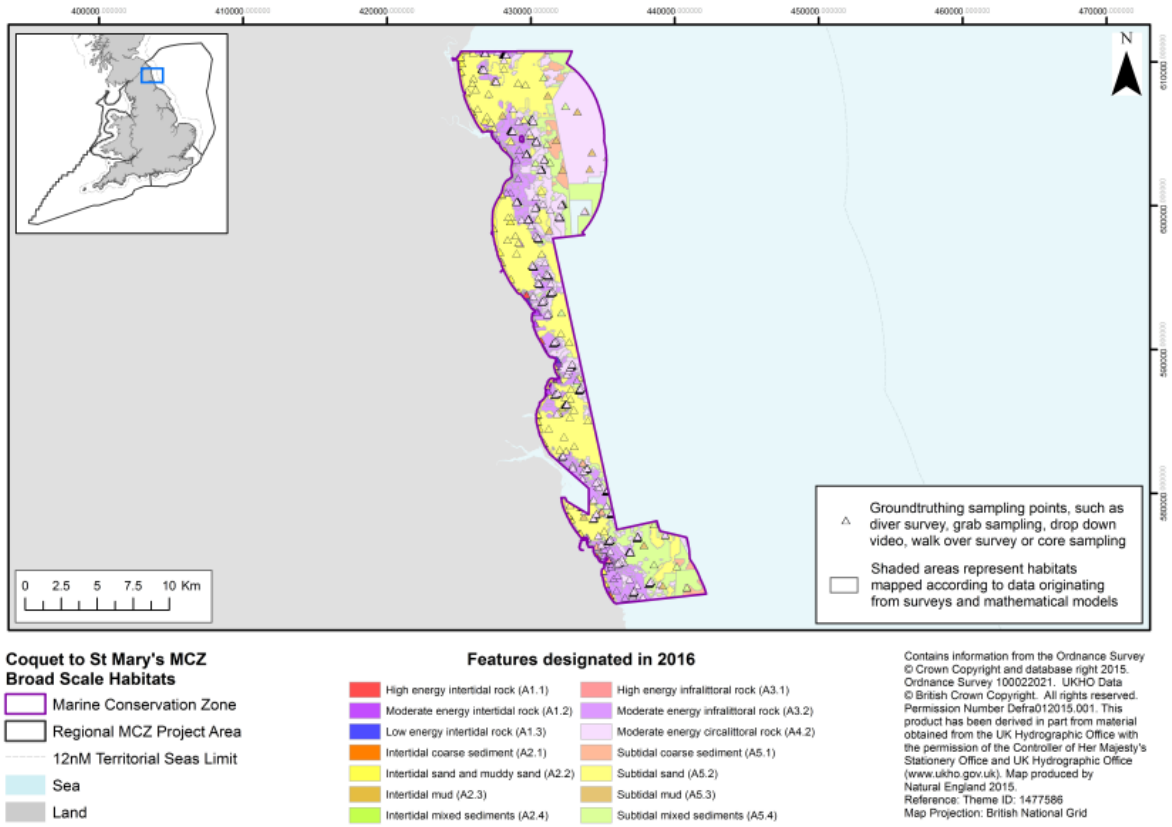

Figure 1: Coquet to St Mary's MCZ Feature Locations

The conservation objective for all MCZs is that the features:

(a) so far as already in favourable condition, remain in such condition; and
(b) so far as not already in favourable condition, be brought into such condition, and remain in such condition.

More specific information on how to achieve the conservation objective of an MCZ is provided in the general management approach within the factsheet for each site[1].

This assessment uses an initial screen of fishing activities and designated features, based on the Matrix of fisheries gear types and European marine site protected features[2] (hereafter 'the Matrix') developed as part of Defra's revised approach to the management of commercial fishing in European marine sites (EMS)[3]. The Matrix classifies interactions between EMS features and different fishing activities as red, amber, green or blue.

All interactions classified as 'blue' are screened out of this assessment as there is no pathway for impact. Interactions classified as 'green' are considered low risk but are included in this assessment and when assessing impacts in-combination with other activities. Interactions classified as amber are subject to full assessment. A classification of 'red' indicates that an assessment is not required however they are included in this assessment, the interaction should automatically be addressed through a management measure.

MCZs are associated with an overlapping but different set of designated features to those associated with SACs and SPAs and underlying SSSI. Therefore, for the purposes of the initial screen in this assessment, the designated features have been matched with equivalent SAC and SPA features. Where there is no clear match, a precautionary (i.e. more sensitive) SAC or SPA feature has been used. This precautionary matching applies only to the initial screen, and not to the later, more detailed assessment.

Table 3 shows the features for which this MCZ has been designated and associated general management approach.

Table 3: Designated features and general management approach

Feature	Fisheries Matrix Sub-feature	General Management Approach
High energy infralittoral rock	Sub-tidal bedrock reef	Maintain in favourable condition
High energy intertidal rock	Intertidal bedrock reef	Maintain in favourable condition
Intertidal coarse sediment	Intertidal gravel and sand	Maintain in favourable condition
Intertidal mixed sediments	Intertidal mixed sediments	Maintain in favourable condition
Intertidal mud	Intertidal mud	Maintain in favourable condition

[1] MCZ factsheets are available online: http://publications.naturalengland.org.uk/category/1721481
[2] www.gov.uk/government/publications/fisheries-in-european-marine-sites-matrix
[3] https://www.gov.uk/government/publications/revised-approach-to-the-management-of-commercial-fisheries-in-european-marine-sites-overarching-policy-and-delivery

Intertidal sand and muddy sand	Intertidal mud and sand	Maintain in favourable condition
Intertidal under boulder communities	Intertidal boulder and cobble reef	Maintain in favourable condition
Low energy intertidal rock	Intertidal bedrock reef	Maintain in favourable condition
Moderate energy circalittoral rock	Sub-tidal bedrock reef	Maintain in favourable condition
Moderate energy infralittoral rock	Sub-tidal bedrock reef	Maintain in favourable condition
Moderate energy intertidal rock	Intertidal bedrock reef	Maintain in favourable condition
Peat and clay exposures	N/A	Maintain in favourable condition
Subtidal coarse sediment	Coarse Sediment	Maintain in favourable condition
Subtidal mixed sediments	Subtidal mixed sediments	Maintain in favourable condition
Subtidal mud	Subtidal mud	Maintain in favourable condition
Subtidal sand	Subtidal sand	Maintain in favourable condition

The following features are considered in this assessment:

1.2.1 High energy infralittoral rock

High energy infralittoral rock is located below the low tide water limit, but close enough to the surface for sufficient light al allow plants and algae to grow. This feature is exposed to the full force of strong tidal currents and waves. As a result, this habitat is often dominated by the hardier and current-loving kelp and red algae. This feature is formed by open bedrock shelves, shallow sloping flat reefs, rocky outcrops, gullies and ledges. Areas of boulders may also occur, but all finer sediments are stripped away by the tide and waves.

Kelp forests thrive in this high energy environment, dominating the infralittoral fringe. Kelp holdfasts provide stability and shelter for a range of species, protecting them against predators, as well as strong tide and waves. Hardy red algae, such as dulse and sea beech, also thrive in this feature, either attaching to the rock or attaching epiphytically to the kelp canopy or stipes. Kelp holdfasts form microhabitats by providing refuge from the high energy environment for a diverse community of fauna, such as chitons, hydroids, sponges and topshells. Common lobster and anemones may shelter within cracks and crevices within the bedrock, whilst the bread crumb sponge and keel worms cover stable rocky areas.

High energy infralittoral rock is found just offshore from Seaton Sluice, running down the coast to surround St Mary's Island (Natural England, 2013). This feature is observed close to the intertidal zone, where the wave action is greatest, and is surrounded by moderate energy infralittoral rock on the seaward side.

The extent of this habitat is estimated to be 21.9 ha

1.2.2 Moderate energy circalittoral rock

Moderate energy circalittoral rock is located in deep waters, below the level where light can penetrate enough for extensive plant growth. However, where the majority of plant life is unable to survive, faunal turfs and diverse animal communities can be found. This feature consists of open bedrock, shallow sloping reefs, rocky outcrops, gullies and ledges.

Circalittoral boulders, cobbles and bedrock support a wide range of species, which may differ depending on the seabed topography, depth and tidal strength. Regularly occurring species include sponges, dead man's fingers, keel worms, hydroid and hornwrack (Amec, 2011). Faunal turfs of bryozoans, sponges and hydroids coat the bedrock and are grazed by edible urchins. Other common species include edible crabs, lobsters, brittlestars and common starfish.

Moderate energy circalittoral rock is common within the site's deep water habitats, located at the eastern side of the MCZ, offshore from Blyth, Newbiggin, Lynemouth and Cresswell. Additional areas are located offshore from Druridge Bay, Amble and east of Coquet Island. This feature is often overlaid by patches of subtidal mud, which can form a thin veneer over the bedrock (EMODnet, 2016) (Environment Agency (EA) and Cefas, 2014).

The extent of this habitat is estimated to be 6118.0 ha.

1.2.3 Moderate energy infralittoral rock

Moderate energy infralittoral rock lies just below the low tide mark, and is constantly submerged by seawater but close enough to the surface to allow plants and algae to flourish. This feature is formed by open bedrock shelves, shallow sloping flat reefs, rocky outcrops, gullies and ledges. Areas of boulders and cobbles may also occur.

Kelp forests of cuvie, dabberlocks and oarweed dominate the intertidal-infralittoral fringe, which in turn support red seaweeds, such as dulse and red rags. Within and below the kelp canopy, red algae grow epiphytically on the kelp stipes and holdfasts, as well as on the rock face. These include sea belt, pink crustose algae and sea beech (Amec, 2011). The kelp canopy and holdfasts provide stability and shelter for a diverse community of fauna, including the dahlia anemone, winkles, top shells, chitons, hydrozoans and bryozoans, protecting them against the tide and waves. Rock gunnels and common lobster may also shelter within the cracks and crevices of the rock face, whilst urchins graze the faunal and algae turfs which grow on the rocks.

This feature is highly abundant within the MCZ, and is observed offshore from Whitley Bay and St Mary's Island, up to Seaton Sluice (Marine Ecological Surveys Limited (MES) and The Marine Biological Association (MBA), 2014). Moderate energy infralittoral rock is also found off the coast from Blyth North Beach, Newbiggin, Lynemouth and Cresswell. This feature is also present off the coast of Low Hauxley, Amble and Coquet Island (Natural England, 2013) (EMODnet, 2016) (Environment Agency (EA) and Cefas, 2014).

The extent of this habitat is estimated to be 1166.9 ha.

1.3 Scope of this assessment - fishing activities assessed

The geographic scope of the assessment covers the whole site, and therefore includes all 16 designated features. As the whole site falls within the Northumberland Inshore Fisheries and Conservation District (Figure 2), the assessment and management of fishing activity will be carried out by Northumberland Inshore Fisheries and Conservation Authority (NIFCA).

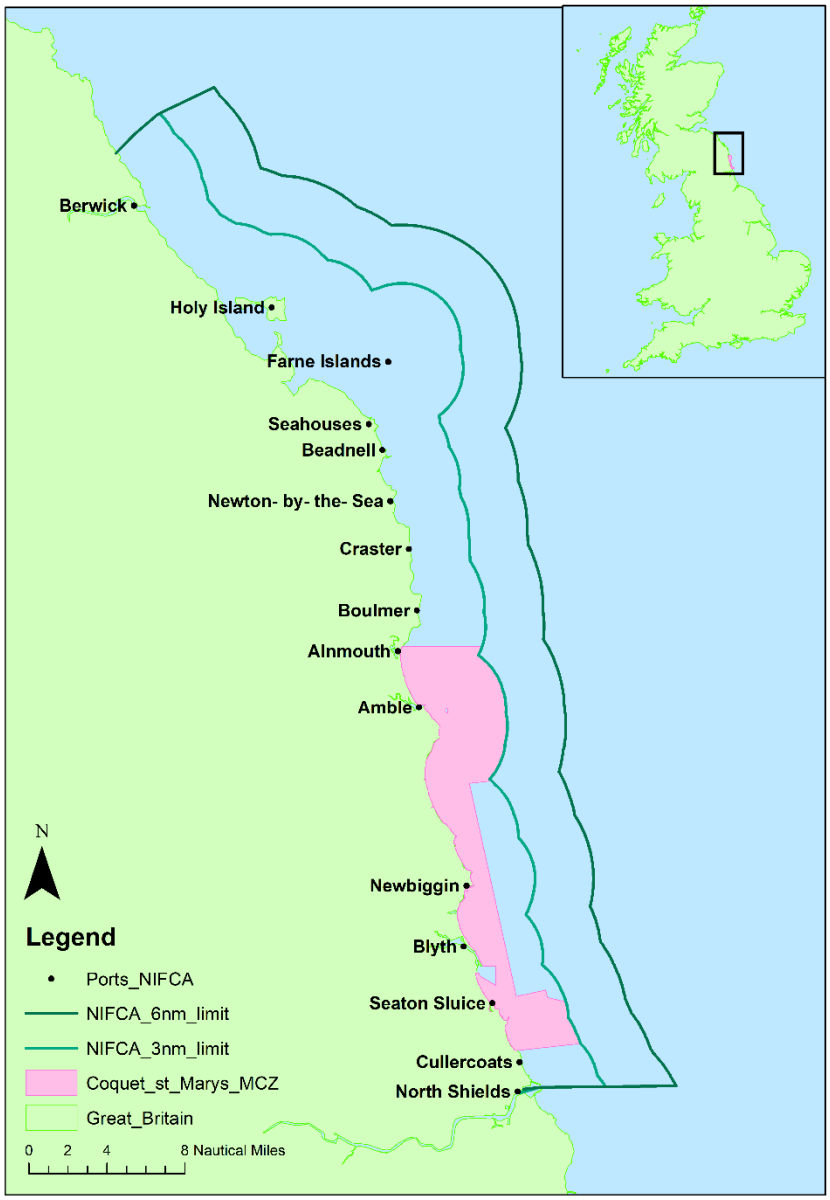

Figure 2. Location of Coquet to St Mary's MCZ in relation to the NIFCA District.

All fishing activity/feature interactions at this site identified as 'red', 'amber' and 'green' in the Matrix of fisheries gear types and European marine site protected features[2] (hereafter 'the Matrix') were considered for inclusion in this assessment. Fishing activity-feature interactions are also assessed if there are in-combination effects with other activities. Annex 1 shows all of the fishing activities with amber interactions assessed at this site.

Commercial sea fishing has the potential to vary in nature and intensity over time. This assessment considers a particular range of recent and likely future activity based on activity levels and type as identified in section 1.4.3 Fishing gear types considered in this assessment.

To ensure the achievement of the conservation objectives of the site is not hindered should future activity occur outside of this range, activity will be monitored at this site, and this assessment will be reviewed should certain limits be triggered, please see section 5.3 Review of this assessment.

[2] www.gov.uk/government/publications/fisheries-in-european-marine-sites-matrix

1.4 Activity description

1.4.1 Fisheries Access/existing management

UK vessels operate throughout this site. However, as the MCZ is an inshore MCZ (within 0-3nm), no non-UK vessels operate within the boundary of the site.

There are various Northumberland IFCA byelaws[3] that pertain to Coquet to St Mary's MCZ. The byelaws below are therefore relevant to this assessment:

BYELAW 1 – TRAWLING

- Restricted assess: a permit is required to fish using a trawl within the inner area (0-3nm from shore).
- Vessel size restrictions: no vessels over 12m in length can fish in the inner area (0-3nm from shore).
- Gear restriction: only a single trawl fitted with a single cod end and one pair of otter boards is permitted.

BYELAW 2 – DREDGING

- Restricted assess: a permit is required to fish using a dredge within the Northumberland IFCA district and therefore the whole MCZ.
- Gear restriction: a vessel is prohibited from fishing more than 10 dredges at any one time.

BYELAW 3 - CRUSTACEA CONSERVATION

- Prohibits landing of v-notched, mutilated or soft lobster, berried (egg bearing) edible crab and parts of velvet crab, edible crab and lobster.

BYELAW 4 – CRUSTACEA AND MOLLUSC PERMITTING AND POT LIMITATION

- Restricted assess: a permit is required to fish within the Northumberland IFCA district and therefore the whole MCZ.
- Pot limitation restricts the number of pots fished per permitted vessel to 800.

EMERGENCY BYELAW – BERRIED HENS

- Prohibits landing of berried (egg bearing) lobster.

MARKING OF FISHING GEAR AND KEEP BOXES

- All static fishing gear should be marked with a marker buoy or dahn that is clearly visible on the surface of the water and marked with the identification of the boat or contact details of the owner.

FIXED ENGINES

- Spatial and seasonal closures for static nets.

1.4.2 Evidence Sources

To determine the levels of fishing activity, the following evidence sources and analyses were used:

- VMS data
- NIFCA patrol sightings, recording GPS location of vessel and potting activity.
- Expert opinion from inshore fisheries and conservation officers (IFCOs).
- Information from the fishing industry.

Table 4 summarises the description, strengths and limitations of some of the evidence sources used.

[3] https://www.nifca.gov.uk/byelaws/

Table 4: Summary of generic confidence associated with fishing activity evidence

Evidence source	Confidence	Description, strengths and limitation
VMS data	Low	VMS data were requested from the MMO. Vessels over 12m must be fitted with VMS. VMS sends routine 'pings' to the control centre every 2 hours to track a vessel's course and speed. NIFCA has worked with the MMO to get information for every vessel operating in the district. The data has been filtered for speed (only boats travelling under 4 knots analysed). From this, officers have inferred that no mobile gear fishing activity can be detected in or around the MCZ. However, this can only be **inferred** from these data (see limitations below). The VMS data from the MMO is not fit for purpose in this case. Inferences can be made from the data available, however the infrequency of the tracking 'pings' (every 2 hours per vessel) and the lack of detail about the vessel's activity makes it unsuitable for detecting fishing activity with confidence. Further, information is only available for vessel over 12m, any activity within the MCZ will be carried out by vessels under 12 m (NIFCA Byelaw 1). Data analysed was from 2017 and 2018.
NIFCA patrol sightings	Moderate	NIFCA officers conduct routine patrols at sea throughout the district. Officers record all vessels sighted and their activity (fishing or steaming). Due to the nature of how this is recorded sightings data is estimated to be accurate to within 100m. NIFCA sightings data has a low sampling effort as it is limited by the number of patrols and the proximity of the patrol vessel to fishing activity. Data analysed was from 2016-2018.
Expert judgement (IFCOs)	Moderate	The NIFCA district is a relatively small area (~1400km^2) and a number of NIFCA officers have been in post for over 20 years. Coquet to St Mary's MCZ is in the south of the district within 3nm of the coast. NIFCAs patrol vessel and office is also in the south of the district resulting in patrol effort being much higher in the south than the north. Broad scale knowledge of fishing activity for this area is therefore very good.
Information from fishing industry	Low - Moderate	In 2019 NIFCA sent out a questionnaire to all NIFCA trawl permit holders asking: 1. Where do you trawl? 2. Which [trawl] gear do you use when fishing within the MCZ? 3. What habitats do you fish on using a trawl? 4. In the last year have you trawled within the MCZ? 5. What percentage of your time is spent trawling in the MCZ? 6. Do you know of any other vessels who fish within the MCZ? 7. Additional information. Of the 26 trawl permit holders which received the questionnaire responses were received from 11. As all permit holders known to trawl within the MCZ (officer knowledge and sightings data) responded to the questionnaire, it was inferred that those who did not respond do not trawl within the MCZ. As with any questionnaire there is some uncertainty to the accuracy of the information provided but it is believed to be reasonably accurate. From this, NIFCA are able to identify that activity occurs and, with a reasonable degree of confidence, where it occurs but cannot quantify effort due to a lack of available data such as VMS, log books etc.

1.4.3 Fishing gear types considered in this assessment

1.4.3.1 Demersal Trawls (light and heavy otter trawls)

Demersal otter trawls feature a variety of designs and riggings depending on the nature of the ground to be fished and the target species.

Otter trawl rigs consist of netting divided into wings, belly and cod-end. To the sides of the net wings, a pair of otter boards, or trawl doors, open the net horizontally and depress the trawl to the seabed. They also stimulate the fish to swim into the path of the trawl, sometimes through the creation of a sediment cloud. Cables known as bridles and sweeps connect the otter boards to the net wings and these can be from a few meters up to a few hundred meters long. The front of the trawl is framed on the top by a head line, which frequently has floats attached to keep the mouth of the net open, and a ground rope usually constructed of wire. The ground rope will often have associated ground gear attached to it to protect the net from damage and prevent entanglement with the bottom. Ground gear can vary from rock hoppers to bobbins of various dimensions. Tickler chains may also be attached to the net opening, and mechanically stimulate fish through contact with the bottom.

The managing fisheries in MPA gear glossary defines heavy otter trawl gear as any otter trawl that uses any of the following:

- sheet netting of greater than 4 mm twine thickness
- rockhoppers or discs of 200 mm or above diameter
- a chain for the foot/ground line (instead of wire)
- multiple tickler chains

The light otter trawl is defined as a gear which is anything less than the definition of a heavy otter trawl.

1.4.3.2 Dredges (scallop dredge)

Scallop dredges consist of a triangular frame approximately 750mm wide with a toothed bar at the front to penetrate the seabed and flip scallops out of the seabed and into a collecting bag behind it. The bottom of the collecting bag is made of chain links forming a chain mesh (the belly) to reduce damage to the ground. The top of the bag is made of either chain mesh or netting. Several dredges are towed behind a heavy spreading bar on each side of the vessel. The length of the bar and number of dredges is dictated by the power of the vessel and length of the vessel. Within the NIFCA district vessels are limited to 10 dredges (NIFCA Byelaw 2).

1.4.4 Fishing activity levels

1.4.4.1 Demersal Trawls (light and heavy otter trawls)

Low levels of otter trawling occur within the site. Only NIFCA trawl permit holders can fish within the inner area of the NIFCA district (0-3 nm), there was a total of 26 registered Trawl Permit holders in 2018. Not all permit holders fish within Coquet to St Mary's MCZ, NIFCA sightings data has recorded two vessels fishing within the MCZ, the majority of the trawling activity within the site occurs on the mud feature in the north east of the site but two sightings show trawling on the boundary of the reef feature. The main trawl grounds

within the inner area in the vicinity of the MCZ were removed from the boundary of the MCZ before designation (Figure 3).

Vessels tow in specific areas in order to avoid obstacles on the seabed such as rock, boulders, wrecks and static fishing gear. As such, tows are not over all of the subtidal mud area but follow distinct tracks. All vessels that fish using otter trawls within the site will follow these tracks. This equates to 25.4% of the subtidal mud within Coquet to St Mary's MCZ.

Analysis of NIFCA trawl permit returns (2019 onwards) and the results of a recent survey of trawl permit holders in the NIFCA district indicated that the majority of trawling activity in the site is carried out using light otter trawls. However, some fishers will use heavy gear if they are unsure of the ground after heavy weather events.

There are 32 trawl permit holders for 0-3nm of the NIFCA district.13 vessels submitted returns (other than nil returns) in 2019. 12 vessels report fishing in the inner areas (0-3nm). Within the Tyne-Amble 0-3nm area, those 12 vessels fished for an average of 5 months of the year, for an average of 8 days per month. The inner area refers to 0-3nm and so does includes the area outside of the MCZ (cut out area). Of these 12 vessels, officers, through expert knowledge, have confirmed 6 vessels may have fished in Coquet to St Mary's in 2019.

Therefore, the inferred **maximum** frequency of activity that occurs within the site is 6 vessels fishing an average of 8 days per month for an average 5 months per year. This equates to 40 trips per vessel per year which may fall into in Coquet to St Mary's MCZ. NIFCA has medium confidence in this estimate of fishing activity, with activity within the MCZ likely to be lower.

1.4.4.2 Dredges (scallop dredge)

Scallop dredging occurs sporadically, by a small number of boats within the NIFCA district. In 2018, there was a total of five Dredge Permit holders registered to fish with up to 10 dredges within the NIFCA district. All of these permits were registered to visiting fishing vessels and no local vessels applied for permits. All vessels are between 9 and 15 m in length. Scallop dredging activity occurs primarily in the North of the district at around 5-6 miles offshore. Scallop dredging was not observed within Coquet to St Mary's MCZ in 2018 but has occurred on an infrequent basis in previous years (Figure 4).

2. Part A Assessment

2.1 Introduction

Part A of this assessment was carried out in a manner that is consistent with the 'capable of affecting (other than insignificantly)' test required by section 126(1)(b) of the Marine and Coastal Access Act 2009[4].

For each fishing activity, a series of questions were asked:

1. Does the activity take place, or is it likely to take place in the future?
2. What are the potential pressures exerted by the activity on the feature?
3. Are the pressures capable of affecting (other than insignificantly) the protected features of the MCZ?

For each activity assessed in Part A, there were two possible outcomes for each identified pressure-feature interaction:

1. The pressure-feature interactions were not included for assessment in Part B if:
    a. the feature is not exposed to the pressure, and is not likely to be in the future; or
    b. the pressures are not capable of affecting (other than insignificantly) the protected features of the MCZ.

2. The pressure-feature interactions were included for assessment in Part B if:
    a. the feature is exposed to the pressure, or is likely to be in the future; and
    b. the pressure is capable of affecting (other than insignificantly) the feature; or
    c. it is not possible to determine whether the pressure is capable of affecting (other than insignificantly) the feature.

Consideration of exposure to or effect of a pressure on a protected feature of the MCZ includes consideration of exposure to or effect of that pressure on any ecological or geomorphological process on which the conservation of the protected feature is wholly or in part dependent.

Table 5 shows the Natural England conservation advice package used to inform this assessment.

Table 5: Advice packages used for assessment

Feature	Package	Link
High energy infralittoral rock High energy intertidal rock Intertidal coarse sediment Intertidal mixed sediments Intertidal mud Intertidal sand and muddy sand Intertidal under boulder communities Low energy intertidal rock	Natural England Conservation Advice for Marine Protected Areas Coquet to St Mary's MCZ	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UKMCZ0030&SiteName=coquet&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=

[4] www.legislation.gov.uk/ukpga/2009/23/contents

Moderate energy circalittoral rock Moderate energy infralittoral rock Moderate energy intertidal rock Peat and clay exposures Subtidal coarse sediment Subtidal mixed sediments Subtidal mud Subtidal sand		

2.2 Activities not taking place

Table 6 shows activities which are excluded from further assessment as they do not take place and are not likely to take place in the future. All activities listed in Annex 1 have been considered at this stage of the assessment.

Table 6: Activities not taking place and not likely to take place in the future

Feature	**Gear type**	**Justification**
Intertidal mud and sand, Intertidal gravel and sand, Intertidal mixed sediments, Intertidal Underboulder Communities/intertidal boulder and cobble reef, Intertidal Bedrock Reef/High energy intertidal rock, Intertidal Bedrock Reef /Moderate energy Intertidal Rock, Intertidal Bedrock Reef /Low energy intertidal rock, Peat and Clay	Light otter trawl, Heavy Otter trawl, Scallop Dredging, Gill Nets, Trammel Nets and Entangling Nets	No interaction between activity and features within the Coquet to St Mary's MCZ or the surrounding area/NIFCA district (NIFCA Offciers, pers. comms.).
Intertidal Underboulder Communities, Intertidal Bedrock Reef/High energy intertidal rock, Intertidal Bedrock Reef /Moderate energy Intertidal Rock, Intertidal Bedrock Reef /Low energy intertidal	Digging with forks	No interaction between features and activity within Coquet to St Mary's MCZ (NIFCA Officer, pers. comms.).

rock, Intertidal coarse sediment, Peat and Clay Exposures.		
Subtidal sand (high energy), Subtidal mud, Intertidal mud, Intertidal mud and sand, Intertidal gravel and sand, Intertidal mixed sediments, Subtidal mixed sediments, Coarse sediment (high energy), Intertidal Underboulder Communities/intertidal boulder and cobble reef, Intertidal Bedrock Reef/High energy intertidal rock, Intertidal Bedrock Reef /Moderate energy Intertidal Rock, Intertidal Bedrock Reef /Low energy intertidal rock, High energy infralittoral rock/ Subtidal bedrock reef & Subtidal boulder & cobble reef, Moderate energy infralittoral rock/ Subtidal bedrock reef & Subtidal boulder & cobble reef, High energy circalittoral rock/ Subtidal bedrock reef & Subtidal boulder & cobble reef, Peat and Clay Exposures (Intertidal).	Commercial diving	No current activity (NIFCA Officer, pers. comms., 2018).
	Bait dragging	No current activity (NIFCA Officer, pers. comms., 2018).
	Crab tiling (Fisheries Aggregation Devices)	No current activity (NIFCA Officer, pers. comms., 2018).
	Intertidal handwork (from vessel)	No current activity (NIFCA Officer, pers. comms., 2018).
	Trammel netting	No current activity (NIFCA Officer, pers. comms., 2018).
	Drift nets	No current activity (NIFCA Officer, pers. comms., 2018).
	Beam Trawl (shrimp)	No current activity (NIFCA Officer, pers. comms., 2018).
	Beam Trawl (whitefish)	No current activity (NIFCA Officer, pers. comms., 2018).
	Beam Trawl (pulse/wing)	No current activity (NIFCA Officer, pers. comms., 2018).
	Multi-rig trawls	Regulated activity Multi-rig trawls is prohibited within the NIFCA district (NIFCA Byelaw 1: Trawling). No current activity within the Coquet to St Mary's MCZ or the surrounding area/NIFCA district (NIFCA Officer, pers. comms., 2018).
	Pair trawling	Regulated activity pair trawling is prohibited within the NIFCA district (NIFCA Byelaw 1: Trawling). No current activity within the Coquet to St Mary's MCZ or the surrounding area/NIFCA district (NIFCA Officer, pers. comms., 2018).
	Anchor Seine	No current activity (NIFCA Officer, pers. comms., 2018).
	Scottish/fly seine	No current activity (NIFCA Officer, pers. comms., 2018).
	Dredges (towed): - Mussels, clams, oysters;	No current activity (NIFCA Officer, pers. comms., 2018).
	Dredges (other): - Suction (cockles) - Tractor	No current activity (NIFCA Officer, pers. comms., 2018).
	Cuttle pots	No current activity (NIFCA Officer, pers. comms., 2018).
	Fish traps	No current activity (NIFCA Officer, pers. comms., 2018).
	Seine nets and other: - Beach sine/ring nets	No current activity (NIFCA Officer, pers. comms., 2018).

	- Shrimp push-nets - Fyke and stakenets.	
Peat and Clay Exposures (Intertidal).	Pots/creels (crustacea/gastropods)	No interaction between features and activity within Coquet to St Mary's MCZ (NIFCA sightings data) for intertidal peat and clay. Subtidal peat and clay has not been considered in this assessment due to insufficient evidence.

2.3 Potential pressures exerted by the activities on the feature

For the remaining activities on subtidal rock, potential pressures were identified using the Natural England conservation advice identified in table 5 and associated advice on operations tables alongside NIFCA's NE representative. All pressures identified other than those categorised as 'not relevant' were included. This assessment is focussed on mobile gear and so only pressures from those activities have been included here. Other activities have been assessed in other MCZ assessment documents.

Tables 7a-c show the potential pressures identified for each feature.

Table 7a: Potential pressures for gears on High energy infralittoral rock (pressures capable of effecting other than insignificantly are in bold).

Aggregated method	Potential pressures
Otter trawls (Light otter trawl, Heavy Otter trawl)	**Abrasion/disturbance if the substrate on the surface of the seabed.**
	Changes in suspended solids (water clarity)
	Removal of non-target species
	Introduction or spread of invasive non-native species
	Introduction of light
	Nutrient enrichment
	Organic enrichment
	Physical change (to another seabed type)
Scallop Dredge	**Abrasion/disturbance if the substrate on the surface of the seabed.**
	Changes in suspended solids (water clarity)
	Removal of non-target species
	Introduction or spread of invasive non-native species
	Introduction of light
	Introduction of microbial pathogens
	Nutrient enrichment
	Organic enrichment
	Physical change (to another seabed type)

Table 7b: Potential pressures for gears on Moderate Energy Infralittoral Rock (pressures capable of effecting other than insignificantly are in bold).

Aggregated method	Potential pressures
Otter trawls (Light otter trawl, Heavy Otter trawl)	**Abrasion/disturbance if the substrate on the surface of the seabed.**
	Changes in suspended solids (water clarity)

	Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion
	Removal of non-target species
	Smothering and siltation rate changes (Light)
	Introduction or spread of invasive non-native species
	Deoxygenation
	Introduction of light
	Nutrient enrichment
	Organic enrichment
	Physical change (to another seabed type)
Scallop Dredge	**Abrasion/disturbance if the substrate on the surface of the seabed.**
	Changes in suspended solids (water clarity)
	Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion
	Removal of non-target species
	Smothering and siltation rate changes (Light)
	Introduction or spread of invasive non-native species
	Deoxygenation
	Introduction of microbial pathogens
	Introduction of light
	Nutrient enrichment
	Organic enrichment
	Physical change (to another seabed type)

Table 7c: Potential pressures for gears on Moderate Energy Circalittoral Rock (pressures capable of effecting other than insignificantly are in bold).

Aggregated method	**Potential pressures**
Otter trawls (Light otter trawl, Heavy Otter trawl)	**Abrasion/disturbance if the substrate on the surface of the seabed.**
	Changes in suspended solids (water clarity)
	Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion
	Removal of non-target species
	Smothering and siltation rate changes (Light)
	Introduction or spread of invasive non-native species
	Deoxygenation
	Organic enrichment
	Physical change (to another seabed type)
Scallop Dredge	**Abrasion/disturbance if the substrate on the surface of the seabed.**
	Changes in suspended solids (water clarity)
	Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion
	Removal of non-target species
	Smothering and siltation rate changes (Light)
	Introduction or spread of invasive non-native species
	Introduction of microbial pathogens
	Deoxygenation
	Organic enrichment

	Physical change (to another seabed type)

2.4 Significance of effects/impacts

To determine whether each pressure is capable of affecting (other than insignificantly) the site's feature(s), the sensitivity assessments and risk profiling of pressures from the advice on operations section of the Natural England conservation advice package were used alongside NIFCA's NE representative.

Tables 8a-c identify the pressures from particular gears which are capable of affecting (other than insignificantly) each subtidal rock feature. Where a pressure from a particular gear is identified as not being capable of affecting (other than insignificantly), justification is provided (grey). Features with similar sensitivities have been considered together. Where a pressure from a particular gear is identified as being capable of affecting a feature, it is highlighted in red and taken to the next stage of assessment (Part B – Section 3).

To ensure the effects of fishing activities in-combination with other activities (including other fishing activities) are fully assessed, the pressures from amber activities which are not capable of affecting (other than insignificantly) the site's feature(s) but which do interact with the feature(s) are included in the in-combination assessment (Section 4).

Table 8a: Summary of pressures from specific activities on high energy infralittoral rock taken to Part B.

Potential pressures	Demersal Trawl		Dredges
	Light otter trawls	Heavy otter trawls	Scallop dredge
Abrasion/disturbance if the substrate on the surface of the seabed.	Capable of affecting (other than insignificantly) – Abrasion/surface disturbance can be caused by contact between the gear/anchors and the sea bed.		
Changes in suspended solids (water clarity)	Capable of affecting (other than insignificantly) - This pressure may result from physical disturbance of the sediment, along with hydrodynamic action caused by the passage of towed gear.		
Removal of non-target species	Capable of affecting (other than insignificantly) – Removal of non-target species by fishing activities will affect the presence and/or population size of the feature.		
Removal of target species	Not capable of affecting (other than insignificantly) – target species not found on this habitat		Capable of affecting (other than insignificantly)
Introduction or spread of invasive non-native species	Not capable of affecting (other than insignificantly) – Ballast water is the principal vector for invasive non-indigenous species[5]. Fishing vessels less than 45m must have permanent ballast and thus this vector is not available[6].		
Introduction of microbial pathogens	Not capable of affecting (other than insignificantly) – Coquet to St Mary's MCZ is not a shellfish production site.		
Introduction of light	Not capable of affecting (other than insignificantly) – Introduction of light from fishing activities is unlikely to significantly affect the feature.		
Nutrient enrichment	Not capable of affecting (other than insignificantly) – Habitat is subject to a degree of wave action or tidal currents suitable enough to make nutrient enrichment unlikely as nutrient content will be removed from the area.		
Organic enrichment	Not capable of affecting (other than insignificantly) – Habitat is subject to a degree of wave action or tidal currents suitable enough to make organic enrichment unlikely		
Physical change (to another seabed type)	Not capable of affecting (other than insignificantly) – The site is a highly dynamic environment, which results in the natural movement of sediment, it is therefore unlikely that fishing activity would be capable of significantly changing seabed type.		
Deoxygenation	Not capable of affecting (other than insignificantly) – Coquet to St Mary's MCZ is a highly dynamic environment, oxygen levels will be replenished by wave and tidal movements.		

[5] http://qsr2010.ospar.org/media/assessments/p00440_Shipping_Assessment.pdf
[6] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/441098/MGN_501_Combined.pdf

Table 8b: Summary of pressures from specific activities on moderate energy infralittoral rock taken to Part B.

Potential pressures	Demersal Trawl		Dredges
	Light otter trawls	Heavy otter trawls	Scallop dredge
Abrasion/disturbance if the substrate on the surface of the seabed.	Capable of affecting (other than insignificantly) – Abrasion/surface disturbance can be caused by contact between the gear/anchors and the sea bed.		
Changes in suspended solids (water clarity)	Capable of affecting (other than insignificantly) - This pressure may result from physical disturbance of the sediment, along with hydrodynamic action caused by the passage of towed gear.		
Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion	Capable of affecting (other than insignificantly) - Gears are designed to dig into the seabed.		
Removal of non-target species	Capable of affecting (other than insignificantly) – Removal of non-target species by fishing activities will affect the presence and/or population size of the feature.		
Smothering and siltation rate changes (Light)	Capable of affecting (other than insignificantly) - This pressure may result from physical disturbance of the sediment, along with hydrodynamic action caused by the passage of towed gear.		
Introduction or spread of invasive non-native species	Not capable of affecting (other than insignificantly) – Ballast water is the principal vector for invasive non-indigenous species[7]. Fishing vessels less than 45m must have permanent ballast and thus this vector is not available[8].		
Introduction of microbial pathogens	Not capable of affecting (other than insignificantly) – Coquet to St Mary's MCZ is not a shellfish production site.		
Introduction of light	Not capable of affecting (other than insignificantly) – Introduction of light from fishing activities is unlikely to significantly affect the feature.		
Nutrient enrichment	Not capable of affecting (other than insignificantly) – Habitat is subject to a degree of wave action or tidal currents suitable enough to make nutrient enrichment unlikely as nutrient content will be removed from the area.		

[7] http://qsr2010.ospar.org/media/assessments/p00440_Shipping_Assessment.pdf
[8] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/441098/MGN_501_Combined.pdf

Organic enrichment	Not capable of affecting (other than insignificantly) – Habitat is subject to a degree of wave action or tidal currents suitable enough to make organic enrichment unlikely
Physical change (to another seabed type)	Not capable of affecting (other than insignificantly) – The site is a highly dynamic environment, which results in the natural movement of sediment, it is therefore unlikely that fishing activity would be capable of significantly changing seabed type.
Deoxygenation	Not capable of affecting (other than insignificantly) – Coquet to St Mary's MCZ is a highly dynamic environment, oxygen levels will be replenished by wave and tidal movements.

Table 8c: Summary of pressures from specific activities on moderate energy circalittoral rock taken to Part B.

Potential pressures	Demersal Trawl		Dredges
	Light otter trawls	Heavy otter trawls	Scallop dredge
Abrasion/disturbance if the substrate on the surface of the seabed.	Capable of affecting (other than insignificantly) – Abrasion/surface disturbance can be caused by contact between the gear/anchors and the sea bed.		
Changes in suspended solids (water clarity)	Capable of affecting (other than insignificantly) - This pressure may result from physical disturbance of the sediment, along with hydrodynamic action caused by the passage of towed gear.		
Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion	Capable of affecting (other than insignificantly) - Gears are designed to dig into the seabed.		
Removal of non-target species	Capable of affecting (other than insignificantly) – Removal of non-target species by fishing activities will affect the presence and/or population size of the feature.		
Smothering and siltation rate changes (Light)	Capable of affecting (other than insignificantly) - This pressure may result from physical disturbance of the sediment, along with hydrodynamic action caused by the passage of towed gear.		
Introduction or spread of invasive non-native species	Not capable of affecting (other than insignificantly) – Ballast water is the principal vector for invasive non-indigenous species[9]. Fishing vessels less than 45m must have permanent ballast and thus this vector is not available[10].		

[9] http://qsr2010.ospar.org/media/assessments/p00440_Shipping_Assessment.pdf
[10] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/441098/MGN_501_Combined.pdf

Barriers to species movement	Not capable of affecting (other than insignificantly) – Fishing activity is unlikely to significantly affect movement of species.
Introduction of microbial pathogens	Not capable of affecting (other than insignificantly) – Coquet to St Mary's MCZ is not a shellfish production site.
Introduction of light	Not capable of affecting (other than insignificantly) – Introduction of light from fishing activities is unlikely to significantly affect the feature.
Organic enrichment	Not capable of affecting (other than insignificantly) – Habitat is subject to a degree of wave action or tidal currents suitable enough to make organic enrichment unlikely
Physical change (to another seabed type)	Not capable of affecting (other than insignificantly) – The site is a highly dynamic environment, which results in the natural movement of sediment, it is therefore unlikely that fishing activity would be capable of significantly changing seabed type.
Deoxygenation	Not capable of affecting (other than insignificantly) – Coquet to St Mary's MCZ is a highly dynamic environment, oxygen levels will be replenished by wave and tidal movements.

3. Part B Assessment

3.1 Demersal trawl and towed dredges x High energy infralittoral rock, moderate energy infralittoral rock and moderate energy circalittoral rock

Part B of this assessment was carried out in a manner that is consistent with the 'significant risk' test required by section 126(2) of the Marine and Coastal Access Act 2009.

Tables 9a-c show the fishing activities and pressures included for assessment in part B. Pressures with similar potential impacts to a particular feature were grouped to save repetition during this assessment. Pressures capable of affecting (other than insignificantly) the conservation objectives of the site are shown in white rows.

This Section is the assessment for the interaction between mobile fishing gears (demersal trawls and towed dredges) and subtidal rock features (high energy infralittoral rock, moderate energy infralittoral rock and moderate energy circalittoral rock).

Table 9a: Fishing activities and pressures included for part B assessment for High energy infralittoral rock.

Natural England Aggregated Method	Fishing gear type	Pressures
Demersal trawl	Light otter trawl	• Abrasion/disturbance of seabed. surface substrate • Removal of non-target species.
	Heavy otter trawl	
Towed Dredges	Scallop Dredge	
Demersal trawl	Light otter trawl	• Changes in suspended solids (water clarity).
	Heavy otter trawl	
Towed Dredges	Scallop Dredge	

Table 9b: Fishing activities and pressures included for part B assessment for Moderate Energy Infralittoral Rock.

Natural England Aggregated Method	Fishing gear type	Pressures
Demersal trawl	Light otter trawl	• Abrasion/disturbance if the substrate on the surface of the seabed. • Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion. • Removal of non-target species.
	Heavy otter trawl	
Towed Dredges	Scallop Dredge	
Demersal trawl	Light otter trawl	• Changes in suspended solids (water clarity). • Smothering and siltation rate changes (Light).
	Heavy otter trawl	
Towed Dredges	Scallop Dredge	

Table 9c: Fishing activities and pressures included for part B assessment for Moderate Energy Circalittoral Rock.

Natural England Aggregated Method	Fishing gear type	Pressures
Demersal trawl	Light otter trawl	• Abrasion/disturbance if the substrate on the surface of the seabed. • Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion. • Removal of non-target species.
	Heavy otter trawl	
Towed Dredges	Scallop Dredge	
Demersal trawl	Light otter trawl	• Changes in suspended solids (water clarity). • Smothering and siltation rate changes (Light).
	Heavy otter trawl	
Towed Dredges	Scallop Dredge	

The important targets for favourable condition were identified within Natural England's conservation advice supplementary advice tables. 'Important' in this context means only those targets relating to attributes that will most efficiently and directly help to define condition. These attributes should be clearly capable of identifying a change in condition.

Tables 10 shows which targets were identified as important. The impacts of pressures on features were assessed against these targets to determine whether the activities causing the pressures are compatible with the site's conservation objectives. Information highlighted in red is where pressures listed above may impact on favourable condition targets.

Table 10: Relevant favourable condition targets for identified pressures to High energy infralittoral rock, Moderate Energy Infralittoral Rock, Moderate Energy Circalittoral Rock. Rows in red show relevant targets that may be affected by one or more pressures, rows in yellow show targets that cannot be quantified with the current level of information available.

Attribute	Target	Relevance/justification
Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of rock communities.	Relevant to all pressures.
Extent and distribution	Maintain the total extent and spatial distribution of infralittoral rock, subject to natural variation in sediment veneer.	Pressures will not significantly alter the extent and distribution of the feature.
Structure and function: presence and abundance of key structural and influential species	[Maintain OR Recover OR Restore] the abundance of listed species*, to enable each of them to be a viable component of the habitat.	Key species not identified therefore cannot be assessed. To be reviewed when updated conservation advice is provided.
Structure: non-native species and pathogens	Restrict the introduction and spread of non-native species and pathogens, and their impacts.	Pressures will not result in the introduction and spread of non-native species and pathogens, and their impacts at a significant level.
Structure: physical structure of rocky substrate	Maintain the surface and structural complexity, and the stability of the reef structure.	Relevant to: • Abrasion/disturbance if the substrate on the surface of the seabed. • Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion.

Structure: species composition of component communities	Maintain the species composition of component communities.	Relevant to all pressures.
Supporting processes: energy / exposure	Maintain the natural physical energy resulting from waves, tides and other water flows, so that the exposure does not cause alteration to the biotopes and stability, across the habitat.	Pressures will not significantly alter the energy or exposure of the feature.
Supporting processes: physico-chemical properties	Maintain the natural physico-chemical properties of the water.	Pressures will not significantly impact upon the natural physico-chemical properties of the water.
Supporting processes: sedimentation rate	Maintain the natural rate of sediment deposition.	Pressures will not significantly alter sedimentation rate.
Supporting processes: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing levels.	Pressures will not significantly impact upon nutrient levels.
Supporting processes: water quality - dissolved oxygen	Maintain the dissolved oxygen (DO) concentration at levels equating to High Ecological Status (specifically ≥ 5.7 mg per litre (at 35 salinity) for 95 % of the year), avoiding deterioration from existing levels.	Pressures will not significantly impact levels of dissolved oxygen.
Supporting processes: water quality - nutrients	Maintain water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features, avoiding deterioration from existing levels.	Pressures will not significantly impact upon nutrient levels.
Supporting processes: water quality - turbidity	Maintain natural levels of turbidity (eg concentrations of suspended sediment, plankton and other material) across the habitat.	Pressures will not significantly impact upon turbidity.

3.2 Fishing gear types used

3.2.1 Demersal Trawls (light and heavy otter trawls)

A bottom trawl is constructed like a cone-shaped net that is towed (by one or two boats) on the bottom. It They are designed to catch species above the seabed but do however have components which remain in contact with the seabed during the fishing activity (Lokkeborg, 2005). Parts of the gear such as ropes, chains, sole plates and teeth come into contact with the sea floor to keep the trawl mouth open but may not remain in continuous contact. Other components such as the trawl doors must penetrate the sediment for the duration of the fishing activity and could impact the seabed (Lokkeborg, 2005).

Three categories of bottom trawls can be distinguished based on how their horizontal opening is maintained: demersal otter trawls, demersal pair trawls and beam trawls. This assessment concerns the first of the three: **demersal light otter trawls**, pair trawls and beam trawls do not operate within the NIFCA district (NIFCA Byelaw 1).

Demersal otter trawls feature a variety of designs and riggings depending on the nature of the ground to be fished and the target species.

Otter trawl rigs consist of netting divided into wings, belly and cod-end. To the sides of the net wings, a pair of otter boards, or trawl doors, open the net horizontally and depress the trawl to the seabed. They also stimulate the fish to swim into the path of the trawl, sometimes through the creation of a sediment cloud. Cables known as bridles and sweeps connect the otter boards to the net wings and these can be from a few meters up to a few hundred meters long. The front of the trawl is framed on the top by a headline, which frequently has floats attached to keep the mouth of the net open, and a ground rope usually constructed of wire. The ground rope will often have associated ground gear attached to it to protect the net from damage and prevent entanglement with the bottom. Ground gear can vary from rock hoppers to bobbins of various dimensions. Tickler chains may also be attached to the net opening, and mechanically stimulate fish through contact with the bottom.

The managing fisheries in MPA gear glossary defines heavy otter trawl gear as any otter trawl that uses any of the following:

- sheet netting of greater than 4 mm twine thickness
- rockhoppers or discs of 200 mm or above diameter
- a chain for the foot/ground line (instead of wire)
- multiple tickler chains

The light otter trawl is defined as a gear which is anything less than the definition of a heavy otter trawl.

3.2.2 Dredges (scallop dredge)

Scallop dredges consist of a triangular frame approximately 750mm wide with a toothed bar at the front to penetrate the seabed and flip scallops out of the seabed and into a collecting bag behind it. The bottom of the collecting bag is made of chain links forming a chain mesh (the belly) to reduce damage to the gear. The top of the bag is made of either chain mesh or netting. Several dredges are towed behind a heavy spreading bar on each side of the vessel. The length of the bar and number of dredges is dictated by the power of the vessel and length of the vessel. Within the NIFCA district vessels are limited to 10 dredges (NIFCA Byelaw 2).

3.3 Fishing activity levels in Coquet to St Mary's MCZ

3.3.1 Demersal Trawls (light and heavy otter trawls)

The local fishery takes place between 3-25 miles offshore with best catches being seen during the autumn and winter months. When the fishery is at its height it also attracts a large number of visiting trawlers from Scotland, Northern Ireland and other English ports. The majority of the visiting trawlers are larger and more powerful than the local boats, and this enables them to work further offshore in most weather conditions. In the summer months a number of smaller under 10 metre boats from North Shields, Blyth and Amble move up to the Firth of Forth to target the summer prawns, normally working daylight and darkness throughout the week and coming home at weekends. The remaining under 10 metre boats and the larger local trawlers tend to work further offshore (beyond 6 nm) in the summer when the weather is usually finer, targeting both white fish and prawns (A. Browne, NIFCA, November 2018, pers. comms.).

In the last 5 years the trawl fleet has become ever more reliant on the local prawn (*Nephrops norvegicus*) fishery, which is now the fleet's principal fishery. Anecdotal evidence indicates that the decline in the use of demersal light otter trawls within the NIFCA district is due to various factors, but predominantly the introduction of Total Allowable Catches and quotas in 1983, which drove many towards potting for shellfish. Locally, the cessation of dumping sewage sludge at sea around 15 years ago, particularly off the River Tyne and Blyth, is indirectly attributed to a decline in local cod (*Gadhus morhua*) stocks, which used the dumping grounds for feeding.

Much of the NIFCA district is designated as the Farne Deeps ground. This is defined as ICES rectangles 38E8, 38E9, 39E9, 40E8 and 40E9. Here, there are different regulations on mesh sizes and a quota. Mesh sizes of the trawls are dependent on their target species, for the UK sizes are specified under Council Regulation (EC) No 2019/1241 of 25 July 2019 for the conservation of fishery resources through technical measures for the **protection of juveniles of marine organisms**. Annex 1 states the minimum mesh sizes for towed gears, applicable to our district, with 80 mm used for *Nephrops*. Within the Farne Deeps the mesh size has been increased to 90 mm. *Nephrops* are a quota species, for 2018, the quota for the under 10 fleet was capped at 20 tonne per quarter and for the over 10 fleet at 20 tonne per quarter within the Farne Deeps, limiting fishing activity when this quota is reached.

There is relatively small fishery targeting flatfish (mainly plaice) within sandy bays in Coquet to St Mary's MCZ. This is predominantly Druridge Bay and Cambois Bay. There is one boat who historically trawled in these areas who started trawling again in 2019, and one other boat who has been seen trawling in the bays anecdotally (M. Southerton, NIFCO pers. comm. 2019). Target flatfish species minimum sizes are also controlled under Council Regulation (EC) No 2019/1241 of 25 July 2019 for the conservation of fishery resources through technical measures for the **protection of juveniles of marine organisms**.

The main data source used to generate this information were NIFCA sightings data and NIFCA permit returns (permit returns for byelaw one were only implemented as a permit condition in 2019 and therefore there is only one year of data available for analysis). It was not possible to use VMS data for the purpose of this assessment as information is only available for vessels over 12m, any activity within the MCZ will be carried out by vessels under 12 m (NIFCA Byelaw 1).

To fish within Coquet to St Mary's MCZ, fishers must obtain a NIFCA trawl permit (NIFCA Byelaw 1) because the MCZ sits within the 3 nm boundary. The permit allows fishers to trawl within 0-3 nm of the NIFCA district. There were 34 registered Byelaw 1 Trawl permit holders in 2019. The number of permit holders decreased from 34 in 2016, to 25 in 2018, but increased to 34 again in 2019 (Table 11).

Table 11 The number of vessels with a NIFCA Byelaw 1 Trawling permit from 2016-2019.

Year	Number of permit holders
2016	34
2017	32
2018	25
2019	34

The majority of permit holders do not fish within Coquet to St Mary's MCZ as during the stakeholder led process the main trawl grounds within the 0-3 nm area not included in the MCZ before designation (Net Gain, 2013) (Figure 3). Within the boundary of the MCZ, the majority of trawling activity within the site occurs on the mud feature in the north east of the site around Coquet Island targeting prawns. NIFCA sightings data recorded two vessels fishing within the MCZ in 2019 and 3 vessels fishing within the MCZ in 2018. The target habitat is subtidal mud, but two sightings show trawling activity on the boundary of the reef feature. Cognisant of the limitations of the sightings data in terms of location accuracy, these sightings have been verified using plotter data from a fishing vessel showing GPS tracks of the area with the MCZ that light otter trawl tows are carried out over. This verifies NIFCA sightings data's accuracy giving higher confidence in the results.

Vessels tow in specific areas in order to avoid obstacles on the seabed such as rock, boulders, wrecks and static fishing gear. As such, tows are not conducted over all of the subtidal mud area but follow distinct tracks. Conversations with the fishing industry in the North of the site suggest that all vessels that fish using otter trawls within the site will follow these tracks. Using the plotter data (described above) it was possible to calculate the area trawled within Coquet to St Mary's MCZ, it equates to 25.4% of the subtidal mud feature area within the site (information obtained through liaison with the fishing industry, not suitable for public dissemination). Anecdotally, we are aware that trawling also targets sandy bays for flatfish.

Analysis of NIFCA trawl permit returns (2019 onwards) and the results of a recent survey of trawl permit holders in the NIFCA district indicated that the majority of trawling activity in the site is carried out using light otter trawls. However, some fishers will use 'heavy gear' if they are unsure of the ground after heavy weather events. 'Heavy gear' means a trawl net with rockhopper (rubber) discs attached to the footrope. This are used to protect the nets when towing gear over rocky ground (Seafish, 2019). Using this gear would allow boats to trawl over, or close to, the protected subtidal reef features. NIFCA sightings data shows evidence of trawling activity over subtidal reef features (Figure 3).

As a condition of the Byelaw 1 permit, fishers must fill in monthly catch returns forms detailing the weight of landed species, number of days fished and area fished (0-3 nm; 3-6 nm; Tyne-Amble, Amble-Scottish Borders).13 vessels submitted returns (other than nil returns) in 2019. 12 vessels report fishing in the inner areas (0-3nm) and within the Tyne-Amble area. Those 12 vessels fished for an average of 5 months of the year, for an average of 8 days per month. The inner area refers to 0-3nm and so does includes the area outside of the MCZ (cut out area Figure 3). Of these 12 vessels, officers, through expert knowledge, have confirmed 6 vessels may have fished in Coquet to St Mary's in 2019.

Therefore, the inferred **maximum** frequency of activity (through analysis of one year of permit returns data) that occurs within the site is 6 vessels fishing an average of 8 days per month for an average 5 months per year. This equates to 40 trips per vessel per year which may fall into in Coquet to St Mary's MCZ. NIFCA has low-medium confidence in this estimate of fishing activity, with activity within the MCZ likely to be lower. This information provides details of activity but does not allow effort to be quantified.

3.3.2 Dredges (scallop dredge)

The main data source used to generate this information were NIFCA sightings data, NIFCA permit returns (permit returns for byelaw one were only implemented as a permit condition in 2019 and therefore there is only one year of data available for analysis) and VMS data.

To fish using a scallop dredge within the NIFCA district, fishers must obtain a dredge permit (NIFCA Byelaw 2). There were 8 registered dredge permit holders in 2019, which has increased since 2018, but there has been an overall decline since 2016 (Table 12).

Table 12 The number of vessels with a NIFCA Byelaw 2 Dredging permit from 2016-2019.

Year	Number of permit holders
2016	12
2017	7
2018	5
2019	8

Byelaw 2 also places restrictions on gear, those fishing within the district must not fish a dredge with a mouth exceeding 75 cm and can fish up to 10 dredges at any one time.

All permits issued in 2019 were registered to visiting fishing vessels, and no local vessels applied for permits. All vessels are between 9 and 15 m in length. Scallop dredging activity occurs primarily in the North of the district at around 4-6 miles offshore. Scallop dredging was not observed within Coquet to St Mary's MCZ in 2018 but has occurred on an infrequent basis in previous years, with two sighting recorded in 2016 (Figure 4).

There is potential for scallop dredgers to prosecute grounds of suitable habitat, coarse sediment/gravel, within the site. As part of the scallop licences, fishers have a set number of days at scallop areas. Once they have exceeded this, they move to other areas. While the scallop beds within the Northumberland IFCA district are thought to be less productive and/or less accessible than elsewhere around the UK, fishers will dredge here when limits on other places have been exceeded.

As a condition of the Byelaw 2 permit, fishers must fill in monthly catch returns forms detailing the weight of landed species, number of days fished, and area fished. No one has indicated fishing in the 0-3 nautical mile inner area of the district and therefore within Coquet to St Mary's MCZ. The evidence suggests that no scallop dredging has taken place in the site since 2016 (NIFCA has high confidence in this conclusion).

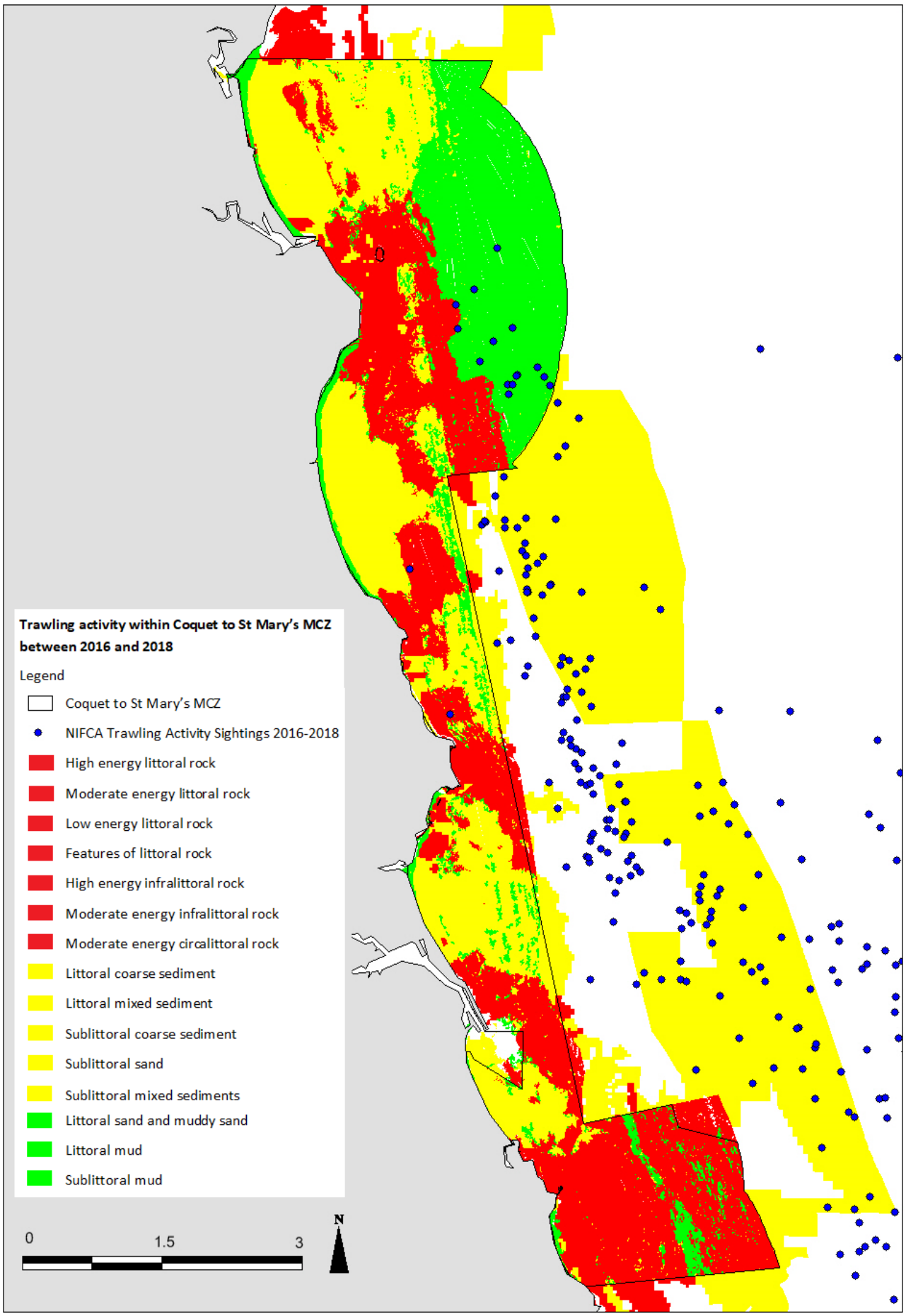

Figure 3 Trawling activity within Coquet to St Mary's MCZ between 2016 and 2018 in relation to Broad Scale Habitats.

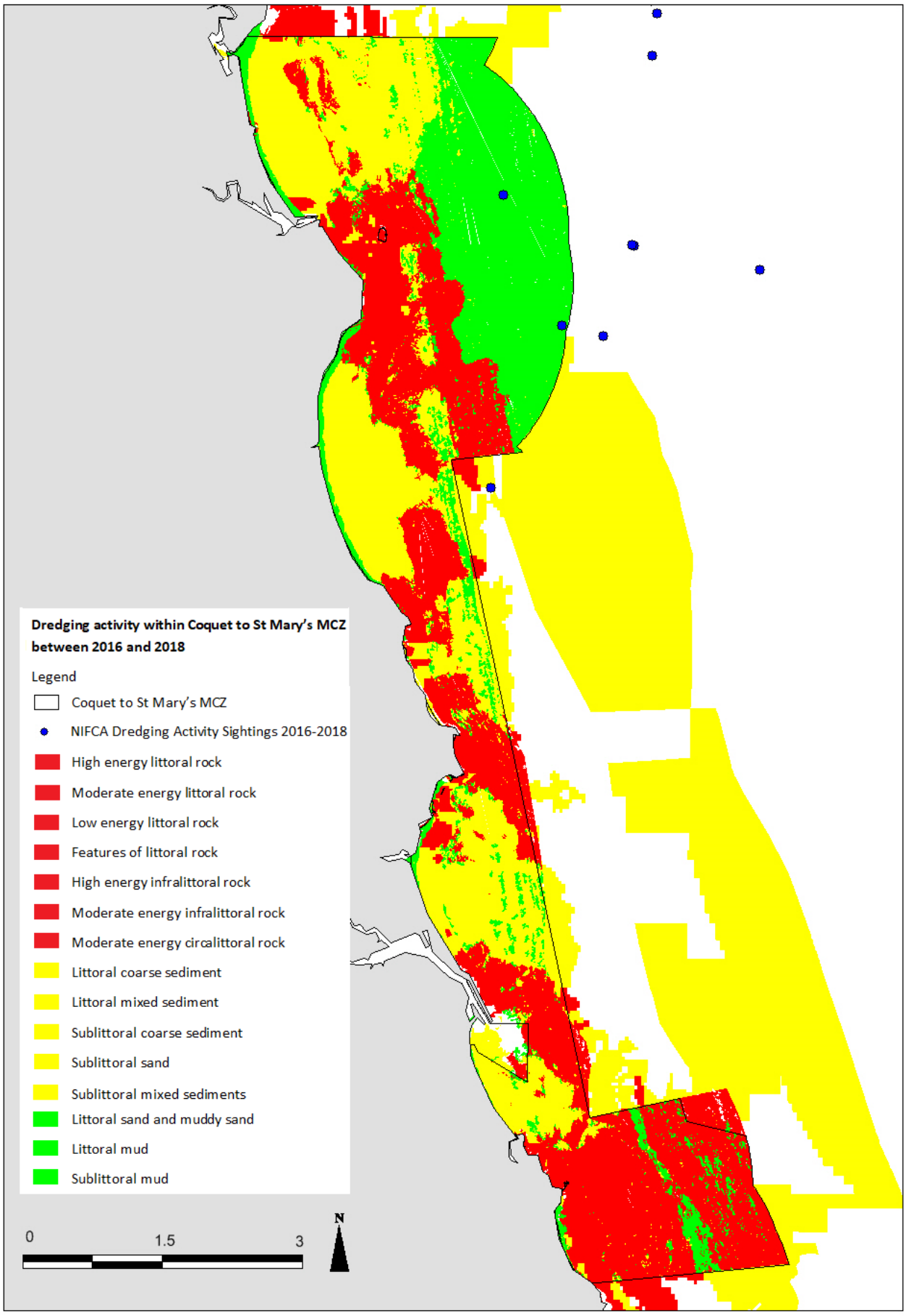

Figure 4 Dredging activity within Coquet to St Mary's MCZ between 2016 and 2018 in relation to Broad Scale Habitats.

3.4 [Pressure 1] Abrasion/disturbance of seabed surface substrate and Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion

Circalittoral rock communities may have a wide range of sensitivities to different fishing pressure depending on seabed topography, depth and tidal strength. This feature consists of open bedrock, shallow sloping reefs, rocky outcrops, gullies and ledges that supports a wide range of species including faunal turf, anthozoans, bryozoans and hydroids as well as invertebrate communities (Natural England Conservation Advice, 2019).

Studies looking at the interaction and impacts of mobile gear on rocky substrata are scarce and many focus on the interaction between bottom towed and softer sediment habitats. The best available evidence in the scientific literature have been combined with local data and knowledge to reach the conclusions outlined below.

Fishing with bottom towed gear can cause epibenthic species to dislodge by abrasion/disturbance caused by gear in contact with the seabed, movement of gear on the seabed and recovery of gear (Coleman et al., 2013). Due to the sensitivity of the gear/feature interaction, passing bottom gear (such as heavy trawl gear with rock hoppers attached or scallop dredges) a single pass may be enough to impact the biotopes associated with the above features (Kaiser et al., 2006). Towing fishing gear across rocky substrates is likely to cause damage or death of attached species (Engel and Kvitek, 1998; Lokkeborg 2005), and reduce habitat complexity as boulders and cobbles associated with the hard substrate are moved around (Freese et al., 1999). Recovery times for impacted habitat are likely to be longer than for soft substrates (Foden et al., 2010).

3.4.1 Otter trawls

Towing trawls across rocky substrates will cause damage or death to a significant amount of upright attached species such as corals and sponges (Lokkeborg 2005). A study of the short-term impacts of bottom trawling on hard habitats in the eastern Gulf of Alaska found displacement of boulders and removal or damage of large epifaunal invertebrates (Freese et al., 1999). Freese et al. (1999) also recorded a significant decrease in density to sponges and anthozoans in trawled areas compared to reference transects with 67% of sponges damaged during a single trawl pass. Hall-Spencer et al. (2002) describe impacts to cold water coral species including bycatch in trawl nets. Other studies have described impacts on hydroids, anemones, bryozoans, tunicates and echinoderms, which are vulnerable to mobile fishing gear (McConnaughey et al, 2008; Sewell and Hiscock, 2005). Habitat complexity may also be reduced as boulders and cobbles are moved around which has implications from reef associated species (Engel and Kvitek, 2008, Freese et al., 1999).

Recovery rates from impacts described above vary based on a number of factors including the frequency of tows, exposure, habitat hardness, water temperature and depth (Van Dolah et al., 1987; Freese et al., 2001; Foden et al., 2011). Foden et al. (2011) estimated seabed habitat sensitivity to different anthropogenic activities by determining recovery rates of the benthic community following cessation of an activity and found that the response of the benthic community to all human activity was found to be strongly dependent on the type of receiving habitat, with recovery rates of seabed habitats generally increased with sediment hardness i.e. habitats required a longer period to recover. Circalittoral rocky reef is hard habitat made up of boulders, cobbles, and bedrock, recovery time for associated biota (characterised as having occurred when abundance, species richness or biomass of benthic biota was equivalent to a 20% reduction in the pre-impact value) would be higher than for soft sediment habitats. The gear/habitat interactions that

were least likely to have recovered between exploitation activities include otter trawling on reef (Foden et al., 2011).

This evidence is not compatible with the conservation objective to maintain the surface and structural complexity of reef structure or to maintain the presence and distribution of circalittoral rock communities and the species composition of component communities.

Otter trawling occurs within Coquet to St Mary's MCZ. Using the available evidence: NIFCA sightings data and liaison with the fishing industry, NIFCA have moderate confidence in the assessment of the level of trawling activity within the site (see section 3.3.1) but cannot infer effort with confidence. The light otter trawl fishery targets Nephrops on the muddy habitat of the site. It does not target bedrock reef or cobble and boulder (stony reef) features, rather actively seeks to avoid these areas due to risks to gear and vessel. However, when working in the muddy habitat next to the reef feature, it is possible that fishing gear could make accidental and limited contact with bedrock or boulders and cobbles at the edge of the bedrock reef features.

However, NIFCA evidence generated through NIFCA sightings data and through liaising with the local industry suggests the trawling does occur using rockhopper gear on, or in close proximity to, reef features (Figure 3), although rarely. NIFCA have moderate-high confidence in this inference. Rockhopper gear is designed to bounce over rocky habitat with extant biotopes and reduce damage to the net (Seafish, 2019). This interaction is likely to cause damage to biota (see refs above). Defra's commissioned review of fisheries and SAC/SPA features by Cefas has categorised this as "Red Risk" feature x fishery interaction.

Light otter trawling is unlikely to occur on rocky reef due to the damage it would cause to gear, since without rockhoppers the gear would get snagged on rocks and would have to be recovered (Seafish, 2019) therefore this activity is not viable i.e. .fishers operating with light gear will not fish on reef. NIFCA have a high confidence in the non-viability of the interaction of light otter trawl gear on rocky reef (please see section 3.2.1 for a description of light otter trawl gear).

Much of Coquet to St Mary's MCZ is exposed to moderate-high energy conditions and strong tidal streams suggesting habitats and communities more robust and less sensitive to external pressures. The biotopes present in the site reflect this hydrodynamic nature such as *Alcyonium digitatum* dominated communities and a lack of highly branched corals such as the pink sea fan *Eunicella verrucosa.* Fishers prosecuting the MCZ know the area well, with years of experience trawling their target area(s) and will therefore avoid known reef areas/edges when using light otter trawl gear. They may accidentally come into contact with reef if, due to the dynamic nature of the area, bedrock reef is uncovered. However, these 'new' areas of rocky reef formed will have little or no biotopes developed in the period since uncovered, which can be impacted. Fishers will make note of changes to areas and avoid them in the future. Therefore, the interaction will be very rare and the impacts to any 'new' bare reef area will be low. NIFCA has moderate-high confidence that light otter trawl gear will not have significant adverse impacts to protected rocky reef.

NIFCA concludes, with moderate-high confidence, that there may be a potential risk of abrasion from heavy otter trawls (with rockhoppers) hindering the achievement of the conservation objectives stated for this MCZ for the subtidal rock features. We have moderate-high confidence in that light otter trawl activity will not impact reef features in the site.

3.4.2 Scallop dredge

Scallop dredging is described as being one of the most damaging fishing practices to seabed habitats. Boulcott and Howell (2011) conducted a photographic survey of four experimental tows over rocky reef in

south-west Scottish waters. They found characteristic dredge damage at all study sites, with vulnerable epifaunal species exhibiting physical damage. The greatest damage was recorded on previously unfished areas. Lambert et al. (2012) quantified the loss of epifaunal biomass due to scallop dredging impact of an entire fleet around the Isle of Man. On hard substrata, they found that dredging frequency had a negative impact on total biomass and maximum size of the largest organism found in each taxon. When compared with other impacts (tidal velocity and wave stress), fishing frequency was the most important factor that affected the maximum size of epifauna. The epifauna create habitat structure that is used by juvenile scallops and other species, thus providing an important ecosystem service (Lambert et al., 2012).

When comparing fished and unfished areas of temperate stony reef habitat, Hinz et al. (2011) found that sessile epifaunal species had significantly lower occurrences and abundances at fished sites compared to unfished sites. Commercially important mobile species such as scallops and crabs in the study were found not to be significantly affected by fishing (Hinz et al., 2011), However, abundance of all the species combined was on average 29% lower in fished sites compared to non-fished sites. Reductions in the abundance, presence and size of benthic fauna in relation to scallop dredging have been shown in other studies conducted on biogenic/gravel habitats (e.g. Collie et al. 1997, Hill et al. 1999, Kaiser et al. 2000, Kenchington et al. 2007).

Towed dredges may also modify and homogenise the substrate (Attrill et al., 2011) caused by moving and rolling boulders (Hall-Spencer and Moore, 2000) which can reduce habitat complexity. Habitats subject to scallop dredge pressure have been found to require a longer period of recovery compared with other gear interactions (otter or beam trawling) (Foden et al., 2011).

In areas that are topographically complex, the fishing efficiency of the scallop dredge gear is reduced and therefore the impacts on epifaunal species are also reduced (Hinz et al., 2011; Lambert et al., 2012). This may provide some protection to epifaunal species at low fishing intensities. However, the impacts described above, sustained even with minimal scallop dredging activity, would not be compatible with the conservation objective targets of the site. Namely, to maintain the presence and distribution of circalittoral rock communities; and, maintain the species composition of component communities.

This evidence is not compatible with the conservation objective to maintain the surface and structural complexity of reef structure or to maintain the presence and distribution of circalittoral rock communities and the species composition of component communities.

Evidence suggests that dredging activity is low-none, with two sightings of one vessel fishing within the MCZ in 2016, with the appropriate caveats of using sightings data for this purpose (see Section 1, section 1.4.2). Overall, this describes a very small footprint over the above features, although the impact if the interaction were to occur would be high. Defra’s commissioned review of fisheries and SAC and SPA features by Cefas has categorised this as “Red Risk” feature x fishery interaction..

NIFCA concludes, with moderate-high confidence, that there may be a potential risk of abrasion from bottom towed gear hindering the achievement of the conservation objectives stated for this MCZ for the subtidal rock features.

3.5 [Pressure 2] Removal of non-target species

Removal of target and non-target species can potentially have a significant impact on the species composition from larger long-lived species to smaller short-lived species (Schratzberger et al 2002, Queiros et al 2006). By-catch of fish species and molluscs may have an impact on the structure and function of

benthic communities (Jennings and Kaiser 1998; Kaiser et al 2006). Research suggests the impacts on protected features are greater for mobile gears than static gears (Kaiser et al., 2006).

The impacts of abrasion pressure on circalittoral rocky reef is largely determined by changes in seabed communities e.g. loss of fragile epifauna with corresponding changes in biotope composition. Thus, given the conclusions outlined in 4.2 for bottom towed gear, the physical effects of fishing gear on seabed communities with regard to the removal of non-target species, which are components of circalittoral and infralittoral rocky reef biotopes, has been addressed. Biotopes consist of sessile organisms and algae, mobile species generally do not form part of this assessment process likely due to the difficulty in monitoring mobile species.

Change in habitats and degradation of habitats have been shown to affect species diversity (Lambert et al., 2012). There is a lack of local research in the marine environment which means we have a poorer understanding of the impacts of this pressure on non-target species, especially mobile, which are not part of a biotope.

The lack of information on the impacts of mobile species makes drawing a conclusion difficult. NIFCA concludes, with moderate-high confidence, that there may be a potential risk of removal of sessile and floristic non-target species from bottom towed gear hindering the achievement of the conservation objectives stated for this MCZ for the subtidal rock features if there is an interaction (i.e. if rockhopper gear is used). If light otter trawl gear is used there will be little or no interaction on the feature therefore no removal of non-target species.

3.6 [Pressure 3] Smothering and siltation changes (Light) and Changes in suspended solids (water quality).

Towed gears will generate a plume of suspended sediment as the gear is pulled across the seabed. The amount of material brought into suspension is dependent on the gear being used and the makeup of the seabed (O'Neill and Summerbell, 2011). Heavy components of the gear, such as the doors of an otter trawl or the shoes of a beam trawl, will penetrate in the seabed and create a furrow by pushing aside the sediment and causing sediment to be entrained into the water column (Schwinghamer et al., 1996; Depestele et al., 2016; O'Neill and Ivanovic, 2016). If suspended sediment is adjacent to rocky reefs. This plume could settle out onto reefs with potential adverse impacts to reef communities. Dale et al. (2011) investigated the sediment remobilized by mobile gear (scallop dredges) in a highly dispersive environment in the West of Scotland and predict that the principle risk to reef habitats is from settling sand particles when dredge tracks approach within tens of metres of a reef.

Given the hydrodynamics of the area, there are moderate-high levels of natural redistribution of sediment in the inshore area off the North East England coast (Stephenson, 2016), thus communities are likely adapted to some sediment redistribution.

3.6.1 Otter trawl

Bottom trawls will mobilise sediment in the wake of the gear (De Madron et al., 2005; Lucchetti and Sala, 2012). O'Neill and Summerbell (2011) quantified the amount of mobilised sediment in the wake of an otter trawl on different substrate types. They found that the amount of sedimentation depended on the hydrodynamic drag of the gear and substrate type. The greater the drag and the finer the sediment, the greater the amount of sand remobilised. The study shows that gear with rockhoppers creates more hydrodynamic drag and therefore produces around 4 times the amount of suspended sediment in muddy sand than that of gear with small rubber discs only (19.1 kg m^{-1} and 5.9 kg m^{-1}), respectively.

Szotek et al. (2017) developed a tool to quantify habitat impacts (including seabed penetration depth and benthic community depletion) for a range of bottom towed gears. Otter trawl gear (without rockhoppers) was found not to penetrate the seabed as deep as other gears, which reduced its hydrodynamic drag and therefore amount of sediment particles entrained into the water column (Szotek et al., 2017; O'Neill and Summerbell, 2011). Habitat maps (Fig 7, Fig 8) suggests the soft sediment adjacent to rocky reef features in the main area targeted by trawlers is mud, Szotek et al. (2017) found that penetration depth of otter trawl gear was lowest on subtidal mud, again reducing the hydrodynamic drag and the amount of sediment resuspension.

Adverse impacts to rocky reef communities comes from the settlement of resuspended sediment onto reef habitats and communities (Dale et al., 2011). As O'Neill and Summerbell (2011) and Stotek (2017) indicate the use of lighter gear will cause less sediment to be redistributed due to less hydrodynamic drag than if rock hoppers were used on the site. This settling of resuspended sediment from light otter trawl gear may still impact reef communities, however due to the hydrodynamics of the area making it a highly dispersive environment, the impacts from additional sediment settling on the reef is unlikely to be significant.

NIFCA concludes with moderate confidence that there will not be a significant impact from light otter trawls.

3.6.2 Scallop dredging

Due to the way scallop dredges fish and interact with the bottom, they have been shown to have more of an impact on sediment resuspension (Lucchetti and Sala, 2012). As described in section 3.2.2 scallop dredges have teeth along a bar behind which is a mat of steel rings to which a heavy netting cover is attached to form a bag. This is typically fished in two bars towed from either side of the vessel, with up to 5 dredges attached to each. The teeth and the bag parts of the gear come into contact with the seabed to loosen and mobilise the sediment (Lucchetti and Sala, 2012). O'Neill et al. (2008) calculated the amount of sediment resuspended by a typical scallop dredger fishing 8 dredge per side (NIFCA byelaw 2 restricts the number of dredges to 5 per side within the NIFCA district). They calculated around 13.6 kg of sediment would be entrained into the water column per metre of seabed towed.

Mobilised sediment is resuspended in the water column where it is transported and can settle out elsewhere (O'Neill and Ivanovic, 2016). The principal sedimentary risk to reef habitats is predicted to come from settling sand particles when dredge tracks approach within tens of metres of a reef (Dale et al., 2011). There have been concerns raised about scallop dredging in the Firth of Lorne in Scotland where mobilisation of sediment may resettle and smother benthic species on nearby rocky and cobble reefs (O'Neil et al., 2013). The cumulative effect of dredging at the relatively low intensities recorded in this region is not expected to have a significant long-term impact on suspended silt concentrations and settlement in this highly dispersive environment (Dale et al., 2011).

Scallop dredging activity in the site is inferred to be low-to-none based on activity data, see section 1 for appropriate caveats. While sediment resuspension due to activity occurs, it is likely significantly less than natural resuspension from hydrodynamic forces. Sediment resuspension by natural forcing has been found to be more dominant than anthropogenic disturbance (i.e. from otter trawl fishing) (Mengual et al., 2016).

NIFCA concludes, with moderate confidence, that there is not a potential risk of smothering and siltation changes and changes in suspended solids from scallop dredge hindering the achievement of the conservation objectives stated for this MCZ for the subtidal rock features at current activity

levels. However, if scallop dredging activity were to increase in the site there is a risk that this interaction could hinder the conservation objectives.

3.7 Pressures conclusion

There may be a risk that bottom towed gear could hinder the conservation objectives of the site through abrasion and disturbance and removal of non-target species. While the evidence describes a small footprint over the above features, if the interaction were to occur the impact would be significant as the evidence in scientific literature suggests poor recoverability (red risk feature-fishery interaction). Table 13 summaries the conclusions of the above assessment of the pressures from demersal trawls and scallop dredged on protected features and gives a confidence in the conclusions.

Table 13 Summary of pressures assessment

Pressure	Interest feature	Favourable condition target	Activity	Compatible with conservation objectives?	Confidence
Abrasion and disturbance	High energy infralittoral rock And Moderate energy infralittoral rock And Moderate energy circalittoral rock	Maintain the presence and spatial distribution of rock communities.	Demersal trawl And Towed dredges	N	Moderate-High
		Maintain the surface and structural complexity, and the stability of the reef structure.		N	
		Maintain the species composition of component communities.		N	
Removal of non-target species	High energy infralittoral rock And Moderate energy infralittoral rock And Moderate energy circalittoral rock	Maintain the presence and spatial distribution of rock communities.	Demersal trawl And Towed dredges	N	Moderate-High
		Maintain the species composition of component communities.		N	
Smothering and siltation changes (Light) And	High energy infralittoral rock And	Maintain the presence and spatial distribution of rock communities.	Demersal trawl And Towed dredges	Y	Moderate

Changes in suspended solids (water quality).	Moderate energy infralittoral rock And Moderate energy circalittoral rock	Maintain the species composition of component communities.		Y	

3.8 Fisheries management measures

Significant risk to the site's conservation objectives from dredging and rockhopper gear across the infralittoral and subtidal reefs (various types) in parts of the site, to which this assessment applies, cannot be ruled out.

Therefore, fisheries management measures will be introduced by the appropriate regulators (Northumberland IFCA) to ensure that these fishing activities are excluded from this part of the site. Section 5 contains further details of these measures.

3.9 Part B conclusion (fishing alone)

The preceding sections have demonstrated that the use of light otter gear only in the site will prevent significantly reduce the rocky reef mobile gear interaction compared to other mobile gear types. A proposed management measure is therefore to restrict the use of mobile gear to light otter trawl only in the site.

NIFCA concludes, taking into account the future introduction of management measures for bottom towed fishing gear outlined in Section 5 (only using light otter gear), that the fishing activities assessed, alone, will not pose a significant risk to the conservation objectives of Coquet to St Mary's MCZ.

4. In-combination Assessment

Light otter mobile gear fishing methods are deemed to have no likely significant effect on reefs within the Coquet to St Mary's MCZ since light otter gear do not interact with reef (section 3.3.1). Therefore, it is unlikely, that there will be light otter gear activity occurring in in-combination with other activities on the reef (concluded with high confidence). Potential risks of in-combination effects have been considered in Table 14 listing current and possible plans and projects and other activities within the site. Other bottom-towed mobile gear e.g. dredges, have not been considered in this in-combination assessment since they have been shown to hinder the conservation objectives of the site, and management is to be put in place to prevent future activity (Section 5).

In summary, light otter gear trawling within Coquet to St Mary's MCZ is not deemed to have a likely significant effect on reefs alone OR in-combination with other plans/projects.

Table 14. In-combination assessments of light otter trawling with other plans and projects within and around Coquet to St Mary's MCZ occurring on reef types.

Plans and Projects			
Activity	**Description**	**Assessment**	**Potential Pressure**
Fishing x Fishing	Potting Static netting	Activities are unlikely to co-occur on reef features.	Fisheries permitted by NIFCA. Potting is the main fishery throughout the district with 95 commercial permit holders 2019, of which 28 reported operating within Coquet to St Mary's MCZ. No adverse effect at current levels, but potential for increase vessel activity and disturbance levels within the Coquet to St Mary's MCZ. Fishing effort will be continually monitored and assessed with the implementation of Monitoring and Control Plans for Static Netting and Potting. All vessels known to use static nets are shellfish permit holders and are therefore part of the same potting fleet. Netting in the NIFCA district is low, with 1 netting sightings in the district in 2019. Netting is mainly targeted over stony ground with avoidance of rocky reef areas where nets are at risk of becoming snagged.
Fishing x Fishing	T & J and Drift Nets	Activities are unlikely to co-occur on reef features.	This fishery operates from March through to June and targets migratory species. This was primarily salmon; however, the Environment Agency have prohibited landing salmon and

			so sea trout is the main target species. All fishermen must gain a license to fish from the Environment Agency, who are responsible for regulating this fishery. Currently there are 21 T and J nets licensees (2 combined) and 8 drift net licensees across our district. Fishing effort will be continually monitored and assessed with the implementation of Monitoring and Control Plans for Static Netting. Low risk to pressure at current levels.
Coastal Infrastructure	Outflow pipes Maintenance	Appropriate licence conditions/monitoring has been incorporated to mitigate any impacts.	Small scale – low number of outfall pipes on reefs along the Northumberland Coast.
Anchorage and Mooring	Anchorage and Mooring	Fishers do not generally anchor, and any port anchorages are typically on sediment not on reefs. Low risk to pressure at current levels.	Several moorings and anchorage sites occur within Coquet to St Mary's and in the surrounding waters. Most of these sites are historical anchorages/moorings and are not or infrequently used at present. The main authorised industrial anchorage sites occur outside of the boundary of Coquet to St Mary's MCZ and are managed by the Port of Blyth and the Port of Tyne.
Harbour dredging [vicinity of MCZ]	Harbour dredging	Appropriate licence conditions/monitoring has been incorporated to mitigate any impacts of harbour dredging.	Small scale harbour dredging occurs; however, no commercial fishing occurs within harbours.
Coastal management scheme - Northumberland and North Tyneside Shoreline Management Plan 2 (05/2009) covers the coastline from the Scottish border to the River Tyne.	Flood and erosion risk management	As stated in Section (2) of the document projects and plans within the SMP are subjected to its own Appropriate Assessment for proposed work, which assesses any impacts to Coquet to St Mary's MCZ.	Any coastal management works along the coast under the aegis of a Coastal Management Scheme.
Cable laying/infrastructure	Subsea cables	Appropriate licence conditions/monitoring	Any subsea cables along the coast relating to the relevant

		has been incorporated to mitigate any impacts. Plans or projects must obtain a marine licence which must assess impacts to reef features within Coquet to St Mary's MCZ.	plan or projects under Marine and Coastal Access Act.
Other activities being considered (which are not plans or projects by definition)			
Activity	**Description**	**Assessment**	**Potential Pressure**
Recreational Angling from Vessels	NIFCA record sightings of angling vessels observed during patrols since 2001. This data was provided to the MMO MCSS MPA activity monitoring trial (begin September 2016).	There is low to no interaction with the seabed from this activity. Additionally, boats prefer to anchor on sediment than reef so unlikely to be co-located mobile gear.	Recreational angling activity is moderate in the district with 132 sightings of recreational angling vessels in 2019.
Recreational Potting	In 2016 NIFCA introduced a recreational potting permit which will enable NIFCA to monitor levels of recreational potting within the district. Each permit holders is permitted to fish up to 5 pots within the NIFCA district and can only take 2 lobster (5 brown or velvet crabs, 20 whelks or 5 prawns) per day. In 2019 there were 204 recreational permit holders.	A significant proportion of recreational pots are fished within the intertidal zone from the shore therefore there is no overlap with commercial trawling. Recreational potting is often seasonal and carried out infrequently. Fishing effort will be continually monitored and assessed with the implementation of the Potting Monitoring and Control Plan and Shellfish Fisheries Management Plans.	This activity is small scale in comparison to commercial potting activity. In 2019, NIFCA had 204 registered recreational potting permit holders, as each permit holder is only allowed a maximum of 5 pots this results in a total of 1,020 pots.
Yachting, sailing, motor cruises	Currently activity levels unknown. NIFCA participated in MMO MCSS MPA activity monitoring trial which began in September 2016.	Activity will not come into contact with subtidal rocky reef.	Increase of vessel activity and disturbance levels within Coquet to St Mary's MCZ. There is potential for a disturbance effect on classified birds and designated seals when wildlife watching boats and visitors around Coquet Island during summer months. However, boats operating out of the port of Amble should adhere to the 'Northumberland Wildlife Watching Boating Code of Conduct', designed to minimise

			disturbance to the colonies on the Coquet Island. The National Trust manages the site.
Other activities with potential to occur but don't occur [list cannot be exhaustive/obvious suspects]			
Activity	**Description**	**Assessment**	**Potential Pressure**
Aggregate Dredging	Aggregates dredge	Activities do not occur together	No dredging in vicinity
Windfarm	Platform build/infrastructure, Cables laying /infrastructure Cable repair	Appropriate licence conditions/monitoring has been incorporated to mitigate any impacts. Low risk of physical loss, damage or biological disturbance.	There are currently no windfarms within Coquet to St Mary's MCZ with 5 turbines located 1 km east of the site boundary.

5. Conclusion

5.1 Assessment Result for Mobile Gear (Scallop dredging, Rockhopper Gear, Light Otter Trawl)

5.1.1 Fishing alone

NIFCA consider that there is a pathway for impacts on the MCZ through abrasion and disturbance, and removal of non-target species (see Section 3.1). Scallop dredging and rockhopper gear moving along the bottom, alone, is sufficient to affect (other than insignificantly) some features of the site. Namely, infralittoral rocky reef, circalittoral rocky reef however, light otter trawl gear will not as the interaction with these features will not occur.

5.1.2 In-combination

As with the assessment of fishing alone in Section 3.1 and the in-combination assessment in Section 4 this section assumes that management for bottom towed gear will be introduced. NIFCA consider that whilst there is a pathway for disturbance, this is not sufficient to affect (other than insignificantly) the features of the site from the following in-combination factors, if only light otter gear is used:

- All fishing gear on all pressures combined
- All fishing gear on all pressures combined in relation to both existing licenced activity within the site

5.2 Proposed Management

NIFCA have considered a range of management options based on the conclusion of this assessment:

Option 1: Nothing is required.

Option 2: No additional management is foreseen. Introduce a monitoring and control plan within the site to document fishing effort.

Option 3: Reduce/limit pressures. Due to the potential impacts of bottom towed gears on the sub-tidal reef features, gear restriction management will be introduced to stop the interaction to ensure the achievement of the conservation objectives. A limit on the number of bottom towed vessels will be introduced to ensure fishing levels are maintained at current levels.

Option 4: Remove/avoid pressures (site closures). Prohibit bottom contacting towed gears in all areas of the site.

NIFCA has ascertained that, due to the significant risk to the site's conservation objectives from fishing with gears that trawl or dredge the seabed, current management is not sufficient to protect Coquet to St Mary's MCZ.

As such, the implementation of a combination of Option 3 and Option 4 will be required to best further the conservation objectives of the site. Option 3 for otter trawls and Option 4 for scallop dredges. Therefore, the following management measure will be introduced:

- Changes to a NIFCA byelaw (Byelaw 1) to restrict otter trawl gear in the site to specified gear (light ground) only and to limit the number of vessels to current levels.
- Changes to a NIFCA byelaw (Byelaw 2) to prohibit scallop dredging in the NIFCA district.

NIFCA has moderate to high confidence that the restrictions on trawling will ensure activity does not hinder the achievement of the conservation objectives stated for this MCZ (refer to Section 3.1, section 3.4.1). NIFCA has high confidence that the restrictions on dredging will ensure activity does not hinder the achievement of the conservation objectives stated for this MCZ (refer to Section 3.1, section 3.4.2).

This decision has been made in accordance with the Marine Policy Statement (MPS). Specifically:

Section 2.6:

2.6.1.1 Marine plan authorities should be mindful that, consistent with the high-level marine objectives, the UK aims to ensure:

- A halting and, if possible, a reversal of biodiversity loss with species and habitats operating as a part of healthy, functioning ecosystems

2.6.1.6 Many individual wildlife species receive statutory protection under a range of legislative provisions. Other species and habitats have been identified as being of principal importance for the conservation of biodiversity in the UK and thereby requiring conservation action or are subject to recommended conservation actions by an appropriate international organisation. Priority marine features are being defined in the seas around Scotland. The marine plan authority should ensure that development does not result in a significant adverse effect on the conservation of habitats or the populations of species of conservation concern and that wildlife species and habitats enjoying statutory protection are protected from the adverse effects of development in accordance with applicable legislation.

3.8.8 Fishing can have negative environmental impacts. As well as over-exploitation of commercial fish stocks, this can include threats to vulnerable or rare species, including by-catch, and can cause extensive damage or destruction to habitats and the historic environment. Such impacts can often be associated with particular gear types and the intensity of fishing activity. Interactions between fishing activity and marine developments and their consequent impacts on fish stocks and the environment are complex and need to be considered. It should also be recognised that many fishing activities are compatible with other sea users.

5.3 Review of Assessment

To coordinate the collection and analysis of information regarding activity levels, and to ensure that any required management is implemented in a timely manner, a Trawling Monitoring and Control plan has been implemented.

NIFCA will review this assessment every year through the monitoring and control plans, into which these assessments feed, or more frequently if significant new information is received.
Such information could include:

- updated conservation advice;
- updated advice on the condition of the feature;
- significant change in activity levels.

5.4 Conclusion

NIFCA have had regard to best available evidence and through consultation with relevant advisors and the public, conclude that bottom towed fishing activities are not compatible with the conservation objectives and General Management Approach of this marine protected area with fishing effort at the current level. This will be addressed through the introduction of management measure discussed in section 5.2.

Has Natural England been formally consulted on this document (and do they agree)?	**Catherine L. Scott**

Date of document completion/signature:	**03/06/2020**

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Annex 1

All features have been listed in table 15 with all fishing activities. The 'Matrix gear type' column shows the categories used in the Matrix. These are matched to the 'aggregated method' categories used in Natural England conservation advice packages.

Table 15: Fishing activities with amber interactions to be included in this assessment if they take place.

Features	Matrix Gear Type	Natural England Aggregated Method
High energy intertidal rock	Pots/creels (crustacean/gastropods)	Traps
	Cuttle pots	
	Fish traps	
	Gill nets	Anchored nets/lines
	Trammel nets	
	Entangling nets	
	Demersal drift nets	
	Demersal longlines	
	Beach seines/ring nets	Seine nets and other
	Fyke and stake nets	
	Shrimp push-nets	
	Bait dragging	Miscellaneous
	Commercial diving	
High energy infralittoral rock	Beam trawl (whitefish)	Towed (demersal)
	Beam trawl (shrimp)	
	Beam trawl (pulse/wing)	
	Heavy otter trawl	
	Multi-rig trawls	
	Light otter trawl	
	Pair trawl	
	Anchor seine	
	Scottish/fly seine	
	Scallops	Dredges (towed)
	Mussels, clams, oysters	
	Hand working (access from vessel)	Intertidal handwork
	Hand work (access from land)	
	Pots/creels (crustacea/gastropods)	Traps
	Cuttle pots	
	Fish traps	
	Gill nets	Static – fixed nets
	Trammels	
	Entangling	
	Drift nets (demersal)	Passive - nets
	Longlines (demersal)	Lines
	Beach seines/ring nets	Seine nets and other
	Shrimp push-nets	
	Fyke and stakenets	
	Bait dragging	Miscellaneous
	Crab tiling	
	Digging with forks	Bait collection
Intertidal coarse sediment	Beam trawl (whitefish)	
	Beam trawl (shrimp)	
	Beam trawl (pulse/wing)	
	Heavy otter trawl	

	Multi-rig trawls	Towed (demersal)
	Light otter trawl	
	Pair trawl	
	Anchor seine	
	Scottish/fly seine	
	Scallops	Dredges (towed)
	Mussels, clams, oysters	
	Pump scoop (cockles, clams)	
	Suction (cockles)	Dredges (other)
	Tractor	
	Hand working (access from vessel)	Intertidal handwork
	Hand work (access from land)	
	Pots/creels (crustacea/gastropods)	Traps
	Cuttle pots	
	Fish traps	
	Gill nets	Static – fixed nets
	Trammels	
	Entangling	
	Drift nets (demersal)	Passive - nets
	Beach seines/ring nets	Seine nets and other
	Shrimp push-nets	
	Fyke and stakenets	
	Bait dragging	Miscellaneous
	Crab tiling	
	Digging with forks	Bait collection
Intertidal mixed sediments	Beam trawl (whitefish)	Towed (demersal)
	Beam trawl (shrimp)	
	Beam trawl (pulse/wing)	
	Heavy otter trawl	
	Multi-rig trawls	
	Light otter trawl	
	Pair trawl	
	Anchor seine	
	Scottish/fly seine	
	Scallops	Dredges (towed)
	Mussels, clams, oysters	
	Pump scoop (cockles, clams)	
	Suction (cockles)	Dredges (other)
	Tractor	
	Hand working (access from vessel)	Intertidal handwork
	Hand work (access from land)	
	Pots/creels (crustacea/gastropods)	Traps
	Cuttle pots	
	Fish traps	
	Gill nets	Static – fixed nets
	Trammels	
	Entangling	
	Drift nets (demersal)	Passive - nets
	Beach seines/ring nets	Seine nets and other
	Shrimp push-nets	
	Fyke and stakenets	
	Bait dragging	Miscellaneous

	Crab tiling	
	Digging wth forks	Bait collection
Intertidal mud	Beam trawl (whitefish)	Towed (demersal)
	Beam trawl (shrimp)	
	Beam trawl (pulse/wing)	
	Heavy otter trawl	
	Multi-rig trawls	
	Light otter trawl	
	Pair trawl	
	Anchor seine	
	Scottish/fly seine	
	Scallops	Dredges (towed)
	Mussels, clams, oysters	
	Pump scoop (cockles, clams)	
	Suction (cockles)	Dredges (other)
	Tractor	
	Hand working (access from vessel)	Intertidal handwork
	Hand work (access from land)	
	Pots/creels (crustacea/gastropods)	Traps
	Cuttle pots	
	Fish traps	
	Gill nets	Static – fixed nets
	Trammels	
	Entangling	
	Drift nets (demersal)	Passive - nets
	Beach seines/ring nets	Seine nets and other
	Shrimp push-nets	
	Fyke and stakenets	
	Bait dragging	Miscellaneous
	Crab tiling	
	Digging wth forks	Bait collection
Intertidal sand and muddy sand	Beam trawl (whitefish)	Towed (demersal)
	Beam trawl (shrimp)	
	Beam trawl (pulse/wing)	
	Heavy otter trawl	
	Multi-rig trawls	
	Light otter trawl	
	Pair trawl	
	Anchor seine	
	Scottish/fly seine	
	Scallops	Dredges (towed)
	Mussels, clams, oysters	
	Pump scoop (cockles, clams)	
	Suction (cockles)	Dredges (other)
	Tractor	
	Hand working (access from vessel)	Intertidal handwork
	Hand work (access from land)	
	Pots/creels (crustacea/gastropods)	Traps
	Cuttle pots	
	Fish traps	
	Gill nets	Static – fixed nets
	Trammels	

	Entangling	
	Drift nets (demersal)	Passive - nets
	Beach seines/ring nets	Seine nets and other
	Shrimp push-nets	
	Fyke and stakenets	
	Bait dragging	Miscellaneous
	Crab tiling	
	Digging with forks	Bait collection
Intertidal under boulder communities	Beam trawl (whitefish)	Towed (demersal)
	Beam trawl (shrimp)	
	Beam trawl (pulse/wing)	
	Heavy otter trawl	
	Multi-rig trawls	
	Light otter trawl	
	Pair trawl	
	Anchor seine	
	Scottish/fly seine	
	Scallops	Dredges (towed)
	Mussels, clams, oysters	
	Pump scoop (cockles, clams)	
	Hand working (access from vessel)	Intertidal handwork
	Hand work (access from land)	
	Pots/creels (crustacea/gastropods)	Traps
	Cuttle pots	
	Fish traps	
	Gill nets	Static – fixed nets
	Trammels	
	Entangling	
	Drift nets (demersal)	Passive - nets
	Longlines (demersal)	Lines
	Beach seines/ring nets	Seine nets and other
	Shrimp push-nets	
	Fyke and stakenets	
	Bait dragging	Miscellaneous
	Crab tiling	
	Digging with forks	Bait collection
Low energy intertidal rock	Beam trawl (whitefish)	Towed (demersal)
	Beam trawl (shrimp)	
	Beam trawl (pulse/wing)	
	Heavy otter trawl	
	Multi-rig trawls	
	Light otter trawl	
	Pair trawl	
	Anchor seine	
	Scottish/fly seine	
	Scallops	Dredges (towed)
	Mussels, clams, oysters	
	Pump scoop (cockles, clams)	
	Hand working (access from vessel)	Intertidal handwork
	Hand work (access from land)	
	Pots/creels (crustacea/gastropods)	Traps
	Cuttle pots	

	Fish traps	
	Gill nets	Static – fixed nets
	Trammels	
	Entangling	
	Drift nets (demersal)	Passive - nets
	Longlines (demersal)	Lines
	Beach seines/ring nets	Seine nets and other
	Shrimp push-nets	
	Fyke and stakenets	
	Bait dragging	Miscellaneous
	Crab tiling	
	Digging with forks	Bait collection
Moderate energy circalittoral rock	Beam trawl (whitefish)	Towed (demersal)
	Beam trawl (shrimp)	
	Beam trawl (pulse/wing)	
	Heavy otter trawl	
	Multi-rig trawls	
	Light otter trawl	
	Pair trawl	
	Anchor seine	
	Scottish/fly seine	
	Scallops	Dredges (towed)
	Mussels, clams, oysters	
	Pump scoop (cockles, clams)	
	Hand working (access from vessel)	Intertidal handwork
	Hand work (access from land)	
	Pots/creels (crustacea/gastropods)	Traps
	Cuttle pots	
	Fish traps	
	Gill nets	Static – fixed nets
	Trammels	
	Entangling	
	Drift nets (demersal)	Passive - nets
	Longlines (demersal)	Lines
	Beach seines/ring nets	Seine nets and other
	Shrimp push-nets	
	Fyke and stakenets	
	Bait dragging	Miscellaneous
	Crab tiling	
	Digging with forks	Bait collection
Moderate energy circalittoral rock	Pots/creels (crustacean/gastropods)	Traps
	Cuttle pots	
	Fish traps	
	Gill nets	Anchored nets/lines
	Trammel nets	
	Entangling nets	
	Demersal drift nets	
	Demersal longlines	
	Beach seines/ring nets	Seine nets and other
	Fyke and stake nets	
	Shrimp push-nets	
	Bait dragging	Miscellaneous

	Commercial diving	
Moderate energy infralittoral rock	Pots/creels (crustacean/gastropods)	Traps
	Cuttle pots	
	Fish traps	
	Gill nets	Anchored nets/lines
	Trammel nets	
	Entangling nets	
	Demersal drift nets	
	Demersal longlines	
	Beach seines/ring nets	Seine nets and other
	Fyke and stake nets	
	Shrimp push-nets	
	Bait dragging	Miscellaneous
	Commercial diving	
Moderate energy intertidal rock	Beam trawl (whitefish)	Towed (demersal)
	Beam trawl (shrimp)	
	Beam trawl (pulse/wing)	
	Heavy otter trawl	
	Multi-rig trawls	
	Light otter trawl	
	Pair trawl	
	Anchor seine	
	Scottish/fly seine	
	Scallops	Dredges (towed)
	Mussels, clams, oysters	
	Pump scoop (cockles, clams)	
	Hand working (access from vessel)	Intertidal handwork
	Hand work (access from land)	
	Pots/creels (crustacea/gastropods)	Traps
	Cuttle pots	
	Fish traps	
	Gill nets	Static – fixed nets
	Trammels	
	Entangling	
	Drift nets (demersal)	Passive - nets
	Longlines (demersal)	Lines
	Beach seines/ring nets	Seine nets and other
	Shrimp push-nets	
	Fyke and stakenets	
	Bait dragging	Miscellaneous
	Crab tiling	
	Digging with forks	Bait collection
Peat and clay exposures	Unknown	N/A
Subtidal coarse sediment	Beam trawl (whitefish)	Towed (demersal)
	Beam trawl (shrimp)	
	Beam trawl (pulse/wing)	
	Heavy otter trawl	
	Multi-rig trawls	
	Light otter trawl	
	Pair trawl	
	Anchor seine	
	Scottish/fly seine	

	Scallops	Dredges (towed)
	Mussels, clams, oysters	
	Pump scoop (cockles, clams)	
	Suction (cockles)	Dredges (other)
Subtidal mixed sediments	Beam trawl (whitefish)	Towed (demersal)
	Beam trawl (shrimp)	
	Beam trawl (pulse/wing)	
	Heavy otter trawl	
	Multi-rig trawls	
	Light otter trawl	
	Pair trawl	
	Anchor seine	
	Scottish/fly seine	
	Scallops	Dredges (towed)
	Mussels, clams, oysters	
	Pump scoop (cockles, clams)	
	Suction (cockles)	Dredges (other)
	Pots/creels (crustacea/gastropods)	Traps
	Cuttle pots	
	Fish traps	
	Gill nets	Static – fixed nets
	Trammels	
	Entangling	
	Drift nets (demersal)	Passive -nets
	Beach seines/ring nets	Seine nets and other
	Shrimp push-nets	
	Fyke and stakenets	
	Bait dragging	Miscellaneous
Subtidal mud	Beam trawl (whitefish)	Towed (demersal)
	Beam trawl (shrimp)	
	Beam trawl (pulse/wing)	
	Heavy otter trawl	
	Multi-rig trawls	
	Light otter trawl	
	Pair trawl	
	Anchor seine	
	Scottish/fly seine	
	Scallops	Dredges (towed)
	Mussels, clams, oysters	
	Pump scoop (cockles, clams)	
	Suction (cockles)	Dredges (other)
	Pots/creels (crustacea/gastropods)	Traps
	Cuttle pots	
	Fish traps	
	Gill nets	Static – fixed nets
	Trammels	
	Entangling	
	Drift nets (demersal)	Passive -nets
	Beach seines/ring nets	Seine nets and other
	Shrimp push-nets	
	Fyke and stakenets	
	Bait dragging	Miscellaneous

Subtidal sand	Beam trawl (whitefish)	Towed (demersal)
	Beam trawl (shrimp)	
	Beam trawl (pulse/wing)	
	Heavy otter trawl	
	Multi-rig trawls	
	Light otter trawl	
	Pair trawl	
	Anchor seine	
	Scottish/fly seine	
	Scallops	Dredges (towed)
	Mussels, clams, oysters	
	Pump scoop (cockles, clams)	
	Suction (cockles)	Dredges (other)