

Draft Fisheries Assessment – Norwegian Boundary Sediment Plain MPA

August 2024

Draft Fisheries Assessment – Norwegian Boundary Sediment Plain NCMPS

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Executive Summary

The scope of this fisheries assessment is the [Norwegian Boundary Sediment Plain Nature Conservation Marine Protected Area](#) (NCMPA), located to the east of Scotland, adjacent to the offshore limit of UK waters. The purpose of this assessment is to determine whether the current levels of fishing activity occurring within the site are compatible with the conservation objectives of the Norwegian Boundary Sediment Plain NCMPA. The protected features of the site are Ocean Quahog and Offshore subtidal sands and gravels as their supporting habitat and are considered to be in unfavourable condition. The conservation objective for the NCMPA is that the protected features so far as already in favourable condition, remain in such condition.

In Part A, fishing activities currently occurring within the site (data from 2015 – 2019) were screened and grouped into aggregated gear types. Throughout this draft fisheries assessment the data from 2015-2019 is referred to as the current levels of activity. The gear types considered relevant to the protected features were grouped into the aggregated gear types of demersal trawls and demersal seines. Based on the pressures associated with these fishing activities and the sensitivity of the protected features, the following pressures were identified as potentially being capable of affecting the protected features of the site: abrasion/disturbance of the substrate on the surface of the seabed, changes in suspended solids (water clarity), penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion, removal of non-target species and smothering and siltation rate changes (light). These pressures were taken through to Part B of the assessment.

In Part B, the assessment of fishing activities capable of affecting the protected features within the site determined that, at current fishing levels, demersal trawls and demersal seines would not hinder the conservation objectives for Norwegian Boundary Sediment Plain NCMPA.

However, when considering management options Scottish Ministers conclude that management measures should be proposed to restrict mobile demersal fishing within Norwegian Boundary Sediment NCMPA. The wider advice and evidence from JNCC show a risk of impact from other demersal gears which do not currently occur in the

site. Furthermore, the Norwegian Boundary Sediment Plain NCMPA contains an area which is considered to be least damaged, more natural. It was agreed at stakeholder workshops that areas in the northern part of the NCMPA should be given a higher level of protection to maintain that status and ensure mitigation against any future risk from either increased activity of existing fisheries or potential emerging fishing activities (beam trawls or dredges).

In Part C, the in-combination assessment considered the residual potential impacts of all fishing activity occurring within the site alongside other relevant offshore region activities happening in and near the site. Two oil and gas pipelines and one active well head overlapped with the site; however these were not deemed to be potential for in-combination effects. Therefore, Scottish Ministers concluded that the remaining fishing activities in-combination with other known activities would not hinder the achievement of the conservation objectives for Norwegian Boundary Sediment Plain NCMPA.

Considering Scottish Ministers conclusion of the need for management measures for mobile demersal gear, two management options have been identified and are under consideration:

- Zoned management would reduce/limit pressures within the site. Under this option 41% of the site would be closed to all demersal mobile gears, and 59% of the site would be open to demersal seines but closed to all other demersal mobile gear. Scottish Ministers consider that this management option would not hinder the achievement of the conservation objectives for Norwegian Boundary Sediment Plain NCMPA; rather it would further the achievement of said objectives.
- Full site exclusion of all demersal mobile gear across the whole site. Scottish Ministers consider that this management option would not hinder the conservation objectives for Norwegian Boundary Sediment Plain NCMPA; rather it would further the achievement of them.

The decision as to which management option is to be taken forward will be made following a statutory public consultation exercise and will be taken in the light of all relevant obligations incumbent upon the Scottish Ministers in relation to the exercise of their functions.

1. Introduction

1.1 Scope of the Norwegian Boundary Sediment Plain NCMPA assessment

The geographic scope of this assessment covers the whole of [Norwegian Boundary Sediment Plain NCMPA](#). The purpose of this assessment is to determine whether the current levels of fishing activity occurring within the site would or might hinder the conservation objectives of the Norwegian Boundary Sediment Plain NCMPA and to identify options for management measures.

In this assessment, Scottish Ministers use the best available evidence to review the site characteristics and current fishing activity (Part A), both taken alone and in

combination with other relevant activities (Part C) to determine if the fishing activities are capable of affecting the protected features (Ocean Quahog aggregations and Offshore subtidal sands and gravels). Any fishing activities capable of affecting the protected features either alone or in combination with other relevant activities are considered further to assess whether they would or might hinder the achievement of the conservation objectives (Part B).

Where there is the potential for the achievement of the conservation objectives to be hindered, fisheries management measures are identified for the site by the Scottish Ministers. These measures are considered in light of the conservation objectives, biological characteristics, current fishing and other activity levels and existing fisheries restrictions for Norwegian Boundary Sediment Plain NCMPA. A final decision on which measures, if any, are to be adopted, will follow upon a statutory consultation exercise and will take into account all relevant statutory obligations incumbent upon Scottish Ministers.

A methodology document has been prepared to aid understanding of these assessments.

1.2 Site description

The [Norwegian Boundary Sediment Plain NCMPA](#) (Figure 1) lies to the east of Scotland, adjacent to the offshore limit of UK waters. A sandy plain in relatively shallow waters, the site ranges in depth from 80 - 120 m below sea-level. The NCMPA is designated for Ocean quahog aggregations (including sands and gravels as their supporting habitat).

The Norwegian Boundary Sediment Plain NCMPA covers 164 km² and is home to a range of animals that live both in and on the sand and gravel habitats such as starfish, crabs, and the long-lived ocean quahog (*Arctica islandica*); the latter of which is considered to be [Threatened and/or Declining](#) across the North-east Atlantic by the OSPAR Commission. Ocean quahog filter food from passing currents and can use a shovel-like foot to bury into the sediment. They can burrow deep into the sediment to escape predators and live for long periods of time without food or oxygen.

Ocean quahog are documented as a potential food source for several species of fish including [cod](#). Although they are not specific to one type of habitat, sands and gravels are the ocean quahog's preferred habitat. The main threat to ocean quahog is disturbance of the seabed, most often from bottom fishing activities, but licensed activities, such as oil, gas and aggregate extraction, can also directly and indirectly affect this species.

Offshore subtidal sand and gravel habitats are also protected to support the protection of ocean quahog in the context of providing habitat suitable for ocean quahog colonisation. Ocean quahog are typically found buried in medium- to fine-grained sands, sandy mud and silty sand in water depths of 4–400 m. Survey data from this NCMPA have confirmed the presence of ocean quahog within the depth range and sediment types in which they are expected to occur.

The conservation objectives for the Norwegian Boundary Sediment Plain Nature Conservation Marine Protected Area (NCMPA) are that the protected features:

- so far as already in favourable condition, remain in such condition; and
- so far as not already in favourable condition, be brought into such condition, and remain in such condition.

[JNCC's view on the overall condition](#) of the site's qualifying features is that the features are in unfavourable condition.

With respect to the Ocean quahog aggregations (including supporting sedimentary habitats) within the NCMPA, this means that the quality and quantity of its habitat and the composition of its population in terms of number, age and sex ratio are such as to ensure that the population is maintained in numbers which enable it to thrive.

Any temporary reduction of numbers is to be disregarded if the population is sufficiently thriving and resilient to enable its recovery. Any alteration to that feature brought about entirely by natural processes is to be disregarded.

Further information regarding the designation and conservation objectives for the protected features of Norwegian Boundary Sediment Plain NCMPA is available on [the JNCC Norwegian Boundary Sediment Plain NCMPA webpage](#).

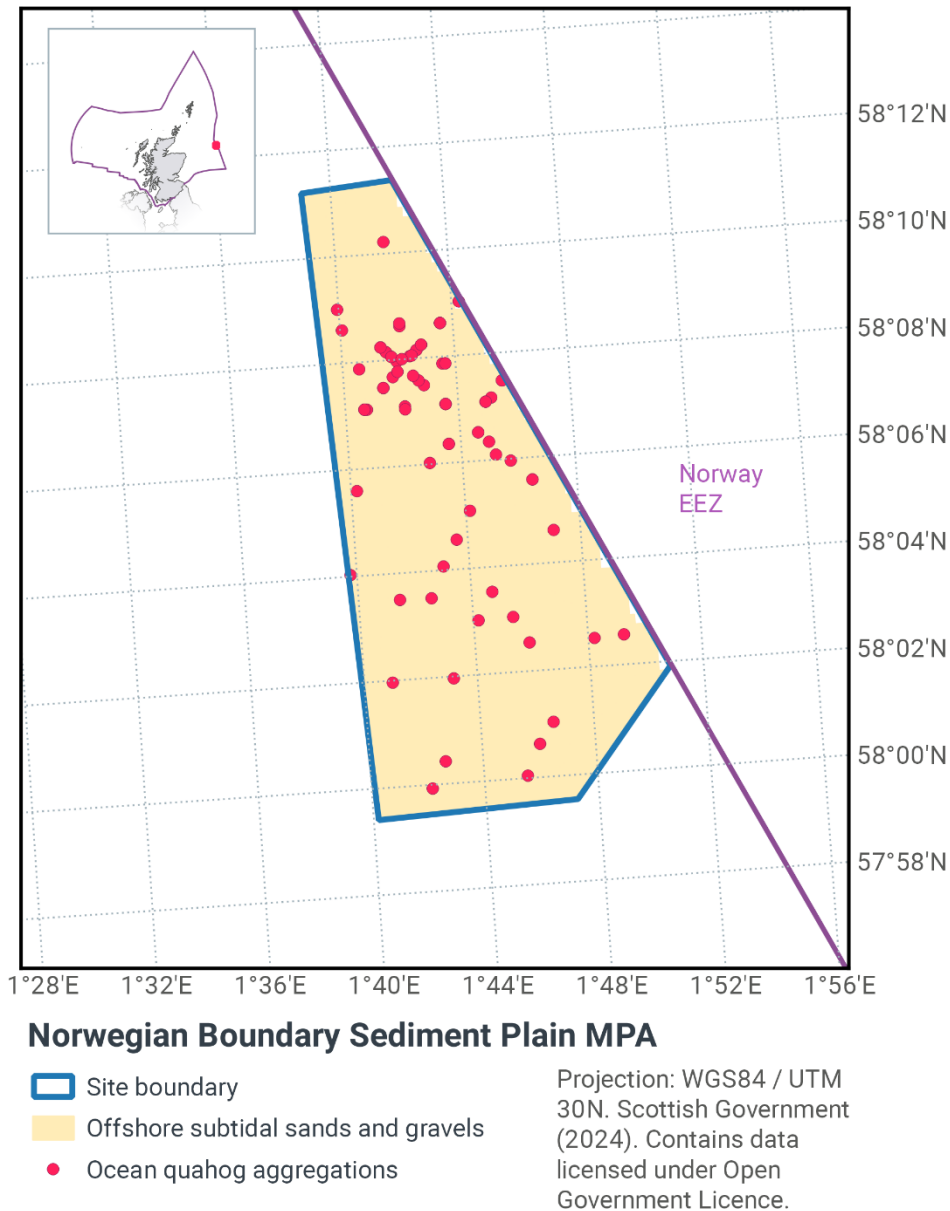


Figure 1 Norwegian Boundary Sediment Plain NCMPSA site boundary and feature distribution.

1.3 Activities assessed

The assessments consider the impacts of fisheries activities at each NCMPSA in terms of the conservation objectives stated for the designated sites. This was deemed appropriate in order to assist in identifying potential management measures.

In this context, the implications of the fishing activity in view of the conservation objectives for the NCMPSA are being assessed through the fisheries screening stage (Part A), the fisheries assessment (Part B), and the in combination (cumulative effect) assessment (Part C).

Fisheries assessments use the best available evidence to fully consider potential impacts of commercial fishing activity, and in-combination (cumulative) effects with

other activities, against the conservation objectives for the site. If the assessment concludes that use of certain fishing gear types would or might hinder the achievement of the conservation objectives of the site, management measures will be considered.

Commercial sea fishing activity has the potential to vary in nature and intensity over time. This assessment considers fishing activity based on activity levels and type between 2015-2019. This date range was considered to provide the best available data on current fishing activity levels for the assessment. Using a five-year date range provides an average view of fishing activity within the site; latter years (2020 – 2021) were not considered representative of regular fishing activity due to the Covid pandemic. The selected date range (2015 – 2019) was used consistently across all assessments within the consultation package. Changes in fishing activity after this time period may be considered in future reviews of this assessment (see Section 6).

2. Part A Assessment – Fisheries Screening

2.1 Fisheries screening overview

Part A of this assessment considers whether the fishing activity would be capable of affecting the protected features of an NCMPA or any ecological or geomorphological process on which the conservation of any protected feature is dependent. This section looks at the pressures exerted by the fishing activity occurring in the site (within the assessment period) in relation to the sensitivities of the protected features. Activities potentially capable of affecting the protected feature were identified where there was both a medium-high risk of a pressure arising from the fishing activity and if any of the features were considered sensitive to that pressure. These pressure-features interactions were then taken forward to the fisheries assessment stage (Part B) to determine whether the fishing activity in question would or might hinder the achievement of the conservation objectives.

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 Part B:
 - a. If the feature is not exposed to the pressure, and is not likely to be in the future; or
 - b. If the effect/impact of the pressure is non-existent or insignificant.
2. The pressure-feature interactions were included for assessment in Part B:
 - a. If the feature is exposed to the pressure, or is it likely to be in the future; and
 - b. If the pressure is capable of affecting the feature; or
 - c. If it is not possible to determine whether the pressure is capable of affecting the feature.

Part B of the assessment considers the potential for activities to affect the feature by assessing the impact of fishing gears identified in Part A. This involves determining the level of interaction between the feature and the fishing activity, assessing the potential impact on the feature, and subsequently if fishing activities would or might hinder the achievement of the conservation objectives for the site.

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

The JNCC [Conservation Advice package](#) and [Fisheries Management Options Paper for Norwegian Boundary Sediment Plain NCMPA](#) have been used to inform this assessment. This is the most recent assessment package and options paper available.

Where appropriate, this advice has been supplemented by information on feature sensitivity from [MarLIN](#) and pressures associated with fishing activity from the [JNCC Marine Pressures-Activities Database \(PAD\) v1.5 2022](#) and the [Feature Activity Sensitivity Tool \(FeAST\)](#).

2.2 Activities taking place within Norwegian Boundary Sediment Plain NCMPA

To screen out fishing activities that were not taking place within the site or likely to take part on the future, vessel monitoring system (VMS) data within Norwegian Boundary Sediment Plain NCMPA from 2015 – 2019 were analysed to identify the gear types being used in the site, and the aggregated gear method (Table 1). The fishing gears screened out at this stage were not taken forward to Part B of the assessment.

Table 1. Gear types recorded from the site based on VMS data from 2015 – 2019.

Gear type	Specific Gear Type	Gear code	Aggregated gear method
Towed	Bottom otter trawl	OTB	Demersal trawls
	Multi-rig trawls	OTT	
	Bottom trawls (not specified)	TB	
	Bottom pair trawl	PTB	
	Scottish fly/seine	SSC	Demersal seines

2.3 Potential pressures exerted by site fishing activity

The potential pressures that could be exerted by fishing activities occurring within the site (demersal trawls and demersal seines) were determined using the [JNCC Marine Pressures-Activities Database \(PAD\) v1.5 2022](#). The potential pressures that could be exerted by demersal trawls are summarised in Table 2.

Table 2. Potential pressures from the JNCC Marine Pressures-Activities Database (PAD) v1.5 2022 and their risk profiling of pressures score, based on the general risk the pressures pose to the environment under normal conditions. Pressures are considered to pose a medium/high risk (dark blue), low risk (light blue), or are not relevant to the activity (white).

PAD Pressure	Demersal Seines	Demersal trawls
Above water noise	Low	Low
Abrasion/disturbance of the substrate on the surface of the seabed	Medium-high	Medium-high
Barrier to species movement	Not relevant	Not relevant
Changes in suspended solids (water clarity)	Medium-high	Medium-high
Collision ABOVE water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)	Low	Low
Collision BELOW water with static or moving objects not naturally found in the marine environment (e.g. boats, machinery and structures)	Low	Low
Deoxygenation	Low	Low
Hydrocarbon & PAH contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.	Low	Low
Introduction of light	Low	Low
Introduction of microbial pathogens	Low	Low
Introduction or spread of invasive non-indigenous species (INIS)	Low	Low
Litter	Low	Low
Nutrient enrichment	Low	Low
Organic enrichment	Low	Low
Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion	Medium-high	Medium-high
Physical change (to another seabed type)	Low	Low
Physical change (to another sediment type)	Low	Low
Removal of target species	Medium-high	Medium-high
Removal of non-target species	Medium-high	Medium-high
Smothering and siltation rate changes (Light)	Medium-high	Medium-high
Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals). Includes those priority substances listed in Annex II of Directive 2008/105/EC.	Low	Low

Transition elements and organo-metal (e.g. TBT) contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC	Low	Low
Underwater noise changes	Low	Low
Visual disturbance	Low	Low

2.4 Significance of effects/impacts to protected features

To determine whether each pressure could be capable of affecting the site's features, the sensitivity assessments and risk profiling of pressures from the [JNCC Advice on Operations](#) from the site conservation package and the [JNCC Marine Pressures-Activities Database \(PAD\) v1.5 2022](#) were used. For the Norwegian Boundary Sediment Plain NCMPS, following JNCC advice, FeAST was used to establish the feature sensitivity to the relevant pressures for ocean quahog aggregation and offshore subtidal sands and gravels feature. This was to ensure the most up to date sensitivity evidence was used.

As Offshore subtidal sands and gravels are not a feature assessed within FeAST, Continental shelf mixed sediments were used as a comparable habitat. This decision was informed by the [Data confidence assessment](#) undertaken for the NCMPS which utilised predictive habitat map [EUSeaMap](#)¹. This was used to indicate extent of supporting habitats within the site. The map is the result of work undertaken by a consortium lead by the JNCC to combine physical data describing the marine environment with information from biological sampling, generating a broad-scale habitat model of seabed habitats from which a predictive map was created (Cameron & Askew, 2011).

[EUSeaMap \(2023\)](#) predicts that suitable habitat for colonisation by Ocean quahog occurs throughout the NCMPS area. The following habitats are predicted to be present: A5.15 Deep circalittoral coarse sediment and A5.27 Deep circalittoral sand (the dominant habitat type covering 97% of the NCMPS). These components are all considered suitable habitat type for ocean quahog colonisation (Witbaard & Bergman, 2003; Sabatini & Pizzolla, 2008). Confidence in the presence and extent of the protected features has been set out in the [Data Confidence Assessment](#).

Table 3. Extract of the Advice on Operations for Norwegian Boundary Sediment NCMPS, showing the pressures from specific activities and the potential sensitivity of the protected features. The features are categorised as having High Sensitivity (dark blue), Medium Sensitivity (dark blue), Sensitive (light blue), Not Sensitive (white), Not

¹ Licensed under CC-BY 4.0 from the European Marine Observation and Data Network (EMODnet) Seabed Habitats initiative (www.emodnet-seabedhabitats.eu), funded by the European Commission.

Exposed (white), Not Assessed (white), and Unknown (white). Further details on these categories are available in the associated methods document.

Potential pressures	Protected feature sensitivity	
	Ocean Quahog aggregations	Offshore sands and gravels as supporting habitat
Above water noise	Low	Medium
Abrasion/disturbance of the substrate on the surface of the seabed	Not assessed	Not assessed
Barrier to species movement	Not assessed	Not assessed
Changes in suspended solids (water clarity)	Not exposed	Medium
Collision ABOVE water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)	Not relevant	Not relevant
Collision BELOW water with static or moving objects not naturally found in the marine environment (e.g. boats, machinery and structures)	Not assessed	Not assessed
Deoxygenation	Not sensitive	Not exposed
Hydrocarbon & PAH contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.	Sensitive	Sensitive
Introduction of light	Not relevant	Not relevant
Introduction of microbial pathogens	Not assessed	Not assessed
Introduction or spread of invasive non-indigenous species (INIS)	Not assessed	High
Litter	Not assessed	Not assessed
Nutrient enrichment	Not assessed	Not sensitive
Organic enrichment	Not sensitive	Not sensitive
Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion	High	High
Physical change (to another seabed/sediment type)	High	High
Removal of target species	Not exposed	Not exposed
Removal of non-target species	Not exposed	Not exposed
Siltation rate changes (low), including smother (depth of vertical sediment overburden)	Not sensitive	Not sensitive

Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals). Includes those priority substances listed in Annex II of Directive 2008/105/EC.	Sensitive	Sensitive
Transition elements and organo-metal (e.g. TBT) contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC	Sensitive	Sensitive
Underwater noise changes	Not sensitive	Not sensitive
Visual disturbance	Not relevant	Not relevant

Considering both the information on pressure activity association (Table 2) and the sensitivity of the features (Table 3), pressures that have the potential to affect the feature are summarised in Table 4.

Pressures that are not relevant to demersal trawls and demersal seines, (pressures that are not exerted by that fishing activity: 'not relevant to the activity' in Table 4) do not need to be considered further in the assessment. According to the [PAD methods document](#) (Robson et al., 2018), pressures with low risk profiles (i.e. 'low' risk profile for the activity: Table 2 and Table 4) generally do not occur at a level of concern and should not require consideration as part of an assessment, unless there are evidence-based case or site-specific factors that increase the risk, or there is uncertainty on the level of pressure on a receptor. Pressures with 'medium-high' risk profiles are commonly induced by the activity at a level that needs to be considered further as part of an assessment.

Of all the pressures considered, five have a medium-high risk profile (PAD) and have a medium high sensitivity: abrasion/disturbance of the substrate on the surface of the seabed, changes in suspended solids (water clarity), penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion, removal of non-target species and smothering and siltation rate changes (light). These five pressures are subsequently considered to have the potential to affect the protected features. All five of these pressures are exerted by demersal trawls and demersal seines.

To ensure the effects of fishing activities in-combination with other activities (including other fishing activities) are fully assessed, the pressures from fishing activities which were not considered capable of having a significant effect but which do interact with the features are considered in the in-combination aspect of the assessment (Part C).

Table 4. Summary of pressures that could be capable of affecting the protected features, based on pressure-activity associations and sensitivity. Pressures that are capable of affecting are in dark blue.

Potential pressure	Fishing activity	
	Demersal Seines	Demersal Trawls
Above water noise	No – not relevant to activity.	
Abrasion/disturbance of the substrate on the surface of the seabed	Yes – the pressure has a Medium-high risk profile AND the feature is sensitive to this pressure.	
Barrier to species movement	No – pressure is not relevant to the feature or activity.	
Changes in suspended solids (water clarity)	Yes – the pressure has a Medium-high risk profile AND the sensitivity of the feature is classed as not assessed.	
Collision ABOVE water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)	No – low risk profile for activity and not relevant to the feature.	
Collision BELOW water with static or moving objects not naturally found in the marine environment (e.g. boats, machinery and structures)	No – low risk profile for activity and not relevant to the feature.	
Deoxygenation	No - low risk profile for activity and feature is not sensitive.	
Hydrocarbon & PAH contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.	No – although the feature is sensitive there is a low risk profile for activity.	
Introduction of light	No - low risk profile for activity and not relevant to the feature.	
Introduction of microbial pathogens	No – pressure is not relevant to the feature or activity.	
Introduction or spread of invasive non-indigenous species (INIS)	No - low risk profile for activity.	
Litter	No - low risk profile for activity.	
Nutrient enrichment	No - low risk profile for activity.	
Organic enrichment	No - low risk profile for activity and feature is not sensitive.	
Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion	Yes – the pressure has a Medium-high risk profile AND the feature is sensitive to this pressure	
Physical change (to another seabed type)	No – although the feature is sensitive to this pressure, the pressure has a low risk profile for the activity.	
Physical change (to another sediment type)	No – although the feature is sensitive to this pressure, the pressure has a low risk profile for the activity.	

Removal of target species	No – the pressure has a Medium-high risk profile, however the pressure is not relevant to the feature.
Removal of non-target species	Yes – the pressure has a Medium-high risk profile AND the feature is sensitive to this pressure.
Smothering and siltation rate changes (light)	Yes – the pressure has a Medium-high risk profile AND the feature is sensitive to the pressure.
Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals). Includes those priority substances listed in Annex II of Directive 2008/105/EC.	No – although the feature is sensitive to this pressure, the pressure has a low risk profile for the activity.
Transition elements and organo-metal (e.g. TBT) contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC	No – although the feature is sensitive to this pressure, the pressure has a low risk profile for the activity.
Underwater noise changes	No - low risk profile for activity and feature is not sensitive.
Visual disturbance	No - low risk profile for activity and feature is not sensitive.

2.5 Part A Conclusion

Considering the information on pressures and sensitivity above, demersal trawls and demersal seines have the potential to affect the Ocean quahog aggregations and the supporting Offshore subtidal sands and gravel features in the Norwegian Boundary Sediment Plain NCMPA, through abrasion/disturbance of the substrate on the surface of the seabed, changes in suspended solids (water clarity), penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion, removal of non-target species and smothering and siltation rate changes (light). These five pressures are considered to have the potential to affect the features are taken through to Part B of the assessment.

3. Part B – Fisheries Assessment

3.1 Fisheries Assessment overview

Part B of this assessment considers if there would be a risk of the fishing activities identified in Part A, at the levels identified in the relevant date range, hindering the achievement of the conservation objectives for the NCMPA. This is in order to

consider whether, and if so, which, management measures might be appropriate for the NCMPA, taking into account all relevant statutory obligations incumbent upon the Scottish Ministers.

The fishing activities and pressures identified in Part A which have been included for assessment in Part B, are demersal trawls and demersal seines, and the pressures abrasion/disturbance of the substrate on the surface of the seabed; penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion; removal of non-target species, and smothering and siltation rate changes (light).

3.2 Fishing Activity descriptions

3.2.1 Existing management of fishing activity within the Norwegian Boundary Sediment Plain NCMPA

No existing fisheries restrictions were identified for the site.

3.2.2 Fishing Activity within the NCMPA

The Norwegian Boundary Sediment Plain NCMPA overlaps ICES rectangles 45F1 and 44F1 and sits within ICES Division 4a. The main gear types for UK vessels are demersal trawls and demersal seines.

The VMS-based estimates and ICES rectangle landings statistics indicate that vessels utilising demersal trawls are the predominant UK vessels that operated within the site over the period 2015-2019.

For the over-12 m vessels, based on the VMS data from 2015-2019, demersal trawls and seines occurred at low levels across the full site.

3.2.3 Demersal Trawls

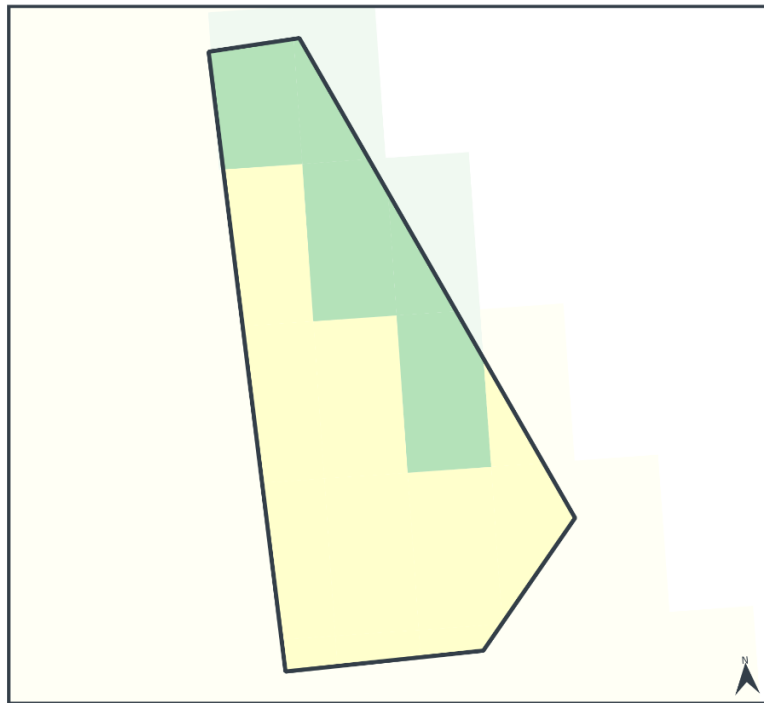
The aggregated gear method of demersal trawls includes the multiple gears that operated within the Norwegian Boundary Plain NCMPA between 2015 and 2019. These include bottom otter trawls, multi-rig trawls, pair trawls, and other not specified bottom trawl types (Table 1).

The target species for these gear types are demersal fish and nephrops. Similar pressures are exerted by the different gears used for demersal trawling, subsequently the aggregated gear type of 'demersal trawl' was used to map activity across the site.

Based on the VMS, the highest intensity of demersal trawl activity within NCMPA occurs in the Northern region of the site, with activity peaking at 12-24 hours per year per grid cell of activity occurring per year between 2015-2019 (Figure 2). The majority of the site has lower fishing intensity (less than 12 fishing hours per year per grid cell).

Swept-Area Ratio (SAR) information averaged over the same time period shows similar levels of fishing intensity as the VMS data with low SAR values (cells swept less than once per year) shown across the full site (Figure 2).

Norwegian Boundary Sediment Plain



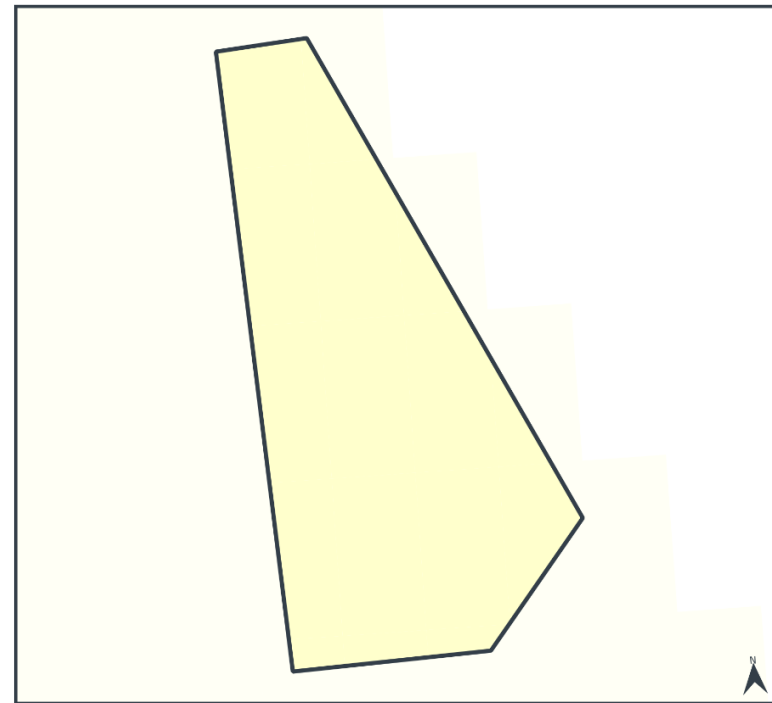
Average VMS intensity (2015 to 2019) for demersal trawls

- Less than 12 hours
- 12 to 24 hours
- 24 to 48 hours (1 to 2 days)
- 48 to 168 hours (2 days to 1 week)
- 168 to 336 hours (1 to 2 weeks)
- Greater than 336 hours (Greater than 2 weeks)



Projection: WGS84 UTM 30N. Scottish Government (2024). Contains data licensed under the Open Government Licence and data from ICES Advice 2021, sr.2021.12.
<https://doi.org/10.17895/ices.advice.8297>

Norwegian Boundary Sediment Plain



Average Swept Area Ratio (2015 to 2019) for demersal trawls

- Cell swept less than once
- Cell swept 1 to 2 times
- Cell swept 2 to 5 times
- Cell swept 5 to 10 times
- Cell swept 10 to 20 times
- Cell swept more than 20 times



Projection: WGS84 UTM 30N. Scottish Government (2024). Contains data licensed under the Open Government Licence and data from ICES Advice 2021, sr.2021.12.
<https://doi.org/10.17895/ices.advice.8297>

Figure 2. Annual fishing intensity averaged over 2015 - 2019 for demersal trawls based on the VMS data (left) and Swept Area Ratio (right).

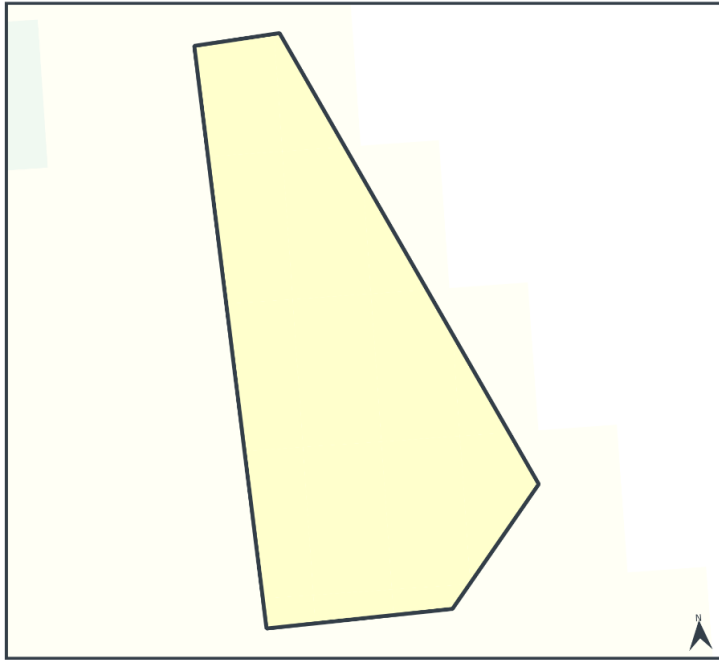
3.2.4 Demersal Seines

Scottish Seine was the only seine gear type found to operate within the Norwegian Boundary NCPA between 2015 and 2019 (Table 1). These seines target demersal fish.

Based on the VMS, demersal seine activity within Norwegian Boundary Sediment Plain NCPA was evenly distributed across the full site, showing less than 12 hours per year per grid cell (Figure 3).

Swept-Area Ratio (SAR) information averaged over the same time period shows similar patterns of fishing intensity as the VMS data (Figure 3) with areas of low fishing intensity dispersed throughout the site, which were swept less than once between 2015-2019. The south-east corner of the site shows that the areas were swept one to two times on average throughout 2015-2019.

Norwegian Boundary Sediment Plain



Average VMS intensity (2015 to 2019) for demersal seines

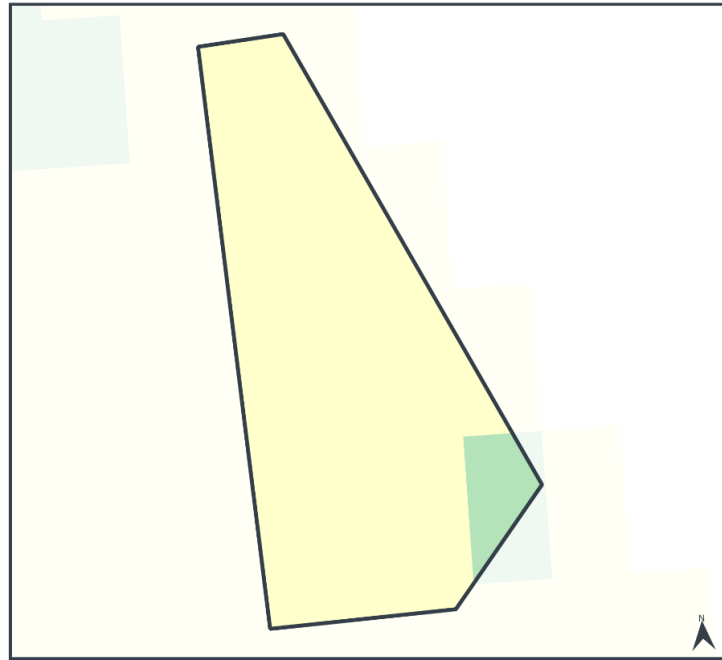
- Less than 12 hours
- 12 to 24 hours
- 24 to 48 hours (1 to 2 days)
- 48 to 168 hours (2 days to 1 week)
- 168 to 336 hours (1 to 2 weeks)
- Greater than 336 hours (Greater than 2 weeks)



0 7 km

Projection: WGS84 UTM 30N. Scottish Government (2024). Contains data licensed under the Open Government Licence and data from ICES Advice 2021, sr.2021.12. <https://doi.org/10.17895/ices.advice.8297>

Norwegian Boundary Sediment Plain



Average Swept Area Ratio (2015 to 2019) for demersal seines

- Cell swept less than once
- Cell swept 1 to 2 times
- Cell swept 2 to 5 times
- Cell swept 5 to 10 times
- Cell swept 10 to 20 times
- Cell swept more than 20 times



0 7 km

Projection: WGS84 UTM 30N. Scottish Government (2024). Contains data licensed under the Open Government Licence and data from ICES Advice 2021, sr.2021.12. <https://doi.org/10.17895/ices.advice.8297>

Figure 3. Annual fishing intensity averaged over 2015 - 2019 for demersal seines based on the VMS data (left) and Swept Area Ratio (right).

3.2.5 Summary of fishing activity within Norwegian Boundary Sediment Plain NCMPA

Evidence of demersal trawl activity and potential demersal seine activity were found to occur at very low intensity within the site. Both activities occurred across the full site.

3.3 Fishing activity effects overview

The following sections explore the impacts associated with demersal mobile (demersal trawl and seines) fishing activity within the Norwegian Boundary Sediment Plain NCMPA that were identified as potentially capable of impacting the protected features. The pressures considered in the following sections are:

- Abrasion/disturbance of the substrate on the surface of the seabed;
- Changes in suspended solids (water clarity),
- Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion;
- Removal of non-target species; and
- Smothering and siltation rate changes (light).

All five pressures, as exerted by demersal trawls and demersal seines were considered capable of impacting the Ocean quahog aggregations and the supporting Offshore subtidal sands and gravels features within Norwegian Boundary Sediment Plan NCMPA.

Given the similarity between ‘abrasion/disturbance of the substrate on the surface of the seabed’ and ‘penetration and/or disturbance of the substrate below the surface of the seabed’, these two pressures are considered together in the text below.

Information on the impacts of demersal trawls and demersal seines on the protected features is presented below and is informed by the [JNCC and NatureScot Fisheries Management Guidance document for *Arctica islandica*](#), [JNCC and NatureScot Fisheries Management Guidance document for Offshore subtidal sands and gravels](#), [JNCC Marine Pressures-Activities Database v1.5](#) and [Advice on Operations package](#) for the site.

3.3.1 Summary of impacts associated of demersal mobile gear on Norwegian Boundary Sediment Plain NCMPA protected features

Towed bottom fishing gears (including demersal trawls and seines) are used to catch species that live in, on or in association with the seabed and therefore are designed to remain in close contact with the seabed. That interaction with the seabed can lead to disturbance of the upper layers of the seabed. As a relative comparison of gear types, otter trawls tend to have less physical impact on the seafloor than beam trawls (and dredges) with their heavy tickler chains, although the doors of an otter trawl do create recognisable scour of the seabed ((Hinz, Murray, Malcom, & Kaiser, 2012); (Polet & Depestele, 2010); (Lart, 2012); (Paschen, Richter, & Köpnick, 2000)). The

magnitude of the immediate response to fishing disturbance, cumulative effects and recovery times varies significantly according to factors such as the type of fishing gear and fishing intensity, the habitat and sediment type, levels of natural disturbance and among different taxa ((Collie, Hall, Kaiser, & Poiner , 2000); (Boulcott, Millar , & Fryer, 2014); (Kaiser, et al., 2006); (Hinz, Prieto, & Kaiser, 2009); (Kaiser M. J., Collie, Hall, Jennings, & Poiner, 2003)).

There is some evidence that otter trawl doors may impact ocean quahogs by bringing them to the surface (Rumohr & Krost, 1991), however there is insufficient evidence to assess the mortality caused by this gear at a population level. The northern North Sea is primarily fished by otter trawls and ocean quahog does not appear to have declined to the same extent as seen in southern areas. However, ocean quahog within the NCMPA are currently considered to be in unfavourable condition.

As with demersal trawls and dredges, demersal seines may impact the structure and function of sedimentary habitats and the long-term survival of their associated species. There are currently no direct studies on the physical impacts of demersal seines. Modelling studies suggest that demersal seines have a large overall footprint (i.e. the surface area covered during one hour fishing) (Eigaard, et al., 2016). Hiddink, et al., (2018) suggest that depletion of biota is highly correlated with seabed penetration depth by trawls. Seines lack the heavy gear components (e.g. otter doors, trawl shoes) of other demersal mobile gears ((Suuronen, et al., 2012) ; (Donaldson, Gabriel, Harvey, & Carolsfield, 2010)) and therefore, despite the relatively large footprint, impacts associated with penetration into the sediment are likely to be lower. Eigaard, et al., (2016) modelled surface (<2 cm) and subsurface (>2cm) impacts and found that demersal seines have some of the smallest proportions of subsurface impact.

No evidence was found on the effects of shellfish dredging. However, the physical effects of scallop dredging on seabed sediments are similar to those of beam trawls (penetration to depths >5 cm) and so the effects on ocean quahog are likely to be similar. Hydraulic gears penetrate sediments more deeply than other gears and so could be expected to cause a greater mortality, particularly where ocean quahog is the target species (although there is no known direct exploitation of the species in the UK).

Bycatch (i.e. discarded catch) is associated with almost all fishing activities and is related to factors such as the gear type and its design (i.e. its selectivity), the targeted species and effort. There are significant concerns over the impacts of discards on marine ecosystems, including changes in population abundance and demographics of affected species and altered species assemblages and food web structures ((Alverson, Freeberg, Murawski, & Pope, 1994) (Kaiser M. J., Collie, Hall, Jennings, & Poiner, 2003)).

Benthic trawls most frequently result in bycatch of fish, crustaceans and other invertebrates ((Gubbay & Knapman, 1999) (Sewell & Hiscock, Effects of fishing within UK European Marine Sites: Guidance for nature conservation agencies, 2005); (ICES, 2013); (Pierpoint, 2000); (Bergmann & Moore, 2001); (Catchpole, Frid,

& Gray, 2005); (Tulp, Piet, Quirijns, Rijnsdorp, & Lindeboom, 2005)). There are relatively few studies of the non-fish bycatch composition from demersal seines, however, it is probably similar to that of demersal trawls e.g. crustaceans and other invertebrates, etc, although quantities of such bycatch are likely to be lower than that of other gear types such as beam trawls ((Suuronen, et al., 2012); (ICES, 2011); (Donaldson, Gabriel, Harvey, & Carolsfield, 2010) (Walsh & Winger, 2011)).

Ocean quahog are classed as having medium sensitivity to the pressure removal of non-target species (including lethal) in FEAST². Hamon et al. (2020) also report ocean quahog as being sensitive to demersal seine fishing due to their capture as bycatch in the southern North Sea, however, this assessment is associated with uncertainty due to the sampling technique not being representative of deep burrowing species and larger epifaunal species. Overall, demersal seines may have a relatively lower impact on ocean quahog compared to other demersal towed gears, as the gear is lighter and has no trawl doors or warps.

This is supported by evidence suggesting that *Arctica islandica* can be caught or damaged by beam trawls (Witbaard and Klein 1994; Klein & Witbaard 1993), with an individual pass of the gear causing around 20% mortality (Bergman and van Santbrink 2000). Population density has been found to be inversely related to beam trawling effort (Craeymeersch et al, 2000).

The [JNCC and NatureScot Fisheries Management Guidance document for *Arctica islandica*](#) states that demersal towed and hydraulic gears that penetrate the sediment (beam trawls, dredges and hydraulic gears including those operated by divers) are likely to reduce the abundance of ocean quahogs. The degree of impact will depend on the intensity of fishing. Further research will be required to determine the amount of fishing with these gears (if any) that would be compatible with maintaining the feature in good condition. Current evidence suggests that additional management is unlikely to be required for demersal otter trawling at low intensity levels due to limited penetration of the sediment. However, to determine the effects of otter trawl at high levels of effort would require further research.

Impacts from siltation rate changes, and changes in suspended solids may result from physical disturbance of the sediment, along with hydrodynamic action caused by the passage of towed gear, leading to entrainment and suspension of the substrate behind and around the gear components and subsequent siltation ((Sewell, Harris, Hinz, Votier, & Hiscock, 2007); (Gubbay & Knapman, 1999); (Lart, 2012); (Kaiser M. J., Collie, Hall, Jennings, & Poiner, 2002); (Riemann & Hoffmann, 1991); (O'Neill, Summerbell, & Breen, 2008); (Dale, Boulcott, & Sherwin, 2011); (O'Neil & Summerbell, 2011)).

The quantity of suspended material, its spatial and temporal persistence and subsequent patterns of deposition will depend on factors associated with the gear (such as type/design, weight, towing speed), sediment (particle size, composition, compactness), the intensity of the activity and the background hydrographic conditions ((Sewell, Harris, Hinz, Votier, & Hiscock, 2007); (Kaiser M. J., Collie, Hall,

² feature-activity-sensitivity-tool.scot/search-activity

Jennings, & Poiner, 2002); (Dale, Boulcott, & Sherwin, 2011); (O'Neil & Summerbell, 2011)). Sediment remobilisation and deposition can affect the settlement, feeding, and survival of biota through smothering of feeding and respiratory organs. Prolonged exposure of an area to the pressure may result in changes in sediment composition ((Kaiser M. J., Collie, Hall, Jenning, & Poiner, 2003); (Sewell, Harris, Hinz, Votier, & Hiscock, 2007); (Gubbay & Knapman, 1999); (Kaiser M. J., Collie, Hall, Jennings, & Poiner, 2002); (O'Neil & Summerbell, 2011)).

The extent to which mobile gear impacts on the supporting sand and gravel sediment habitat can vary considerably according to the type of gear, the intensity of fishing and the sediment composition. In high energy locations, sediments can become naturally disturbed, whilst in lower energy locations, such as muddy sands and sand in deep water, sediments tend to be more stable. The Norwegian Boundary Sediment Plain NCMPS is a shallow sandy plain, with EUSeaMap noting the area to be low energy and thus more likely to be potentially exposed to relatively higher levels of natural disturbance.

The predictive habitat map, [EUSeaMap](#), used to indicate extent of supporting habitat is the result of work undertaken by a consortium lead by the JNCC to combine physical data describing the marine environment with information from biological sampling, generating a broad-scale habitat model of seabed habitats from which a predictive map was created (Cameron & Askew, 2011). The habitat map from the model predicts that suitable habitat for colonisation by Ocean quahog occurs throughout the NCMPS. More specifically, the following habitats are predicted to be present: [A5.15 Deep circalittoral coarse sediment](#) and [A5.27 Deep circalittoral sand](#) (the dominant habitat type covering 97% of the NCMPS). These components are all considered suitable habitat type for ocean quahog colonisation (Witbaard & Bergman, 2003); (Sabatini & Pizzolla, 2008). Very little data is available on these habitats however they are likely to be more stable than their shallower counterparts and characterised by a diverse range of polychaetes, amphipods, bivalves and echinoderms.

The [JNCC and NatureScot Fisheries Management Guidance document for Offshore subtidal sands and gravels](#) states that the variability in the sensitivity of sand and gravel sediments to fishing disturbance is such that site by site consideration of management options is likely to be the best approach. However, there are general points that can be applied. In lower energy locations, such as muddy sands and sand in deep water, sediments tend to be more stable and their associated fauna less tolerant of disturbance (Kaiser et al., 2006, Hiddink et al., 2006). Stable gravels often support a 'turf' of fragile species which are easily damaged by trawling and recover slowly (Collie et al., 2005; Foden et al., 2010). The requirement for management of fishing is therefore more likely in lower energy areas, such as those found within the NCMPS.

Gears that penetrate deeply into the sediment (>5 cm) would generally be of more concern than those with only surface impacts (e.g. light trawls, seines). In most cases, good information on the distribution and intensity of fishing activity and good knowledge of the current condition of features relative to their potential recovered condition will be required to inform management options. The VMS data for the

NCMPA shows that low levels of demersal trawling and seine netting takes place at a low level across the site, and no other gear types were utilised from 2015 -2019.

Given the evidence outlined above regarding the physical impacts of gear interacting with the seabed, of the gear types occurring within the site, demersal trawl and demersal seine do not carry a risk to hindering Ocean quahog aggregations or the supporting habitat at current levels of activity. Accordingly, Scottish Ministers conclude that the demersal trawl and demersal seine occurring within the site at current activity levels would not hinder the achievement of the conservation objectives of Ocean quahog and its supporting habitat of Offshore subtidal sands and gravel for Norwegian Boundary Sediment Plain NCMPA.

3.4 Part B Conclusion

The assessment of impact of fishing pressures at current activity levels on Ocean quahog aggregations features and the supporting habitat of Offshore subtidal sands and gravels of Norwegian Boundary Sediment Plain NCMPA has indicated that demersal trawl and demersal seine when considered in isolation, will not hinder the achievement of the conservation objectives of the site.

4. Part C Assessment – In Combination Assessment

Part C of this assessment considers the cumulative impacts, which may occur over space and time, in relation to activities occurring within the NCMPA. Activities assessed in this section include the following:

- Fishing activity/pressure combinations which were excluded in Part A of this assessment as not being capable of impacting;
- Fishing interactions assessed in Part B that would not hinder the conservation objectives for the site; and
- Activities occurring within Norwegian Boundary Sediment Plain NCMPA that are not related to fishing.

Demersal trawls and demersal seines were not considered to hinder the achievement of conservation objectives on their own and so they are assessed in combination with other activities occurring at the site in this Part C.

4.1 In-combination assessment overview

4.1.1 Other offshore region activities screening

To determine activities, not related to fishing activities, to be included within this part of the assessment, a distance of 5 km was selected as suitable to capture any potential source receptor pathways that could impact the site in combination with effects of the fishing activities assessed. A 5 km buffer was therefore applied to the site boundary to identify relevant activities.

Activities not related to fishing activities were identified using the [Scottish Government's marine mapping tool](#). The JNCC Conservation Advice package, and

other resources on the JNCC Site Information Centre for Norwegian Boundary Sediment Plain NCMPS, were also screened for activities occurring in the site that should be considered in the in-combination assessment.

The map to display offshore region activities (see Fig. 6) was derived from [OceanWise's Marine Themes Vector data](#) (July 2023 version), [Crown Estate Scotland leases](#) (September 2023 version), Kingfisher Information Services Offshore Renewable Cable Awareness (KIS-ORCA, as of December 2023 held under licence) and North Sea Transition Authority (NSTA, as of December 2023, data held under Oil and Gas Authority open licence). The Marine Themes "Industrial" was filtered to show offshore region platforms, wellheads, piles, turbines, cables, and pipelines. Features marked as "not in use", "not present", "decommissioned", or "removed" were excluded. The "Administrative" data were filtered to only show military exercise areas which included danger areas.

4.1.2 Other offshore region activities occurring within Norwegian Boundary Sediment NCMPS

The screening exercise using the [Scottish Government's marine mapping tool](#) identified a number of other offshore activities taking place within the site or within 5 km of the site boundary. The activities found were one active and multiple decommissioned well heads, one active gas pipeline, one hydrocarbon pipeline and a decommissioned pipeline.

Screening did not identify any current cables, turbines or piles, or offshore region platforms within the site (Figure 4). An offshore platform is located approximately 5 km east of the site along with further pipelines.

An offshore region site for Innovation and Targeted Oil and Gas (INTOG) overlaps the southern west corner of the site. This is an area where projects targeting oil and gas decarbonisation will be considered however there are currently no proposed projects, or infrastructure in place for this site and subsequently these were not deemed to have potential for in-combination effects at this point in time. The UK oil and gas regulator Offshore Petroleum Regulator for Environment and Decommissioning would be responsible for making the decision on whether a proposed activity and/or development is capable of affecting the protected features of a Nature Conservation NCMPS.

Norwegian Boundary Sediment Plain

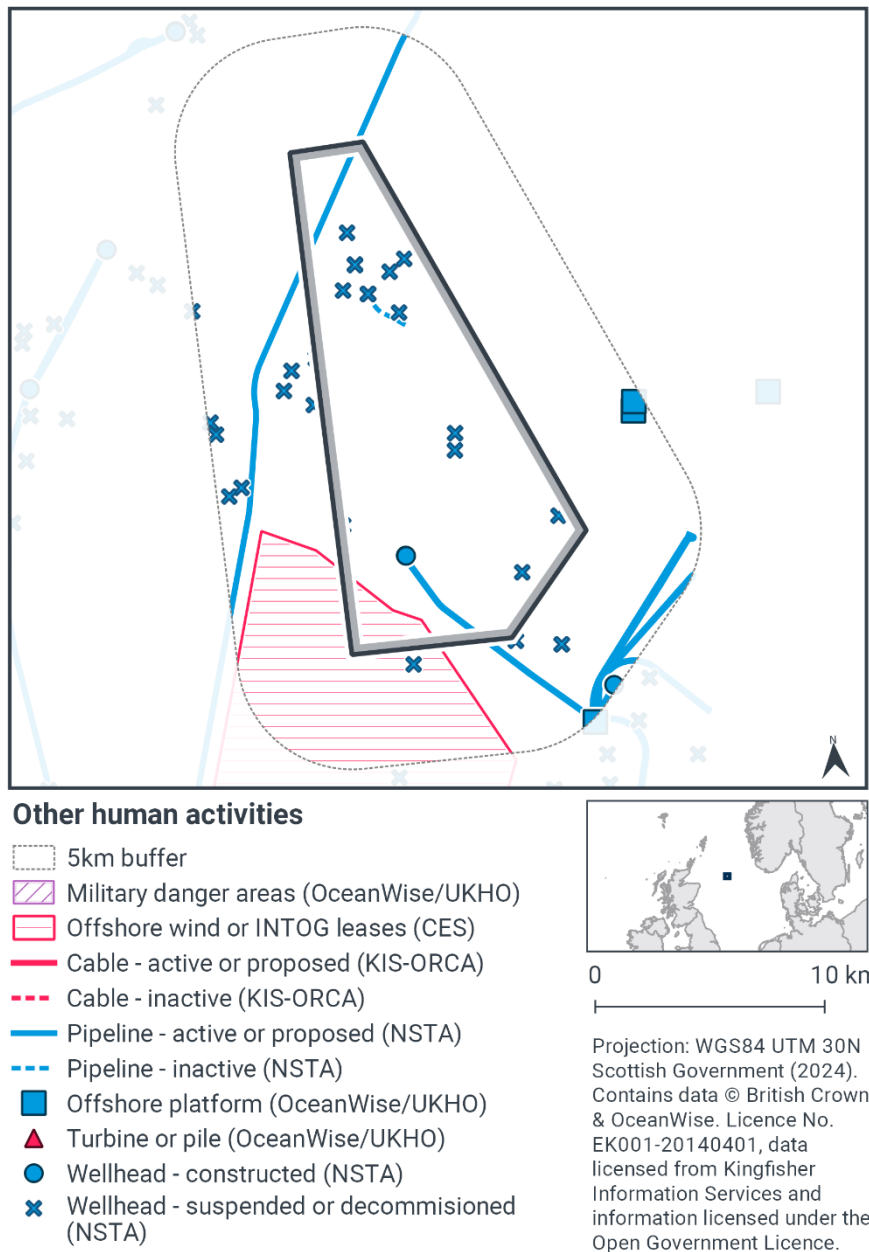


Figure 4. Other offshore activities occurring within or near to the Norwegian Boundary Sediment Plain NCMPPA.

4.2 Potential pressures exerted by fishing and other activities

Risks associated with oil and gas production and pipelines were assessed for the active wellhead and pipelines in the site. The active pipelines are currently in place, removing the risk of any pressures associated with laying, burial and protection, or decommissioning.

The JNCC PAD indicated six pressures exerted by oil and gas infrastructure operation and maintenance, and pipelines to be of a medium-high risk. Those that are considered a low risk are not assessed.

The six pressures are:

- Abrasion/disturbance of the substrate on the surface of the seabed;
- Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion;
- Habitat structure changes – removal of substratum (extraction);
- Introduction of other substances (solid, liquid or gas);
- Hydrocarbon & PAH contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC and;
- Smothering and siltation rate changes (light).

Three of these pressures above overlap with those exerted by demersal trawls and seines; abrasion/disturbance of the substrate on the surface of the seabed; penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion and smothering and siltation rate changes (light). These three pressures will be assessed in section 4.5.

4.3 Significance of effects/impact to protected features

Of the pressures identified, the protected features of the site are considered to be sensitive to three of these. These three pressures are Abrasion/disturbance of the substrate on the surface of the seabed; Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion and Smothering and siltation rate changes (Light) and also overlap with those exerted by demersal trawls and demersal seines.

As the pipelines are in situ and therefore not subject to pressures related to laying or decommissioning, the pressures identified in section 4.4 occur where the pipeline needs to be reburied or uncovered for repair. The frequency of the activity will be very low.

The active wellhead is located in the south west corner of the site, there is very little fishing activity occurring here at less than 12 hours per year per grid cell of demersal trawl or demersal seine annually. When taking into account the additional pressure exerted by fishing activity, in combination with pressures exerted by activity around the wellhead, this is likely to be a minimal increase in pressure.

Licensable activities such as oil and gas exploration and production taking place or that may take place within this NCMPA are managed in accordance with the clauses set out under Section 126 of The Marine & Coastal Access Act (2009). Under this clause, JNCC has a statutory responsibility to advise the regulator on developments that are capable of impacting the protected features of the NCMPA and that may hinder the achievement of the site's conservation objectives. JNCC considers the existing marine licensing process is sufficient to ensure the management of licensable activities taking place, or that could take place in the future, on the protected features of this NCMPA.

All these pressure-feature interactions for the fishing gears were not considered likely to affect the protected features of the site in Part B for the fishing activity levels within the site. When taken into account with the pressures exerted by oil and gas

infrastructure operation and maintenance, and pipelines, as the frequency of the activity is considered to be very low, no further management is considered.

Accordingly, the assessment did not identify any in-combination activities that were considered likely to affect the protected features of the site of Norwegian Boundary Sediment Plain NCMPA.

4.4 Part C conclusion

Scottish Ministers conclude that the remaining fishing activities (demersal trawl and demersal seine) in-combination with other relevant activities will not hinder the achievement of the conservation objectives for Norwegian Boundary Sediment Plain NCMPA.

5. Management Options

5.1 Overview of management options

Management measures for offshore NCMPAs are being considered by Scottish Ministers and any decision as to which measures ought to be taken forward will follow upon a statutory public consultation exercise. Any such decision will also be taken in line with the Scottish Ministers obligations in relation to the exercise of their functions.

Part B of this assessment concluded no management measures were required for the fishing activity found to occur within the site (demersal trawl and demersal seine). However, The Norwegian Boundary Sediment Plain NCMPA contains an area which is considered to be [least damaged, more natural](#). It was agreed at the stakeholder workshop that this area in the northern part of the NCMPA should be given a high level of protection to maintain that status. This means that this area in effect provides a reference point for a more natural habitat condition in the North Sea. This may prove helpful for future assessments of environmental status. Scottish Ministers are therefore proposing fisheries management measures for this site as outlines in Part B and JNCC advice to restrict demersal mobile activity within the site.

The socioeconomic impacts and costs of each management option (no additional management, zoned management, and full site exclusion) have been assessed within the Socio-Economic Impact Assessment (SEIA) and Sustainability Appraisal (SA), and are not discussed within this fisheries assessment. Nor are other considerations, statutory and non-statutory, which the Scottish Ministers may be required to take into account when assessing whether the imposition of a particular measure is appropriate.

This section assesses the suitability of the management options solely in light of the conservation objectives, biological characteristics of protected features, and current activity levels for Norwegian Boundary and Sediment Plain NCMPA.

5.2 Assessment of management options

5.2.1 No additional management

Although the assessment identified that no management measures would be required to avoid hindering the achievement of the conservation objectives for the site at current levels of fishing activity, when considering the conservation and fisheries management advice from the statutory nature conservation body (JNCC) highlights demersal mobile gears which are known to impact the protected feature (beam trawl, scallop and hydraulic dredging).

As mentioned above, the Norwegian Boundary Sediment Plain NCMPA contains an area which is considered to be least damaged, more natural. This means that this area in effect provides a reference point for a more natural habitat condition in the North Sea which may prove helpful for future assessments of environmental status. It was agreed at the stakeholder workshop that this area in the northern part of the NCMPA should be given a high level of protection to maintain that status. As such, measures to prevent demersal mobile gear occurring in the site in future is considered potentially necessary. Therefore the option of no management is not considered further.

5.2.2 Zoned management

Zoned fisheries management measures (Figure 5) would be introduced to reduce/limit pressures exerted by demersal mobile gear. This would be through a zoned management approach, which encompasses the exclusion of all demersal mobile gears from the northern section of the site, and excluding all gears other than demersal seines within the southern section of the site (59%). There would therefore be no measures for pelagic or static gears.

The Norwegian Boundary Sediment Plain NCMPA contains an area which is considered to be [least damaged, more natural](#). This means that this area in effect provides a reference point for a more natural habitat condition in the North Sea. This may prove helpful for future assessments of environmental status. It was agreed at the stakeholder workshop that this area in the northern part of the NCMPA should be given a high level of protection to maintain that status.

In this zoned management option, 41% of the site would be closed to all other demersal mobile gears, and the remaining 59% of the site would be open to demersal seines only. Although the impacts of demersal trawls on Ocean quahog aggregations and the supporting Offshore subtidal sands and gravels habitat are likely to be low, this option provides full protection to the site and their supporting sands and gravels habitat.

In the southern part of the NCMPA there has been little or no activity in recent years, however a precautionary approach is being taken by prohibiting activity to ensure the condition of the NCMPA features can be maintained or improved. In recognition of the lower impact of seine net fishing (except for pair seines which are more similar to pair trawls in use and effect), this gear will still be permitted in the southern part of the NCMPA.

The zoned management approach would contribute to the ecological coherence of both the Scottish NCMPA Network and the broader OSPAR NCMPA Network.

Ocean quahog are also listed as an OSPAR threatened and/or declining species in OSPAR region II. These measures would make a significant contribution towards recovery of the species. They should also further progress towards Good Environmental Status in the Greater North Sea, particularly in relation to Descriptors 1 (biological diversity) and 6 (sea-floor integrity).

Having considered the conservation and fisheries management advice from the statutory nature conservation bodies, and the wider evidence contained within this assessment, Scottish Ministers consider that zoned management measures would not hinder the achievement of conservation objectives for Norwegian Sediment Boundary Plain NCMPA, rather they would further those objectives.

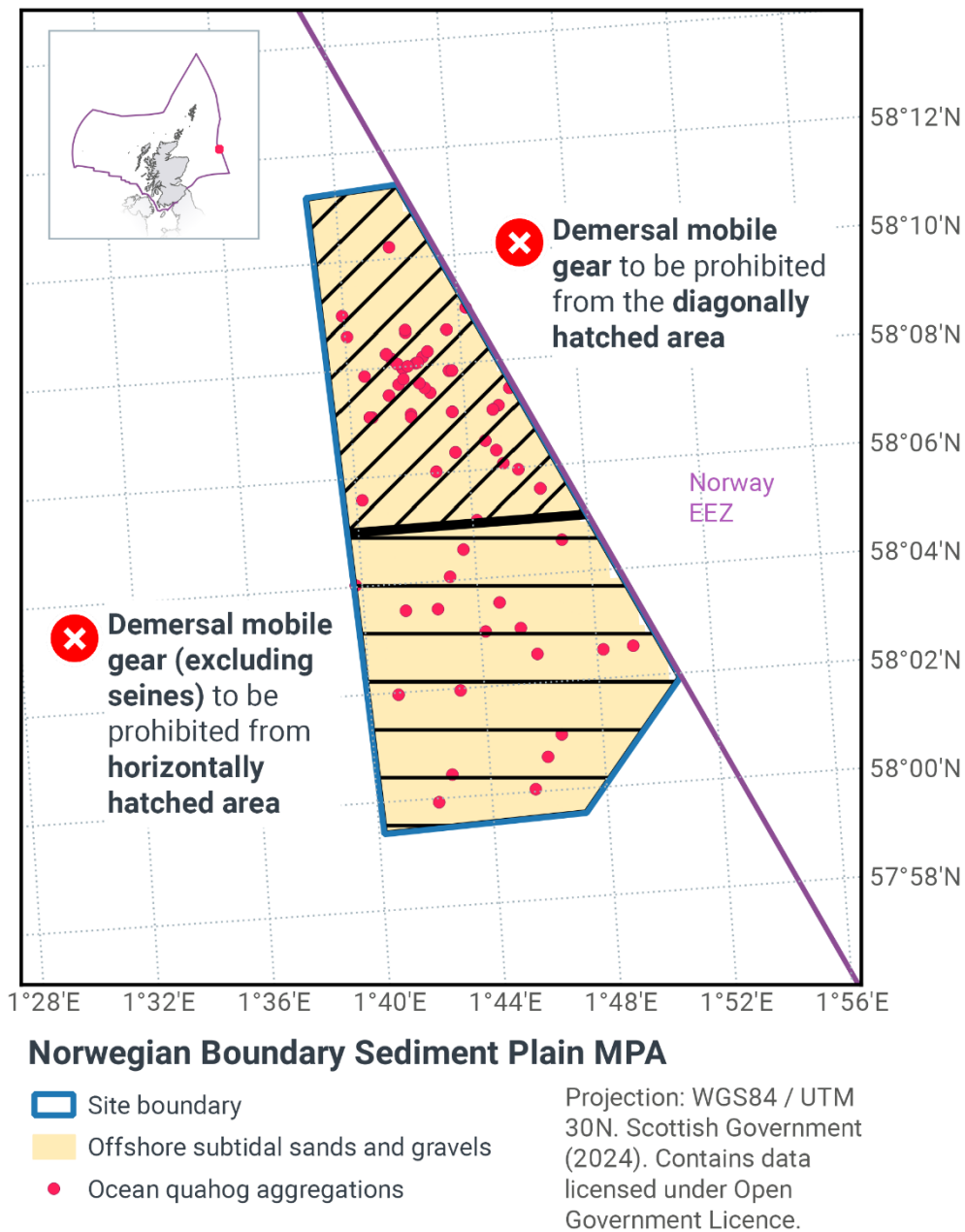


Figure 5. Map showing zonal management measures for Norwegian Boundary Sediment Plain NCMPA.

5.2.3 Full site exclusion

A full site exclusion for mobile demersal gears would remove/avoid all pressures associated with fishing activities across the whole site (Figure 6). This would support the achievement of the conservation objectives of the NCMPA.

The full site exclusion of mobile demersal gear would contribute to the ecological coherence of both the Scottish NCMPA Network and the broader OSPAR MPA Network. These measures would make a significant contribution towards recovery of the species. They should also further progress towards Good Environmental Status in the Greater North Sea, particularly in relation to Descriptors 1 (biological diversity) and 6 (sea-floor integrity).

Given the available evidence, Scottish Ministers consider that full site exclusion would not hinder the achievement of the conservation objectives for the Norwegian Boundary Sediment Plain NCMPA, rather it would further those objectives.

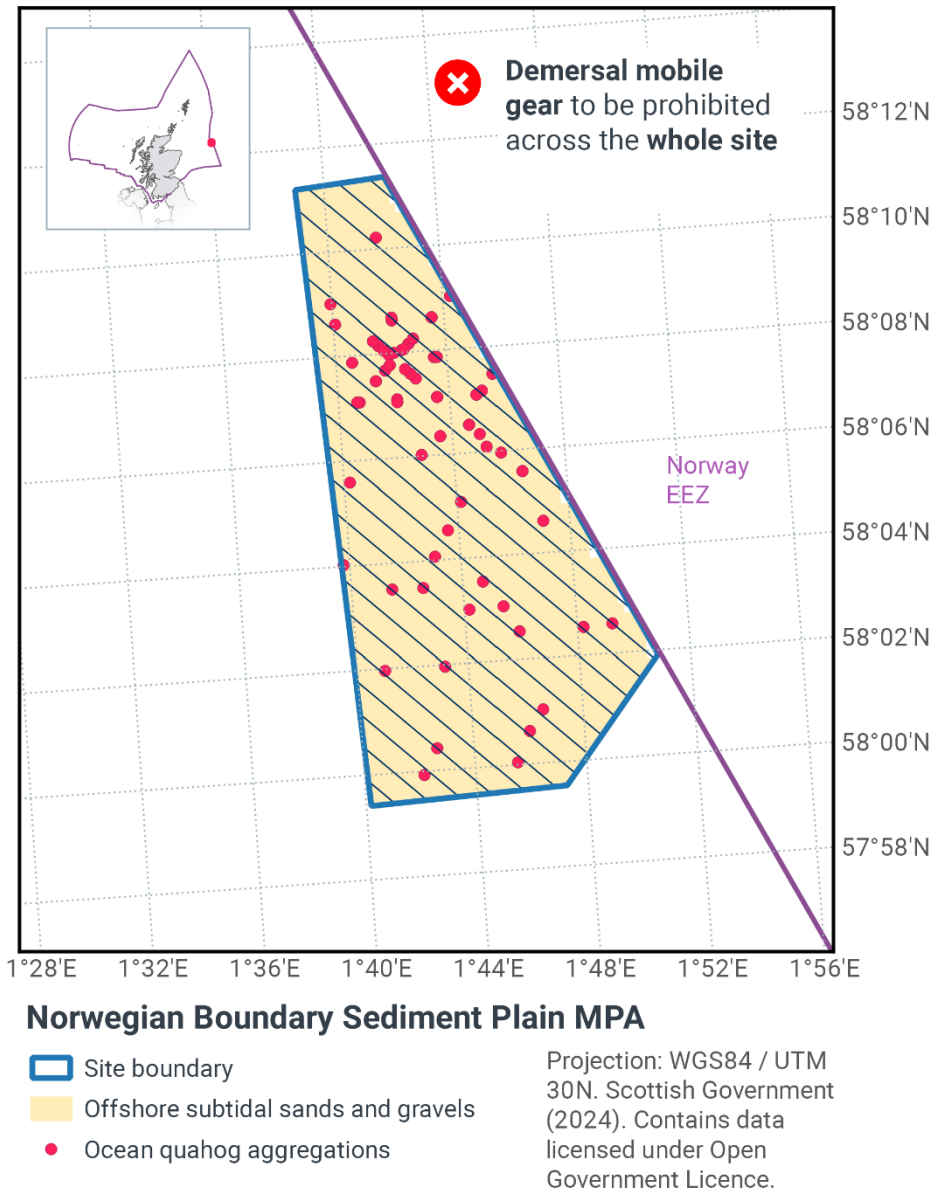


Figure 6. Map showing full site exclusion management measures for Norwegian Boundary Sediment Plain NCMPA.

5.3 Management options conclusion

At current activity levels, demersal trawling and demersal seining are not considered to pose a risk to hindering the conservation objectives, however as agreed with stakeholders, a higher level of protection to the protected features should be considered to maintain the status of “least damaged, more natural” within the northern part of The Norwegian Boundary Sediment Plain NCMPA.

As such, Scottish Ministers consider that fisheries management measures should be considered for the site. Scottish Ministers consider that both the zoned management measures and the full site exclusion option for demersal mobile fishing, outline above, would further the conservation objectives.

The decision on which management option is to be taken forward will be taken in the light of all relevant duties incumbent upon the Scottish Ministers in relation to the exercise of their functions and following upon a statutory public consultation exercise in which views on the options under consideration are invited.

6. Monitoring and review

Scottish Ministers will review this assessment as required. A review of this assessment may be required in response to updated conservation advice; updated advice on the condition of the feature; new information on the sensitivity of the feature to pressures arising from activities within the site; or information on changes in fishing activity within the site.

To coordinate the collection and analysis of information regarding activity levels, and to ensure that any required management is put in place, a monitoring and control plan may be developed for this site.

7. Conclusion

In regard to best available evidence, Scottish Ministers conclude that, provided that appropriate management measures for fishing activities identified above are implemented, any remaining fishing activities would not hinder the conservation objectives of this Nature Conservation Marine Protected Area.

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