Habitats Regulations Assessment document: NMSPA – tLSE 006

European Marine Site:	**Northumberland Marine SPA**
Generic sub-feature(s):	**Pursuit and Plunge diving birds, Benthic feeding birds, Water column**
Gear type(s):	**Light otter trawls**
NIFCA tLSE type:	**Detailed**
Gear/feature interaction reference(s):	**NMSPA – 022** **NMSPA – 023** **NMSPA - 024**

Revision history		
Date	***Revision***	***Editor***
05/06/2018	Document created	NW
19/10/2023	Document revised	KO
30/10/2023	QA	AA
31/10/2023	Document revised	KO
10/11/2023	In-comb added and document ready for final QA	KO
23/11/23	Document reviewed	AA
28/11/2023	Changes made, ready to send to MMO	KO
15/01/2024	Corrected the NIFCA intertidal info in the in-comb assessment	KO
23/02/2024	Edits after receiving the MMO comments	KO
08/07/2024	NE comments addressed	SR
08/08/2024	MMO nursery and spawning grounds wording added	SR
01/10/2024	Approved by MMO (Charlie Wiseman)	SR
28/10/2024	Approved by NE (Pete Welby & Catherine Scott)	SR
04//11/2024	Document finalised	SR

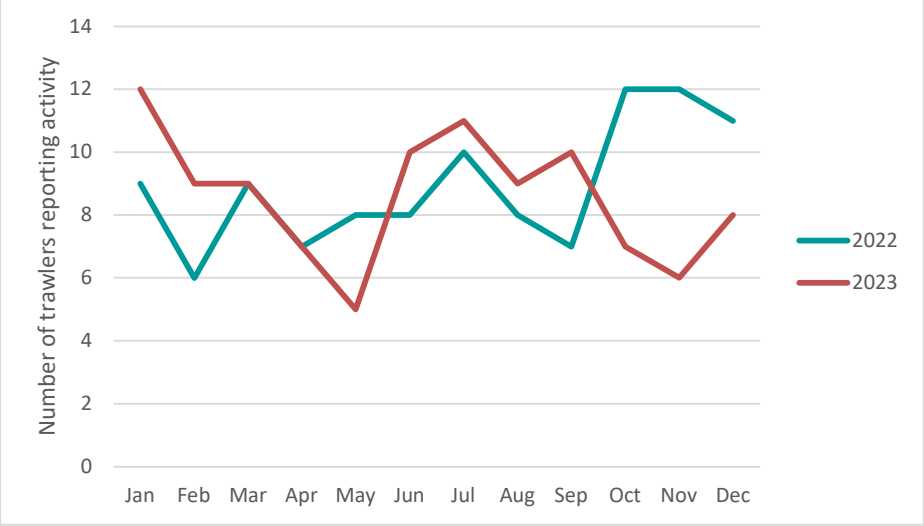
Circulation		
Date	***Sent to***	***Comments received***
05/12/2023	Marine Management Organisation	22/02/2024
08/03/2024	Natural England	11/06/2024
15/08/2024	Marine Management Organisation	01/10/2024
01/10/2024	Natural England	28/10/2024

Test for Likely Significant Effect (LSE)

NMSPA-022 - Pursuit and Plunge diving birds (Puffins, guillemots, Northern fulmars and razorbills)

1. Is the activity/activities directly connected with or necessary to the management of the site for nature conservation?	No
2. What pressures (such as abrasion, disturbance) are potentially exerted by the gear type(s)? *Sensitivities have been categorised as medium-high risk for this feature in draft conservation advice These sensitivities have been taken from the breeding guillemot and puffin features of the SPA.	Changes in suspended solids (water clarity) (Sensitive)* Removal of non-target species (Sensitive)* Above water noise (Sensitive) Collision ABOVE water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures) (Sensitive) Collision BELOW water with static or moving objects not naturally found in the marine environment (Sensitive) Hydrocarbon & PAH contamination (Not-assessed) Introduction of light (Sensitive) Introduction or spread of invasive non-indigenous species (INIS) (Sensitive) Litter (Sensitive) Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals) (Not-assessed) Transition elements & organo-metal (e.g. TBT) contamination (Not assessed) Underwater noise changes (Sensitive) Visual disturbance (Sensitive)
3. Is the feature potentially exposed to the pressure(s)?	Yes

4. What are the conservation objectives for the feature? The listed Conservation Objectives refer specifically to the breeding guillemot and puffin features of the SPA.	**Conservation objectives for plunge & pursuit diving birds:** **Maintain:** - the size of the breeding population - safe passage of birds moving between nesting and feeding areas - [Maintain or recover] productivity so that breeding success is maximised within the constraints of the site. - concentrations and deposition of air pollutants to below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk) - the structure, function and supporting processes associated with the feature and its supporting habitat through management or other measures (whether within and/or outside the site boundary as appropriate) and ensure these measures are not being undermined or compromised. - the extent, distribution and availability of suitable habitat (either within or outside the site boundary) which supports the feature for all necessary stages of its breeding cycle (courtship, nesting, feeding): baseline is not known at present - the distribution, abundance and availability of key food and prey items (e.g. sandeel, whiting, herring, sprat) at preferred prey sizes - the dissolved oxygen (DO) concentration to levels equating to High Ecological Status - 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 - natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat. - **Restrict:** the frequency, duration and / or intensity of disturbance affecting roosting, nesting, foraging, feeding, moulting and/or loafing birds so that they are not significantly disturbed - **Reduce:** aqueous contaminants to levels equating to High Status

5. What are the potential effects/impacts of the pressure(s) on the feature, taking into account the exposure level? ***(reference to conservation objectives)***	Trawling within the NIFCA district is with light otter trawls only and subject to conditions in the byelaw 'Trawling,' which was updated in 2021. Only single trawls are permitted, vessel size is restricted to 12m (0-3nm) or 18.3m (3-6nm) and permit holders must also submit monthly catch returns to NIFCA. In 2023 NIFCA issued 45 permits to trawl, compared to 48 in 2022. However, many of these vessels fish further offshore, beyond the District and SPA boundaries. The number of trawlers reporting activity in the NIFCA District each month in 2022 and 2023 is shown in Figure 1. Vessels numbers ranged from 5-12. Boats are mainly targeting prawns (*Nephrop*s) as well as cod and whiting. Other landed species include haddock, monkfish, plaice, dover sole, lemon sole, turbot, brill and squid. A minimum mesh size of 90mm is required for targeting *Nephrops* and demersal fish would not be targeted with mesh size any smaller than 80mm. Generally, winter is when visiting trawlers fish in the NIFCA District and the number of active trawlers would be expected to be higher during this season. The protected seabirds in this site are breeding seabirds, which means they will be using the area from February to August, but not be present in significant numbers during the winter. However, 2022 and 2023 show different patterns, in 2022 the number of vessels reporting activity increased in the winter with the opposite pattern recorded in 2023. These data only show the number of vessels reporting activity in the District and doesn't reflect the levels of activity or effort. In 2022 for each active vessel the number of days fished in the District per month ranged from 1-24 (average 8.2), whilst in 2023 it ranged from 1-25 days (average 8.9).  **Figure 1** Number of trawlers reporting activity in the NIFCA District (2022 and 2023) (NIFCA permit returns data) Figure 2 is a weighted heatmap of trawling sightings from NIFCA patrol vessels (2018-22) incorporating patrol vessel tracks to give

sightings per unit effort (SPUE) in 1km squares. These data show that the focus of trawling is in the south of the District, with the majority of activity outside of the boundary of the SPA. The seabird breeding colonies underlying the SPA are primarily in the northern end of the SPA, significantly reducing the probability of interaction with trawling vessels. These sightings data only include trawl vessels which are actively fishing rather than being 'in transit'.

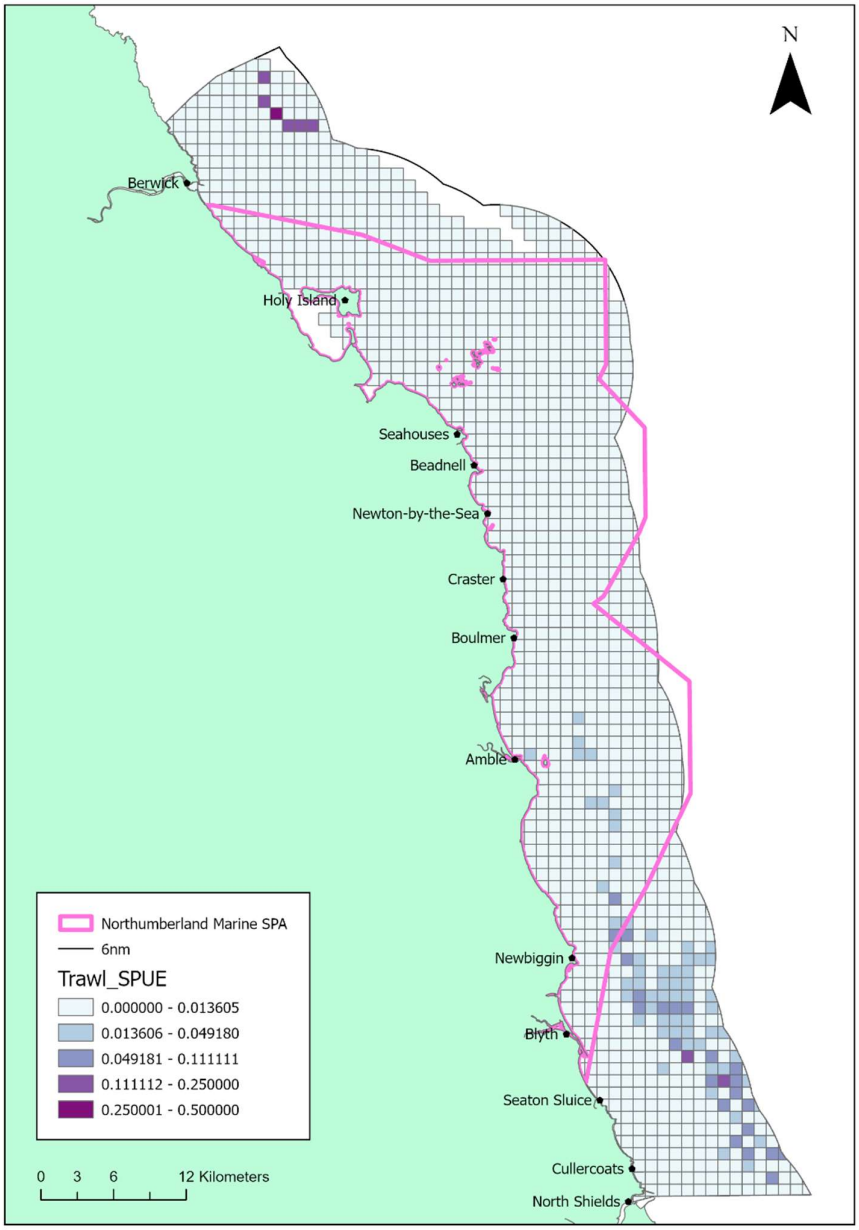


Figure 2 Heatmap showing trawling sightings in the District (2018-22), weighted by NIFCA Patrol Vessel tracks. Data is presented as Sightings Per Unit Effort (SPUE) and mapped in 1km squares. Northumberland Marine SPA is shown by the pink line.

Two of the breeding sites (Lindisfarne SPA and the Farne Islands SPA) underlying the Northumberland Marine SPA fall within the Berwickshire and North Northumberland Coast (BNNC) SAC (Maps

	in Annex). Mobile fishing gear is prohibited in the BNNC SAC except for three small areas which can be fished with light otter trawl gear only, with an authorisation from NIFCA, although there has been no trawling activity in these sites since they opened in 2017. Going forward the implementation of iVMS will give NIFCA more accurate information about trawling in the District. The third breeding site (Coquet Island SPA) falls within Coquet to St Marys (CSM) MCZ. An exemption from NIFCA is also required to trawl within CSM MCZ using light otter trawl gear only. In 2022, four vessels reported trawling activity within Coquet to St Marys MCZ. The fourth site (Northumbria Coast SPA) is a fragmented site, falling within both BNNC SAC and CSM MCZ. There are two areas of the SPA that extend outside of the NIFCA District and the Marine Management Organisation (MMO) has provided activity data related to demersal trawling in these areas. Estimated landings data from the UK under 12m fleet from these areas was 3.21 tonnes in 2021 and 2.24 tonnes in 2020. Average annual landing from these areas from UK under 12m vessels (2012-21) is 3.62 tonnes (MMO data, pers comms). These catches suggest activity in the two areas is very low. Trawling has the potential to impact the bird features of the SPA through the removal of non-target species and presenting a collision risk, which could **alter the size of the breeding population** and hinder **safe passage of birds moving between nesting and feeding areas.** Trawling in the district is demersal, which means the most likely time for interaction between the fishing gear and seabirds is when the nets are being hauled. There is little evidence about bird bycatch in bottom trawl fisheries in the North sea, although shearwaters, cormorants, shags, gulls and gannets have been caught in North Atlantic bottom trawl fisheries (ICES, 14-18 October 2013). However, NIFCA are not aware of any significant bycatch issues with the trawl fishery in the District. Should any issues become apparent then NIFCA will investigate, this will be monitored through the monitoring and control plan process. Trawling does have the potential to cause some displacement of birds on the surface through visual disturbance. However, due to the focus of trawling in the south of the District, significant displacement of the protected bird species is considered unlikely. Trawling could catch the preferred prey species of the seabirds, affecting the **availability of key prey species (e.g. sandeel, whiting herring, sprat) at preferred prey sizes.** Trawling in the NIFCA District is targeted primarily at *Nephrops* and large white finfish and flatfish. The minimum mesh size will be at least 80mm to target prawns and fish of legal landing size (i.e.85mm for prawns, 35cm for cod) which is too large to catch the primarily small fish (sandeels, herring, sprat) that the seabirds feed on. Trawling is therefore unlikely to have a significant effect on the preferred prey species on seabirds.

	Northumberland Marine SPA encompasses large shallow inlets and bays in addition to the Aln, Coquet, Wansbeck and Blyth estuaries. These areas are thought to support the nursery and spawning grounds of sandeel, herring, sprat and whiting, the target prey of the qualifying seabird features in the SPA (Natural England, 2023). NIFCA studies have identified juvenile fish using The Aln Estuary, Long Nanny River and Druridge Bay as potential nursery grounds based upon the size classes of each species found in the studies (Smart & Rae, 2023. Wallace, N, 2015). These key prey species are not targeted commercially within the SPA, however, around 13 tons of whiting is landed per annum as bycatch from nephrops trawling. Sandeel is broadly the preferred prey of the bird features within the SPA (Eglington & Perrow, 2018). The closure of the UK sandeel fishery on April 1st, 2024 in UK waters may provide potential increases in prey availability for the protected bird features within the site. However, prior to the closure in 2024 there were no records of a fishery targeting sandeel within the district. Trawling is unlikely to have any significant impact on the spawning and nursery grounds of the preferred prey species of the listed seabirds. Relatively low levels of trawling will not significantly alter features of the water column through deoxygenation, the introduction of contaminants or organic enrichment. The water column in Northumberland Marine SPA is a highly dynamic marine environment, with strong wave and tidal movements, making it less susceptible to any small-scale changes. However, trawling may temporarily cause changes in suspended solids, affecting water clarity and bird's ability to see well underwater, which could affect visually foraging birds These effects are likely to be short term after the activity has taken place, although should be a consideration if the amount of trawling in the SPA were to increase significantly. Trawling levels are monitored by NIFCA annually through the Monitoring and Control plan which considers the number of active vessels, spatial extent, gear and mesh size. Trigger levels are set for significant changes in these parameters and if these are met then the cause and its impact will be investigated by NIFCA. Trawling will not cause any significant litter in the SPA. Fishing vessels below 45m are required to have permanent ballast, which reduces the risk of non-native species introduction from potting. In addition, within the NIFCA section of the MPA most boats are local to the north-east, so the introduction of new non-native species on vessels is unlikely. Seabirds are susceptible to light pollution in dark environments. However, the introduction of light from trawl vessels operating in the MPA is not considered to pose a significant risk to the seabird features of the MPA. These boats have small deck lights and are

	operating in a coastal environment where light pollution from the shore may already present. Likewise, trawling will cause some underwater noise, but this will be short term and unlikely to impact the seabird features of the SPA.
6. Condition and Conservation Objective Inferences	'Pursuit and plunge feeding' birds refers specifically to guillemots, puffins, northern fulmars and razorbills in the Northumberland Marine SPA. Guillemots and puffins are designated features of the SPA, whilst fulmars and razorbills make up part of the 'Breeding seabird assemblage.' All of these species are designated as breeding features in the SPA, which means birds will be present in high numbers during the breeding season (February to August) before dispersing more widely. Population numbers in the Conservation Advice are from 2015 (Natural England, 2015). ▪ Puffins - 108, 484 breeding adults ▪ Guillemots – 65,751 breeding adults ▪ Northern fulmar - 682 breeding adults ▪ Razorbill – 572 breeding adults The Conservation Advice package does not give feature condition for these species. However, seabird species have been badly hit by Avian Influenza during the last two breeding seasons (2022 and 2023). The Farne Islands are home to approximately 200,000 seabirds. In the most recent breeding season (2023) the National Trust have collected 3,647 dead birds but estimate 30,000+ may have died at sea. In 2022, National Trust rangers on the island collected over 6,000 dead birds. Cliff nesting birds were hit particularly badly on the Farne Islands in 2022 and kittiwakes and large gulls in 2023 (National Trust, 2023). Bird flu will have had impacted both population number and breeding success of multiple species in the SPA, as there has been a high mortality of adult birds. Data is not yet available to show the full impact at the four main breeding sites that make up the SPA.

7. Is the potential scale or magnitude of any effect likely to be significant?	**Alone:** **No.** Due to the focus of trawling in the south of the District, the lack of reports of seabird bycatch and the mismatch between target species and the seabird's prey NIFCA concludes with high confidence that trawling does not pose a risk to the features of the SPA. This will be monitored through the monitoring and control plan process and any significant increase in trawling levels will trigger a reassessment in the SPA.	**OR In-combination** **No.** See 'in-combination' assessment below.
8. Have NE been consulted on this LSE test? If yes, what was NE's advice?	Yes, NE have been consulted throughout the process and approved this LSE.	

NMSPA-023 - Benthic feeding birds (European shag and Great cormorant)

1. Is the activity/activities directly connected with or necessary to the management of the site for nature conservation?	No
2. What pressures (such as abrasion, disturbance) are potentially exerted by the gear type(s)? There is no specific mention of 'benthic feeding birds' in the Advice on Operations. Therefore these sensitivities have been taken from the benthic seabird (eider duck) feature in Lindisfarne SPA to 'demersal trawl.' *Sensitivities have been categorised as medium-high risk for this feature	Changes in suspended solids (water clarity) (Insufficient evidence) Removal of non-target species (Sensitive)* Above water noise (Sensitive) Collision ABOVE water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures) Collision BELOW water with static or moving objects not naturally found in the marine environment (Sensitive) Hydrocarbon & PAH contamination (Not-assessed) Introduction of light (Sensitive) Litter (Sensitive) Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals) (Not-assessed) Transition elements & organo-metal (e.g. TBT) contamination (Not-assessed) Visual disturbance (Sensitive)
3. Is the feature potentially exposed to the pressure(s)?	Yes

4. What are the conservation objectives for the feature? There are no specific Conservation Objectives for 'benthic feeding birds' in the Conservation Advice. Therefore these Conservation Objectives have been taken from the listed seabird features of Northumberland Marine SPA.	**Conservation objectives for benthic feeding birds:** **Maintain:** - the size of the breeding population - safe passage of birds moving between nesting and feeding areas - concentrations and deposition of air pollutants to below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk) - the structure, function and supporting processes associated with the feature and its supporting habitat through management or other measures (whether within and/or outside the site boundary as appropriate) and ensure these measures are not being undermined or compromised. - the extent, distribution and availability of suitable habitat (either within or outside the site boundary) which supports the feature for all necessary stages of its breeding cycle (courtship, nesting, feeding): baseline is not known at present - the distribution, abundance and availability of key food and prey items at preferred prey sizes - the dissolved oxygen (DO) concentration to levels equating to High Ecological Status - 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 - natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat. - **Restrict:** the frequency, duration and / or intensity of disturbance affecting roosting, nesting, foraging, feeding, moulting and/or loafing birds so that they are not significantly disturbed **Reduce:** aqueous contaminants to levels equating to High Status

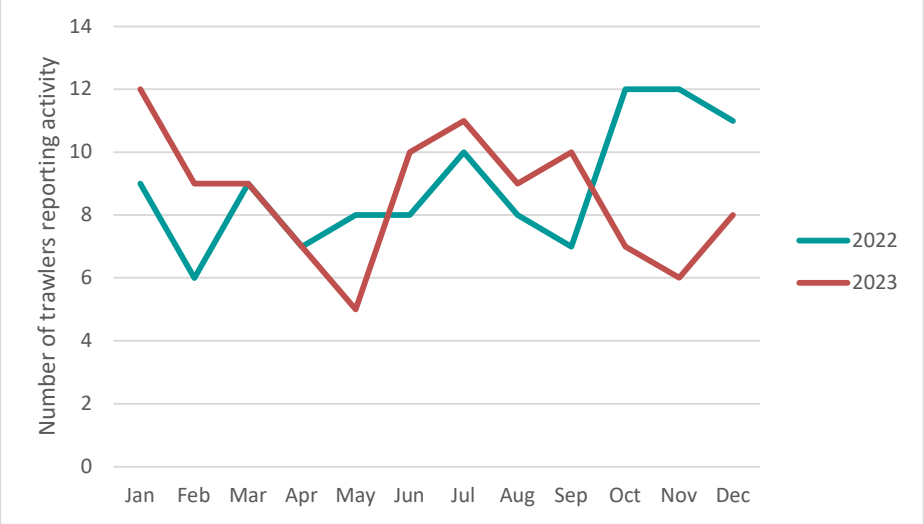
5. What are the potential effects/impacts of the pressure(s) on the feature, taking into account the exposure level? ***(reference to conservation objectives)***	Trawling within the NIFCA district is with light otter trawls only and subject to conditions in the byelaw 'Trawling,' which was updated in 2021. Only single trawls are permitted, vessel size is restricted to 12m (0-3nm) or 18.3m (3-6nm) and permit holders must also submit monthly catch returns to NIFCA. In 2023 NIFCA issued 45 permits to trawl, compared to 48 in 2022. However, many of these vessels fish further offshore, beyond the District and SPA boundaries. The number of trawlers reporting activity in the NIFCA District each month in 2022 and 2023 is shown in Figure 1. Vessels numbers ranged from 5-12. Boats are mainly targeting prawns (*Nephrop*s) as well as cod and whiting. Other landed species include haddock, monkfish, plaice, dover sole, lemon sole, turbot, brill and squid. A minimum mesh size of 90mm is required for targeting *Nephrops* and demersal fish would not be targeted with mesh size any smaller than 80mm. Generally, winter is when visiting trawlers fish in the NIFCA District and the number of active trawlers would be expected to be higher during this season. The protected seabirds in this site are breeding seabirds, which means they will be using the area from February to August, but not be present in significant numbers during the winter. However, 2022 and 2023 show different patterns, in 2022 the number of vessels reporting activity increased in the winter with the opposite pattern recorded in 2023. These data only show the number of vessels reporting activity in the District and doesn't reflect the levels of activity or effort. In 2022 for each active vessel the number of days fished in the District per month ranged from 1-24 (average 8.2), whilst in 2023 it ranged from 1-25 days (average 8.9).  **Figure 2** Number of trawlers reporting activity in the NIFCA District (2022 and 2023) (NIFCA permit returns data)

Figure 2 is a weighted heatmap of trawling sightings from NIFCA patrol vessels (2018-22) incorporating patrol vessel tracks to give sightings per unit effort (SPUE) in 1km squares. These data show that the focus of trawling is in the south of the District, with the majority of activity outside of the boundary of the SPA. The seabird breeding colonies underlying the SPA are primarily in the northern end of the SPA, significantly reducing the probability of interaction with trawling vessels. These sightings data only include trawl vessels which are actively fishing rather than being 'in transit'.

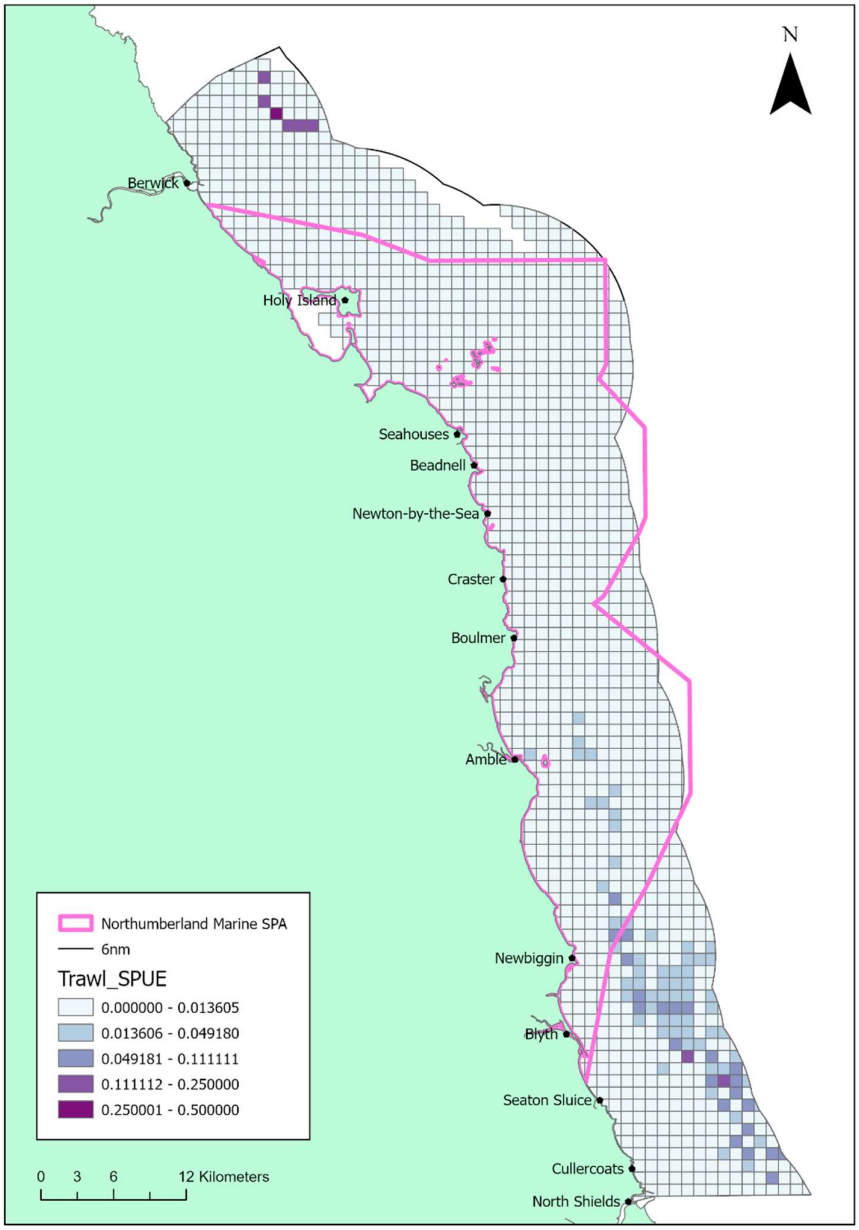


Figure 2 Heatmap showing trawling sightings in the District (2018-22), weighted by NIFCA Patrol Vessel tracks. Data is presented as Sightings Per Unit Effort (SPUE) and mapped in 1km squares. Northumberland Marine SPA is shown by the pink line.

	Two of the breeding sites (Lindisfarne SPA and the Farne Islands SPA) underlying the Northumberland Marine SPA fall within the Berwickshire and North Northumberland Coast (BNNC) SAC (Maps in Annex). Mobile fishing gear is prohibited in the BNNC SAC except for three small areas which can be fished with light otter trawl gear only, with an authorisation from NIFCA, although there has been no trawling activity in these sites since they opened in 2017. Going forward the implementation of iVMS will give NIFCA more accurate information about trawling in the District. The third breeding site (Coquet Island SPA) falls within Coquet to St Marys (CSM) MCZ. An exemption from NIFCA is also required to trawl within CSM MCZ using light otter trawl gear only. In 2022, four vessels reported trawling activity within Coquet to St Marys MCZ. The fourth site (Northumbria Coast SPA) is a fragmented site, falling within both BNNC SAC and CSM MCZ. There are two areas of the SPA that extend outside of the NIFCA District and the Marine Management Organisation (MMO) has provided activity data related to demersal trawling in these areas. Estimated landings data from the UK under 12m fleet from these areas was 3.21 tonnes in 2021 and 2.24 tonnes in 2020. Average annual landing from these areas from UK under 12m vessels (2012-21) is 3.62 tonnes (MMO data, pers comms). These catches suggest activity in the two areas is very low. Trawling has the potential to impact the bird features of the SPA through the removal of non-target species and presenting a collision risk, which could **alter the size of the breeding population** and hinder **safe passage of birds moving between nesting and feeding areas.** Trawling in the district is demersal, which means the most likely time for interaction between the fishing gear and seabirds is when the nets are being hauled. There is little evidence about bird bycatch in bottom trawl fisheries in the North sea, although shearwaters, cormorants, shags, gulls and gannets have been caught in North Atlantic bottom trawl fisheries (ICES, 14-18 October 2013). However, NIFCA are not aware of any significant bycatch issues with the trawl fishery in the District. Should any issues become apparent then NIFCA will investigate. Trawling does have the potential to cause some displacement of birds on the surface through visual disturbance. However, due to the focus of trawling in the south of the District, significant displacement of the protected bird species is considered unlikely. Trawling could also catch the birds prey species, affecting the **availability of key prey species at preferred prey sizes.** Shags and cormorants both have a varied diet. Shags are considered to feed primarily on benthic, schooling and demersal fish (Natural England, 2012). Long term studies of breeding shags at Canna (west coast of Scotland) show sandeels and Gadid fish such as cod to make up the majority of the birds diet (Swann, Harris, & Aiton, 2008).

	Studies on the Isles of May again found sandeels to dominate adult and chick diet, with a range of finfish and fragmented remains of crustaceans (prawns and hermit crabs) also present (Harris & Wanless, 2009). Cormorants primarily feed on benthic fish species, but do also take pelagic fish and crustaceans (Natural England, 2012). European shags and great cormorants are therefore able to exploit a wide variety of prey, mainly benthic fish. Trawling in the NIFCA District is targeted primarily at *Nephrops* and large white finfish and flatfish. The minimum mesh size will be at least 80mm, which is too large to catch the primarily small fish that seabirds feed on e.g. sandeels and small whitefish. Trawling is therefore unlikely to have a significant effect on the preferred prey species on seabirds. Northumberland Marine SPA encompasses large shallow inlets and bays in addition to the Aln, Coquet, Wansbeck and Blyth estuaries. These areas are thought to support the nursery and spawning grounds of sandeel, herring, sprat and whiting, the target prey of the qualifying seabird features in the SPA (Natural England, 2023). NIFCA studies have identified juvenile fish using The Aln Estuary, Long Nanny River and Druridge Bay as potential nursery grounds based upon the size classes of each species found in the studies (Smart & Rae, 2023. Wallace, N, 2015). These key prey species are not targeted commercially within the SPA, however, around 13 tons of whiting is landed per annum as bycatch from nephrops trawling. Sandeel is broadly the preferred prey of the bird features within the SPA (Eglington & Perrow, 2018). The closure of the UK sandeel fishery on April 1st, 2024 in UK waters may provide potential increases in prey availability for the protected bird features within the site. However, prior to the closure in 2024 there were no records of a fishery targeting sandeel within the district. Trawling is unlikely to have any significant impact on the spawning and nursery grounds of the preferred prey species of the listed seabirds. Relatively low levels of trawling will not significantly alter features of the water column through deoxygenation, the introduction of contaminants or organic enrichment. The water column in Northumberland Marine SPA is a highly dynamic marine environment, with strong wave and tidal movements, making it less susceptible to any small-scale changes. However, trawling may temporarily cause changes in suspended solids, affecting water clarity and bird's ability to see well underwater, which could affect visually foraging birds These effects are likely to be short term after the activity has taken place, although should be a consideration if the amount of trawling in the SPA were to increase significantly. Trawling levels are monitored by NIFCA annually through the Monitoring and Control plan which considers the number of active vessels, spatial extent, gear and mesh size. Trigger levels are set for significant changes in these parameters and if these are met then the cause

	and its impact will be investigated by NIFCA. Trawling should not cause any significant litter in the SPA. Fishing vessels below 45m are required to have permanent ballast, which reduces the risk of non-native species introduction from potting. In addition, within the NIFCA section of the MPA most boats are local to the north-east, so the introduction of new non-native species on vessels is unlikely. Seabirds are susceptible to light pollution in dark environments. However, the introduction of light from netting vessels operating in the MPA is not considered to pose a significant risk to the seabird features of the MPA. These boats have small deck lights and are operating in a coastal environment where light pollution from the shore may already present. Likewise, netting will cause some underwater noise, but this will be short term and unlikely to impact the seabird features of the SPA.
6. Condition and Conservation Objective Inferences	Benthic feeding birds are not specifically designated in the SPA, they make up part of the 'breeding seabird assemblage.' The following species are listed as 'main components' in the Conservation Advice: Arctic tern, common tern, roseate tern, Sandwich tern, little tern, Atlantic puffin, common guillemot, great cormorant, European shag, black-headed gull and black-legged kittiwake. Of these species European shags and great cormorants are considered benthic feeding birds. These species are designated as breeding features in the SPA, which means birds will be present in high numbers during the breeding season (February to August) before dispersing more widely. Population numbers are from 2015 (Natural England, 2015). ▪ European shag – 1,677 ▪ Great cormorant – 230 The Farne Islands and the Isles of Scilly are the two largest shag breeding colonies in England (Natural England, 2012). The Conservation Advice package does not give feature condition for these species. However, seabird species have been badly hit by Avian Influenza during the last two breeding seasons (2022 and 2023). The Farne Islands are home to approximately 200,000 seabirds. In the most recent breeding season (2023) the National Trust have collected 3,647 dead birds, but estimate 30,000+ may have died at sea. In 2022 National Trust rangers on the island collected over 6,000 dead birds. Cliff nesting birds were hit particularly badly on the Farne Islands in 2022 and kittiwakes and large gulls in 2023 (National Trust, 2023). Bird flu will have had impacted both population number and breeding success of multiple species in the SPA, as there has been a high mortality of adult birds. Data is not yet available to show the full impact at the four main breeding sites that make up the SPA.

7. Is the potential scale or magnitude of any effect likely to be significant?	**Alone:** **No.** Due to the focus of trawling in the south of the District, the lack of reports of seabird bycatch and the mismatch between target species and the seabird's prey NIFCA concludes with high confidence that trawling does not pose a risk to the features of the SPA. This will be monitored through the monitoring and control plan process and any significant increase in trawling levels will trigger a reassessment in the SPA.	**OR In-combination** **No.** See below for 'in-combination' assessment.
8. Have NE been consulted on this LSE test? If yes, what was NE's advice?	Yes, NE have been consulted throughout the process and approved this LSE.	

NMSPA-024 - Water column

1. Is the activity/activities directly connected with or necessary to the management of the site for nature conservation?	No

2. What pressures (such as abrasion, disturbance) are potentially exerted by the gear type(s)? *Sensitivities have been categorised as medium-high risk for this feature.	Changes in suspended solids (water clarity) (Sensitive)* Removal of non-target species (Sensitive)* Removal of target species (Sensitive)* Deoxygenation (Sensitive) Hydrocarbon and PAH contamination (Not-assessed) Introduction of light (Sensitive) Introduction or spread of invasive non-indigenous species (INIS) (Sensitive) Litter (Sensitive) Nutrient enrichment (Sensitive) Organic enrichment (Sensitive) Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals) (Not assessed) Transition elements & organo-metal (e.g. TBT) contamination (Not-assessed) Underwater noise changes (Sensitive) Visual disturbance (Sensitive)
3. Is the feature potentially exposed to the pressure(s)?	Yes
4. What are the conservation objectives for the feature?	

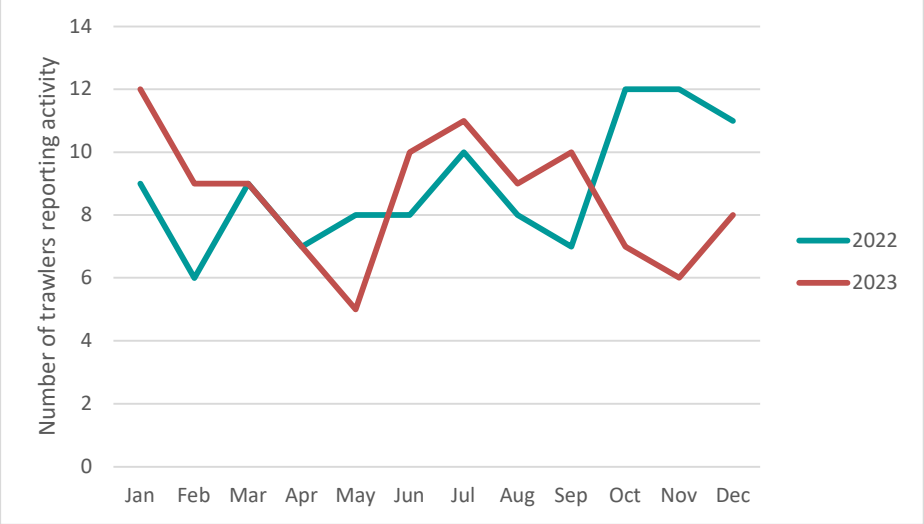
5. What are the potential effects/impacts of the pressure(s) on the feature, taking into account the exposure level? ***(reference to conservation objectives)***	Trawling within the NIFCA district is with light otter trawls only and subject to conditions in the byelaw 'Trawling,' which was updated in 2021. Only single trawls are permitted, vessel size is restricted to 12m (0-3nm) or 18.3m (3-6nm) and permit holders must also submit monthly catch returns to NIFCA. In 2023 NIFCA issued 45 permits to trawl, compared to 48 in 2022. However, many of these vessels fish further offshore, beyond the District and SPA boundaries. The number of trawlers reporting activity in the NIFCA District each month in 2022 and 2023 is shown in Figure 1. Vessels numbers ranged from 5-12. Boats are mainly targeting prawns (*Nephrop*s) as well as cod and whiting. Other landed species include haddock, monkfish, plaice, dover sole, lemon sole, turbot, brill and squid. A minimum mesh size of 90mm is required for targeting *Nephrops* and demersal fish would not be targeted with mesh size any smaller than 80mm. Generally, winter is when visiting trawlers fish in the NIFCA District and the number of active trawlers would be expected to be higher during this season. The protected seabirds in this site are breeding seabirds, which means they will be using the area from February to August, but not be present in significant numbers during the winter. However, 2022 and 2023 show different patterns, in 2022 the number of vessels reporting activity increased in the winter with the opposite pattern recorded in 2023. These data only show the number of vessels reporting activity in the District and doesn't reflect the levels of activity or effort. In 2022 for each active vessel the number of days fished in the District per month ranged from 1-24 (average 8.2), whilst in 2023 it ranged from 1-25 days (average 8.9).  **Figure 3** Number of trawlers reporting activity in the NIFCA District (2022 and 2023) (NIFCA permit returns data)

Figure 2 is a weighted heatmap of trawling sightings from NIFCA patrol vessels (2018-22) incorporating patrol vessel tracks to give sightings per unit effort (SPUE) in 1km squares. These data show that the focus of trawling is in the south of the District, with the majority of activity outside of the boundary of the SPA. The seabird breeding colonies underlying the SPA are primarily in the northern end of the SPA, significantly reducing the probability of interaction with trawling vessels. These sightings data only include trawl vessels which are actively fishing rather than being 'in transit'.

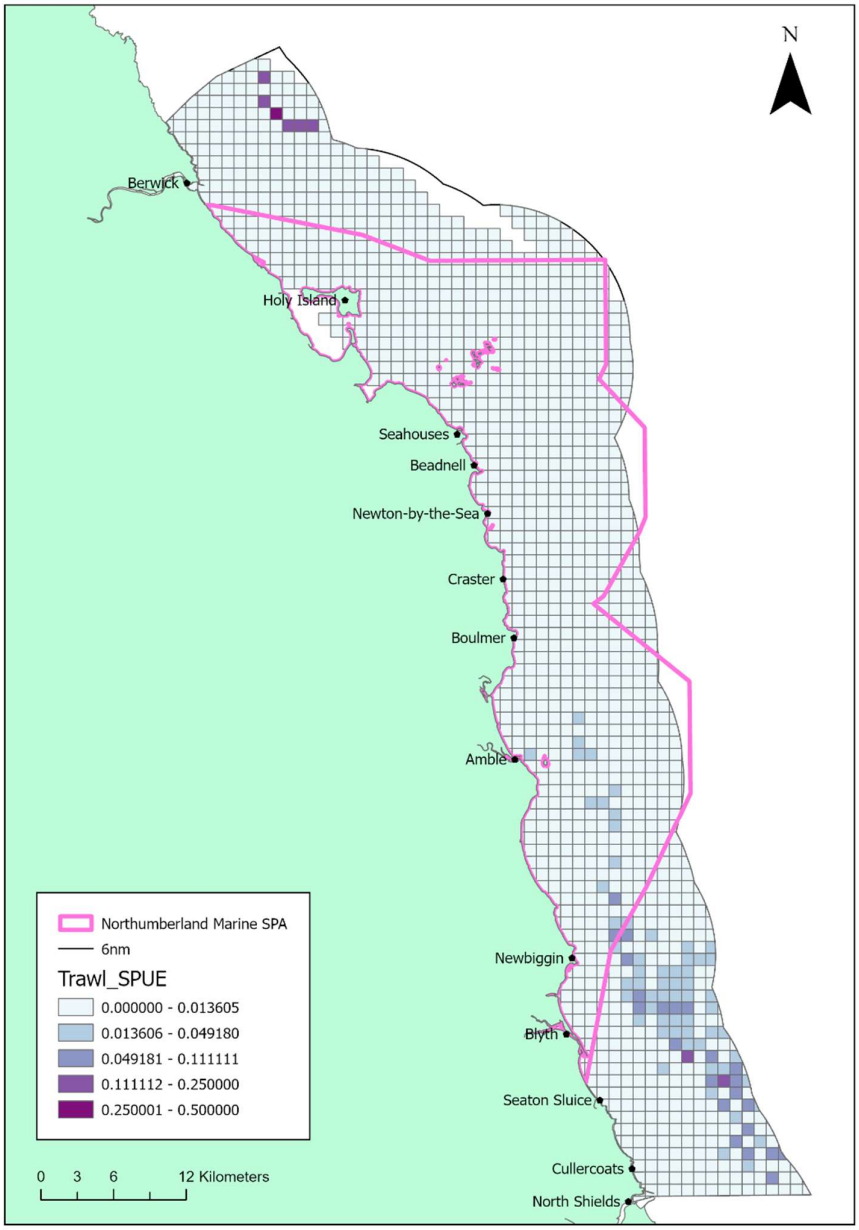


Figure 2 Heatmap showing trawling sightings in the District (2018-22), weighted by NIFCA Patrol Vessel tracks. Data is presented as Sightings Per Unit Effort (SPUE) and mapped in 1km squares. Northumberland Marine SPA is shown by the pink line.

	Two of the breeding sites (Lindisfarne SPA and the Farne Islands SPA) underlying the Northumberland Marine SPA fall within the Berwickshire and North Northumberland Coast (BNNC) SAC (Maps in Annex). Mobile fishing gear is prohibited in the BNNC SAC except for three small areas which can be fished with light otter trawl gear only, with an authorisation from NIFCA, although there has been no trawling activity in these sites since they opened in 2017. Going forward the implementation of iVMS will give NIFCA more accurate information about trawling in the District. The third breeding site (Coquet Island SPA) falls within Coquet to St Marys (CSM) MCZ. An exemption from NIFCA is also required to trawl within CSM MCZ using light otter trawl gear only. In 2022, four vessels reported trawling activity within Coquet to St Marys MCZ. The fourth site (Northumbria Coast SPA) is a fragmented site, falling within both BNNC SAC and CSM MCZ. There are two areas of the SPA that extend outside of the NIFCA District and the Marine Management Organisation (MMO) has provided activity data related to demersal trawling in these areas. Estimated landings data from the UK under 12m fleet from these areas was 3.21 tonnes in 2021 and 2.24 tonnes in 2020. Average annual landing from these areas from UK under 12m vessels (2012-21) is 3.62 tonnes (MMO data, pers comms). These catches suggest activity in the two areas is very low. Trawling has the potential to impact the bird features of the SPA through the removal of non-target species and presenting a collision risk, which could **alter the size of the breeding population** and hinder **safe passage of birds moving between nesting and feeding areas.** NIFCA are not aware of any significant bycatch issues with the trawl fishery. Should any issues become apparent then NIFCA would investigate. Trawling does have the potential to cause some displacement of birds on the surface through visual disturbance. However, due to the focus of trawling in the south of the District, significant displacement of the protected bird species is considered very unlikely. Trawling could also catch the birds prey species, affecting the **availability of key prey species (e.g. sandeel, herring, sprat) at preferred prey sizes.** Trawling in the NIFCA District is targeted primarily at *Nephrops* and large white finfish and flatfish. The minimum mesh size will be at least 80mm, which is too large to catch the primarily small fish that seabirds feed on e.g. sandeels, herring and sprat. Trawling is therefore unlikely to have a significant effect on the preferred prey species of seabirds. Northumberland Marine SPA encompasses large shallow inlets and bays in addition to the Aln, Coquet, Wansbeck and Blyth estuaries. These areas are thought to support the nursery and spawning grounds of sandeel, herring, sprat and whiting, the target prey of the

	qualifying seabird features in the SPA (Natural England, 2023). NIFCA studies have identified juvenile fish using The Aln Estuary, Long Nanny River and Druridge Bay as potential nursery grounds based upon the size classes of each species found in the studies (Smart & Rae, 2023. Wallace, N, 2015). These key prey species are not targeted commercially within the SPA, however, around 13 tons of whiting is landed per annum as bycatch from nephrops trawling. Sandeel is broadly the preferred prey of the bird features within the SPA (Eglington & Perrow, 2018). The closure of the UK sandeel fishery on April 1st, 2024 in UK waters may provide potential increases in prey availability for the protected bird features within the site. However, prior to the closure in 2024 there were no records of a fishery targeting sandeel within the district. Trawling is unlikely to have any significant impact on the spawning and nursery grounds of the preferred prey species of the listed seabirds. Relatively low levels of trawling will not significantly alter features of the water column through deoxygenation, the introduction of contaminants or organic enrichment. The water column in Northumberland Marine SPA is a highly dynamic marine environment, with strong wave and tidal movements, making it less susceptible to any small-scale changes. However, trawling may temporarily cause changes in suspended solids, affecting water clarity and bird's ability to see well underwater. These effects are likely to be very short term after the activity has taken place. Trawling will not cause any significant litter. Fishing vessels below 45m are required to have permanent ballast, which reduces the risk of non-native species introduction from potting. In addition, within the NIFCA section of the MPA most boats are local to the north-east, so the introduction of new non-native species on vessels is unlikely. Seabirds are susceptible to light pollution in dark environments. However, the introduction of light from trawling vessels operating in the MPA is not considered to pose a significant
6. Condition and Conservation Objective Inferences	No evidence is available for the current condition of the water column feature within the Northumberland Marine SPA. In lieu of adequate evidence or conservation objectives, a CO of 'Maintain' has been inferred with a 'low' level of confidence.

7. Is the potential scale or magnitude of any effect likely to be significant?	**Alone:** **No.** Due to the focus of trawling in the south of the District, the lack of reports of seabird bycatch and the mismatch between target species and the seabird's prey NIFCA concludes with high confidence that trawling does not pose a risk to the features of the SPA. This will be monitored through the monitoring and control plan process and any significant increase in trawling levels will trigger a reassessment in the SPA.	**OR In-combination** **No.** See below for 'in-combination' assessment.
8. Have NE been consulted on this LSE test? If yes, what was NE's advice?	Yes, NE have been consulted throughout the process and approved this LSE**.**	

In-Combination Assessment

Potential risks of in-combination effects have been considered in Table 2 listing other fisheries, current and possible plans/projects and other activities within the site.

In summary, trawling within Northumberland Marine SPA is not deemed to have a likely significant effect on the protected bird features in combination with other activities.

Table 2 *In-combination assessment of trawling with other activities within Northumberland Marine SPA.*

Fishing Activity			
Activity	**Description**	**Potential Pressure**	**Assessment**
Fixed nets on subtidal ground	Fixed nets (gill nets and trammel nets) are anchored to the seabed, with a floating headline and used to target white fish (cod) and flatfish in the NIFCA District. These nets will be set on firm sediment ground, likely near wrecks for cod, but on sandy ground for flatfish. Only one vessel	This activity occurs at a very low level for sea fish across the NIFCA District, largely due to the lack of white fish and grey seal predation from nets. NIFCA are currently aware of one vessel from Amble which may set fixed nets in the SPA area. From NIFCA shellfish permit returns data only 4-5 vessels have reported	Fixed netting occurs at very low levels in the NIFCA District. Netters will also avoid setting their gear where mobile fishers operate, as gear loss has financial consequences. Due to the very low levels of fixed netting activity NIFCA can say with high confidence that

	is thought to set tangle nets for crustaceans. Fixed nets will not generally be set on rocky ground as there is a high risk of damage to the nets. Fixed netting is managed by the Fixed Engines Byelaw which NIFCA is in the process of updating (January 2024). Fixed netting in the District for migratory fish (sea trout) is managed and assessed by the Environment Agency.	setting nets in the District each year (2020-22). Whilst this permit returns data cannot be considered a complete record (as not all boats have shellfish permits) it reflects the low level of fixed netting Fixed netting has the potential to impact the bird features through bycatch, or by removing their preferred prey species.	fixed netting activity 'in-combination' with trawling will not increase pressures on bird features of the SPA.
Potting on subtidal rocky ground, with low levels on subtidal sediment ground and intertidal rocky ground	Potting for European lobster (*Homarus gammarus)* and brown crab (*Cancer pagurus)* is the principal fishery within the NIFCA district. Most fishers in the district use parlour pots of various sizes and pots are typically worked in fleets of 10-40, dependant on the size of the vessel. Potting occurs predominantly in and around rocky habitat for lobster and brown crab, with some potting on subtidal mud for *Nephrops* and brown crab.	In 2023 NIFCA issued 85 Commercial Shellfish Permits to fishers, compared to 93 in 2022, 108 in 2021 and 98 in 2020. The total number of pot hauls in the District was 2,464,412 in 2022, compared to 2,766, 681 in 2021 and 2,750,768 in 2020. Pots are limited to 800 per shellfish permit and the fishery is governed by multiple IFCA byelaws. In the NIFCA district recreational potting also occurs and numbers are monitored through a permit system. A permit allows fishers to use 5 pots, which must be fitted with escape gaps. In 2023 273 recreational permits were issued. There are two areas of the SPA that stretch outside of the NIFCA District and the Marine Management Organisation (MMO) has provided activity data related to potting in these areas. In 2021, 5.56 tonnes was landed from pots by UK under 12m vessels, in 2020 5.9 tonnes was landed. Species are not listed so	Potting activity is unlikely to co-occur with trawling in the SPA. Potting is primarily targeted on subtidal rocky ground, with low levels of activity on intertidal rock and subtidal sediment ground. Trawling occurs on sediment ground, primarily mud. In addition, potters will avoid the areas where mobile fishers operate as gear loss has financial consequences. Due to the spatial mismatch with potting NIFCA does not consider that at current levels 'in-combination' trawling and potting are likely to significantly increase the pressures on bird features in the site.

		this likely includes lobster, crabs and N*ephrops*. Average annual landings from UK vessels in these areas (2012-21) is 6.78 tonnes (MMO landings data, pers comm).	
Hand work (access from land) in the intertidal	Hand work encompasses a wide variety of fishing methods, including; angling, periwinkle collection, 'cleeking' for lobster and hand gathering of mussels/crabs. These activities occur across the NIFCA district and since 2016 NIFCA officers have been collecting information on shore-based activity two hours either side of low tide, including 'no activity'. There are also a small number of patrols in the SPA from partner organisations during the same tidal periods (n=13).	Within Northumberland Marine SPA 657 patrols have been made between October 2016 and September 2023. Some areas of the District are visited more frequently by Officers, therefore sightings per unit effort (SPUE) has been calculated for each location. Sites listed are where the activity has been seen on at least 10% of patrols and there have been at least 10 patrols to the site. ▪ **Angling**; Amble, Blyth, Beadnell, Druridge Bay, Lynemouth, Newbiggin, Cresswell, Cambois and Hauxley. ▪ **Periwinkle collection**; Boulmer south, Cambois, Holy Island, Cresswell, Beadnell, Boulmer north, Hauxley, Hadston, Lynemouth ▪ **Bait collection** has been recorded on 44 patrols in the SPA. Forty-one of these patrols were at Blyth. ▪ **Cleeking**; Boulmer south, Creswell and Newbiggin. Shore-based activity has the potential to impact the bird features through visual/noise disturbance and the removal of prey species.	There will be no spatial overlap between trawling and any shore-based fishing activity. NIFCA can therefore conclude with high confidence that 'in-combination' trawling and shore-based activity will not increase pressures on the bird features of the SPA.
Crab tiling	Crab tiling involves placing objects (tyres, tiles, piping) into the intertidal, which crabs	Within Northumberland Marine SPA 657 patrols have been made between October 2016 and	There will be no spatial overlap between crab tiling and trawling nor are these activities

	will use for shelter. Collectors then check these objects at low tide and remove green shore crabs. NIFCA officers record any intertidal fishing activity observed during routine patrols whenever a site visit coincides with low water (± 2 hours), as well as 'no activity.' There are also a small number of patrols in the SPA from partner organisations during the same tidal periods (n=13).	September 2023. Crab tiling has been observed on 5% of these patrols (33/657). Crab tiling has only been recorded at three sites; Blyth, Alnmouth and the Wansbeck estuary. Of these sites the activity has been recorded 30 times at Blyth, twice in the Wansbeck and once in the Aln. However, NIFCA has also conducted surveys for crab tiling equipment in the Aln, Blyth, Wansbeck and at Amble. All sites had at least 50 tyres present in 2020.	targeting the same species. NIFCA can therefore conclude with high confidence that 'in-combination' trawling and crab tiling will not increase pressures on the bird features of the SPA.
Digging with forks in the intertidal	Digging with forks entails collecting worms from the intertidal at low tide, primarily lugworms and ragworms. This activity occurs in estuaries across the NIFCA district. NIFCA officers record any intertidal fishing activity observed during routine patrols whenever a site visit coincides with low water (± 2 hours), as well as 'no activity.' There are also a small number of patrols in the SPA from partner organisations during the same tidal periods (n=13).	Within Northumberland Marine SPA 657 patrols have been made between October 2016 and September 2023. Bait digging has been observed on 19.6% of these patrols (129/657). Some areas of the District are visited more frequently by Officers, therefore sightings per unit effort (SPUE) has been calculated for each location (no. of times activity observed/site visits). Sites where bait digging has been observed on over 10% of patrols and at least 10 patrols occurred include; Boulmer North, Hadston, Hauxley, Blyth, Newton and Boulmer South. Bait digging activity has a seasonal aspect and SPUE is highest from September-January, outside of the seabird breeding season.	There will be no spatial overlap between bait digging and trawling, nor are these activities targeting the same species. NIFCA can therefore conclude with high confidence that 'in-combination' trawling and bait digging will not increase pressures on the bird features of the SPA.

		Digging with forks has the potential to impact the bird features through visual/noise disturbance and the removal of prey species.	

Non-fishing Activity

Activity	Description	Potential Pressure	Assessment
Mine water discharge	Abandoned mines are one of the biggest sources of water pollution by metals. There is a mine water treatment scheme at Lynemouth and groundwater upwellings have occurred at Hauxley/Hadston as well as water pumped from a mine, discharged through an existing outfall at Hauxley.	Sediments and invertebrate communities could be negatively impacted by mine water discharges. This could occur where mine water is not treated before release into the marine environment. In the majority of cases significant mine water outflow is identified and treated by the Coal Authority.	Appropriate licence conditions/monitoring has been incorporated to mitigate any impacts.

Active Marine Licences

Project number	Brief description	Assessment
MLA/2023/00158	Hydrophone deployment for monitoring cetaceans	All marine licence applications are assessed to ensure appropriate licence conditions/monitoring are in place. These assessments must consider impacts to Marine Protected Areas, with an aim to preferably avoid, then minimise and mitigate impacts to the protected features. NIFCA are consulted on all relevant marine applications, as are other bodies such as Natural England.
MLA/2023/00017	Deployment of cetacean acoustic monitoring device off Craster	
MLA/2023/00094	Bore hole back-filling	
MLA/2020/00458	Construction of telecommunications pipeline	
MLA/2019/00109	Maintenance of Newbiggin coastal wave buoy	
MLA/2019/00319	Rock installation	
MLA/2019/00521	Maintenance and upgrade of pontoon at Amble	
Multiple licenses	Blyth windfarm (construction of 15 turbines). Work is set to continue after the installation of the initial five.	

Conclusion

Is the proposal likely to have a significant effect 'alone or in combination' on the Northumberland Marine SPA?

No. Due to the concentration of trawling in the south of the District, the majority of activity taking place outside of Northumberland Marine SPA and a lack of reports of seabird bycatch NIFCA does

not currently consider that trawling poses a risk to the bird features of the SPA. This will be monitored through the monitoring and control plan process and any significant increase in trawling levels will trigger a reassessment in the SPA.

Have the MMO been formally consulted on this tLSE (and do they agree)?	**Yes, MMO been formally consulted on this tLSE and agree with the conclusions.** Charlie Wiseman, Principal Marine Conservation Manager, MMO
Has Natural England been formally consulted on this tLSE (and do they agree)?	Yes, NE have been consulted throughout the process and approved this LSE.

Date of document completion/'sign-off':	**04/11/2024**

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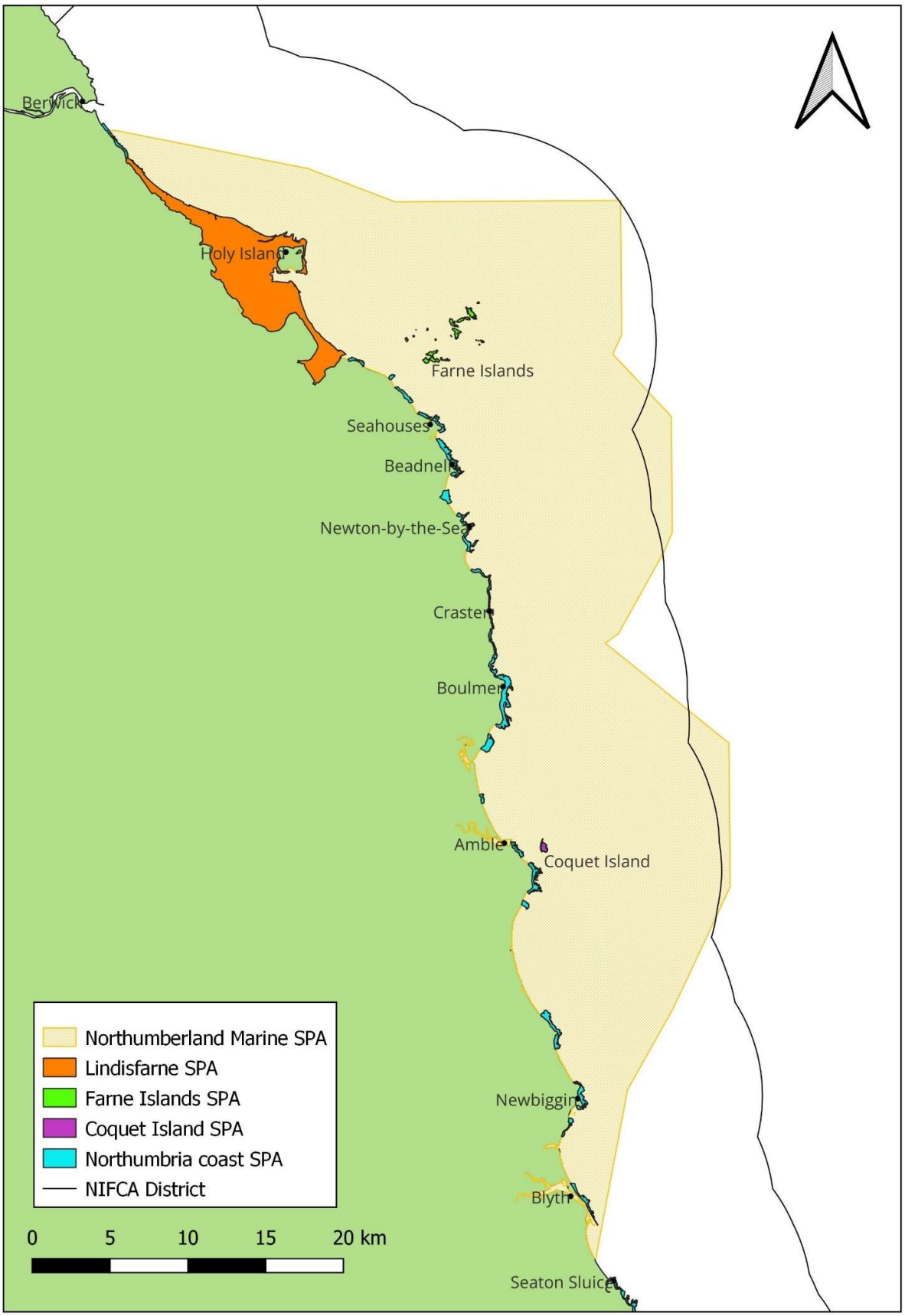
Annex 1 Location of Northumberland Marine SPA and co-located SPAs



Annex 2 Location of Northumberland Marine SPA, BNNC SAC and CSM MCZ