Appropriate Assessment document FHEMS-AA-02

European Marine Site:	**Flamborough Head SAC** **Flamborough Head and Bempton Cliffs SPA** **Flamborough and Filey Coast pSPA**	
Feature / sub-feature / supporting habitat:	**Subtidal faunal turf communities**	**FHEMS-tLSE-07**
	Kelp forest communities	
	Regularly occurring migratory species for which the site supports over 1% of the biogeographical population	
	Seabird assemblage	
Gear type(s):	**Static – Fixed Nets**	

Revision history		
Date	***Revision***	***Editor***
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Contents

1. Introduction

1.1 Need for an HRA assessment

In 2012, the Department for Environment, Food and Rural Affairs (Defra) announced a revised approach to the management of commercial fisheries in European Marine Sites (EMS). The objective of this revised approach is to ensure that all existing and potential commercial fishing activities are managed in accordance with Article 6 of the Habitats Directive.

This approach is being implemented using an evidence based, risk-prioritised, and phased basis. Risk prioritisation is informed by using a matrix of the generic sensitivity of the sub-features of EMS to a suite of fishing activities as a decision making tool. These sub-feature-activity combinations have been categorised according to specific definitions, as red, amber, green or blue.

Activity/feature interactions identified within the matrix as red risk have the highest priority for implementation of management measures by the end of 2013 in order to avoid the deterioration of Annex I features in line with obligations under Article 6(2) of the Habitats Directive.

Activity/feature interactions identified within the matrix as amber risk require a site-level assessment to determine whether management of an activity is required to conserve site features. Activity/feature interactions identified within the matrix as green also require a site level assessment if there are "in combination effects" with other plans or projects.

Site level assessments are being carried out in a manner that is consistent with the provisions of Article 6(3) of the Habitats Directive. The aim of this assessment is to determine whether management measures are required in order to ensure that fishing activity or activities will have no adverse effect on the integrity of the site. If measures are required, the revised approach requires these to be implemented by 2016.

1.2 Documents reviewed to inform this assessment

- Natural England's risk assessment Matrix of fishing activities and European habitat features and protected species[1]
- Reference list (Annex 1)
- Natural England's formal consultation response[2]
- Site map(s) – sub-feature/feature location and extent
- Fishing activity data (map(s), etc)
- Fisheries Impact Evidence Database (FIED)

[1] See Fisheries in EMS matrix: http://www.marinemanagement.org.uk/protecting/conservation/documents/ems_fisheries/populated_matrix3.xls

[2] Natural England Reference: Casework Tracker 186779

1.3 Prioritisation rationale

Adaptive Risk Management as a component of the ecosystem-based approach to management, integrating conservation and fisheries management objectives, is central to sustainable development of the marine environment. As such, this review is meant to be an iterative process. Fishing is a dynamic industry with changing patterns of effort and new commercial fisheries developing. It is the role of the regulators to assess these changes over time and to implement management should adverse effects be expected or determined.

Assessments are based on the best available evidence at the time, including peer reviewed and grey literature, landings and vessel sightings data, Officer knowledge of current activities and expert opinion.

Initially, designated site features and supporting habitats were assigned to one or more generic matrix feature categories allowing a site specific activity/feature matrix to be developed and 'red' risk interactions to be identified. Primary screening identified 'blue' non-occurring interactions and those for which regulations prohibiting an activity were already in force. Individual activity/feature interactions were then grouped for assessment where appropriate and subjected to a test of Likely Significant Effect (tLSE). If the tLSE concluded the potential for significant effect on the condition of the feature then a more detailed Appropriate Assessment (AA) was carried out.

2. Information about the EMS

2.1 Overview and qualifying features

The Flamborough Head European Marine Site (EMS) is an umbrella term for two separate designations; the Flamborough Head Special Area of Conservation (SAC) and the Flamborough and Bempton Cliffs Special Protection Area (SPA). In addition, a potential SPA (pSPA) and a possible SAC (pSAC) are currently in development and are already a material consideration in planning terms. The Flamborough and Filey Coast pSPA incorporates the existing SPA, a new terrestrial area at Filey Brigg and an extension into the 2km of inshore waters surrounding both Flamborough Head and Filey Brigg. The Flamborough Head pSAC includes a terrestrial extension to the boundary of the existing Flamborough Head SAC, however this would not alter the assessment of fisheries impacts.

Special Area of Conservation (SAC) and possible SAC (pSAC)

Annex I habitats that are a primary reason for selection

- **1170 Chalk reefs**
- **8330 Sea caves**
- **1230 Vegetated sea cliffs**

"Flamborough Head has been selected for the presence of species associated with the chalk and for the site's location at the southern limit of distribution of several northern species. It lies close to the biogeographic boundary between two North Sea waterbodies and encompasses a large area of hard and soft chalk on the east coast of England. The site covers around 14% of UK and 9% of European coastal chalk exposure, represents the most northern outcrop of chalk in the UK, and includes bedrock and boulder reefs which extend further into deeper water than at other subtidal chalk sites in the UK, giving one of the

most extensive areas of sublittoral chalk in Europe. The reefs and cliffs on the north side of the headland are very hard, resulting in, for example, the presence of many overhangs and vertical faces, a feature uncommon in sublittoral chalk. The clarity of the relatively unpolluted sea water and the hard nature of the chalk have enabled kelp *Laminaria hyperborea* forests to become established in the shallow sublittoral. The reefs to the north support a different range of species from those on the slightly softer and more sheltered south side of the headland. The site supports an unusual range of marine species and includes rich animal communities and some species that are at the southern limit of their North Sea distribution, e.g. the northern alga *Ptilota plumosa*. For these reasons, the sublittoral and littoral reef habitats at Flamborough are considered to be the most diverse in the UK."[3]

Special Protection Area (SPA) and potential SPA (pSPA)

Flamborough Head and Bempton Cliffs SPA (FHBC SPA)
The site qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting over 1% of the biogeographical population of regularly occurring migratory species.

- **Black-legged kittiwake, *Rissa tridactyla***

The site supports nationally important populations of seabirds:

- **Common guillemot, *Uria aalge***
- **Razorbill, *Alca torda***
- **Atlantic puffin, *Fratercula arctica***

Flamborough and Filey Coast pSPA (FFC pSPA)
The site qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting over 1% of the biogeographical population of four regularly occurring migratory species.

- **Black-legged kittiwake, *Rissa tridactyla***
- **Northern gannet, *Morus bassanus***
- **Common guillemot, *Uria aalge***
- **Razorbill, *Alca torda***

The site qualifies under Article 4.2 of the Directive (79/409/EEC) as it is used regularly by over 20,000 seabirds in any season.

"The cliffs of Flamborough Head rise to 135 metres and are composed of chalk and other sedimentary rocks. These soft cliffs have been eroded into a series of bays, arches, pinnacles and gullies with an extensive system of caves at sea-level. The cliffs from Filey Brigg to Cunstone Nab comprise a range of sedimentary rocks including shales and sandstones. The cliff top vegetation comprises maritime grassland vegetation growing alongside species more typical of chalk grassland. The intertidal area below the cliffs is predominantly rocky and part of reefs that extend into the subtidal area. The adjacent sea out to 2 km off Flamborough Head as well as Filey Brigg to Cunstone Nab is characterised by chalk reefs comprising kelp forest communities in the shallow subtidal and faunal turf communities below 2 metre water depths. The southern site of Filey Brigg shelves off gently from the rocks to the sand bottom of the Bay. During the breeding season, the area regularly supports 215,750 individual seabirds including: black-legged kittiwake, northern gannet, common guillemot, razorbill, northern fulmar *Fulmarus glacialis* (2008-2012)." (Natural England, 2013)

[3] http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUCode=UK0013036 Accessed on 17/11/15

2.2 EMS features subject to this assessment

FHEMS-tLSE-07 highlighted the potential for significant effect on features of the EMS from static netting. These include:

- Reefs, to include the sub-features:
  - Kelp forest communities
  - Subtidal faunal turf

- The regularly occurring migratory species for which the site supports over 1% of the biogeographical population, namely:
  - Black-legged kittiwake – *Rissa tridactyla*
  - Gannet – *Morus bassanus*
  - Guillemot – *Uria aalge*
  - Razorbill – *Alca torda*

- Seabird assemblage:
  - Northern fulmar – *Fulmarus glacialis (a named component of the assemblage, with over 2000 individuals present)*
  - Atlantic Puffin – *Fratercula arctica*
  - Great Cormorant – *Phalacrocorax carbo*
  - European shag – *Phalacrocorax aristotelis*

2.3 Conservation Objectives

SAC/pSAC[4]

Subject to natural change, maintain the reefs in favourable condition, in particular:
- Subtidal faunal turf communities
- Kelp forest communities

SPA/pSPA[5]

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the favourable conservation status of its qualifying features, by maintaining or restoring;
- The extent and distribution of the habitats of the qualifying features
- The structure and function (including typical species) of qualifying natural habitats and features
- The supporting processes on which the habitats of the qualifying features rely
- The population of each of the qualifying features, and
- The distribution of the qualifying features within the site.

[4] http://publications.naturalengland.org.uk/publication/3048908 Accessed on 22/12/2015
[5] http://publications.naturalengland.org.uk/publication/5511099672690688 Accessed on22/12/2015

3. Fishing activity characterisations

3.1 Current management

Static netting in the NEIFCA District is managed through **Byelaw XVIII Fixed Engine Byelaw**. Netting within the 5m depth contour is prohibited at all times and within the 10 meter depth contour is subject to a temporal prohibition between the 26th March and the 31st October. A minimum headline clearance of 4m to the water surface at any state of tide applies at all times.

Area C as defined in **Byelaw XVIII** runs along the Holderness coast from Flamborough Head lighthouse to Withernsea light and is open to a permitted sole and sea bass net fishery (Figure 1). A total of 5 intertidal and 5 subtidal permits are issued annually to fish in Area C between the 15th of October and the 30th of April under a list of specified conditions. Nets must be single un-armoured sheets (gill rather than trammel) with a mesh size of 100mm, be cleared at least once in every 24 hour period and have acoustic cetacean deterrents attached in order to reduce incidental by-catch. Permit holders are able to target sole between the 1st May and the 30th June under a further derogation with similar conditions placed on the fishery although nets can only be 1m in height. It is a further condition of both the bass and sole fisheries that they provide accurate catch returns to the Authority including any seabird or marine mammal by-catch. Area C was developed in consultation with fishermen and a 'gentleman's agreement' was made not to net in the vicinity of the cliffs where the birds nest during the breeding season. The 5 intertidal bass/sole permits are the only intertidal nets allowed with the NEIFCA District.

A No Take Zone (NTZ) situated on the south of the headland (Figure 1) was designated in 2010 and prohibits the use of any instrument or method of fishing for the removal or taking of seafish (including shellfish).

3.2 Characterisation and distribution of effort

The static net fishery in the NEIFCA District can be described as a seasonal fishery with vessels targeting cod specifically during the winter months with mixed whitefish/flatfish providing the target species during the summer period (NEIFCA, 2013). Netting effort tends to be confined within 3nm of the coast (Figure 2) and is carried out by vessels under 10m in length. Aggregations of sightings have been recorded to the north of the EMS around Staithes/Whitby and Sunderland/Seaham. Effort in the NEIFCA District is considered to be low and declining with landings falling from 127 tonnes in 2011 to 16 tonnes in 2014 (Figure 3).

The static net fishery in the area of the EMS (rectangle 37E9) is also considered to be a seasonal fishery (Figure 4), traditionally targeting cod in the winter months and to a lesser extent mixed whitefish/flatfish during the summer. Anecdotal reports from fishermen indicate that lack of quota for fish is a limiting factor for netting effort. Commercial effort within the EMS is very low (Figure 1). None of the intertidal bass permit holders set nets within the EMS or north of Bridlington.

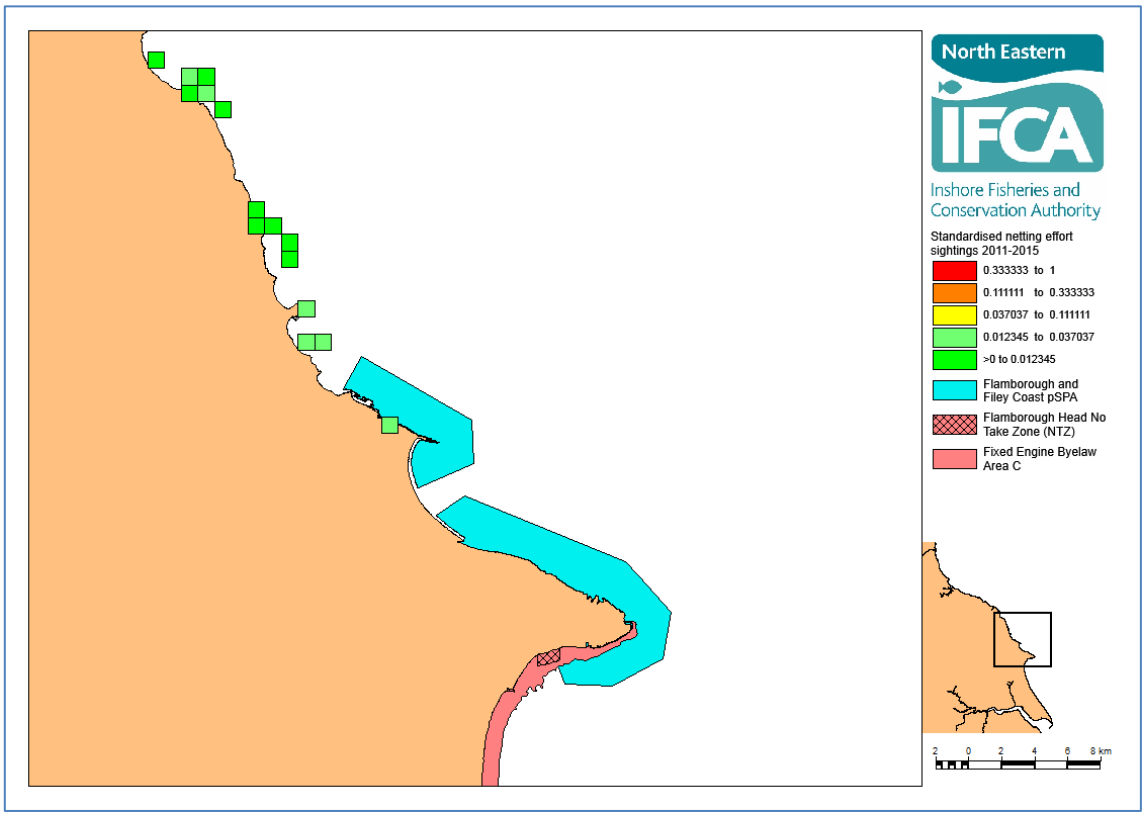

Figure 1. Standardised netting effort sightings (SPUE – sightings per unit effort) in the region of the Flamborough and Filey Coast pSPA for the period 2011 – 2015. See Annex 3 for an explanatory note on the interpretation of sightings data.

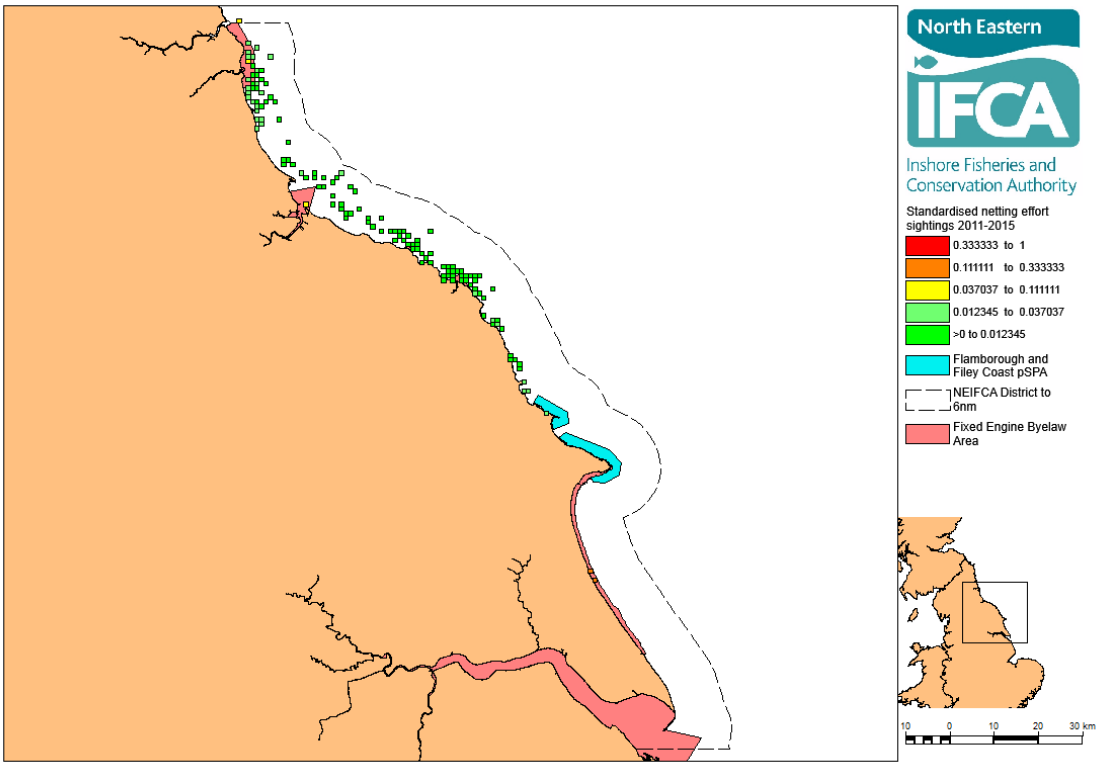

Figure 2. Standardised netting effort sightings (SPUE) in the NEIFCA District for the period 2011 – 2015.

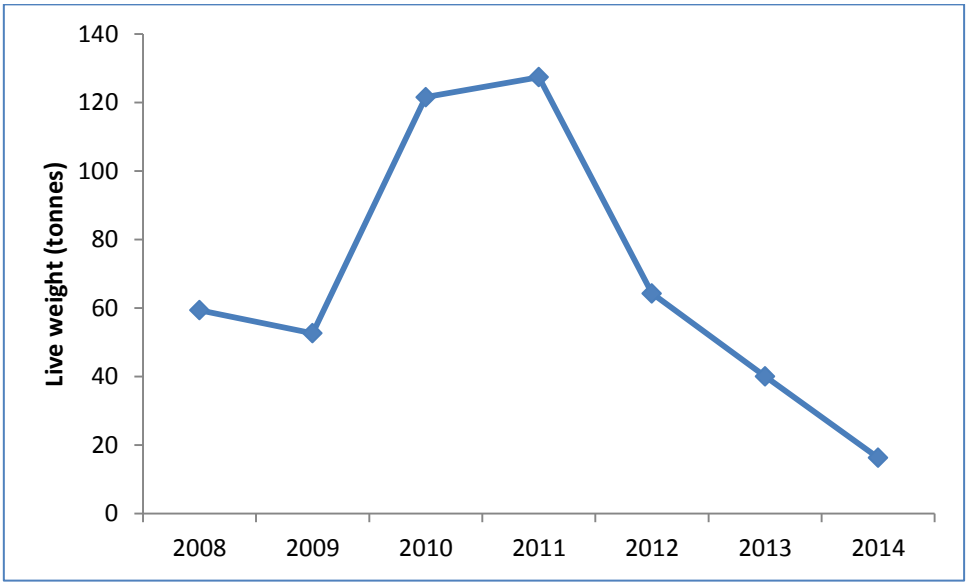

Figure 3. Net caught landings in the NEIFCA District for the period 2008-2014. (Source: MMO, 2016)

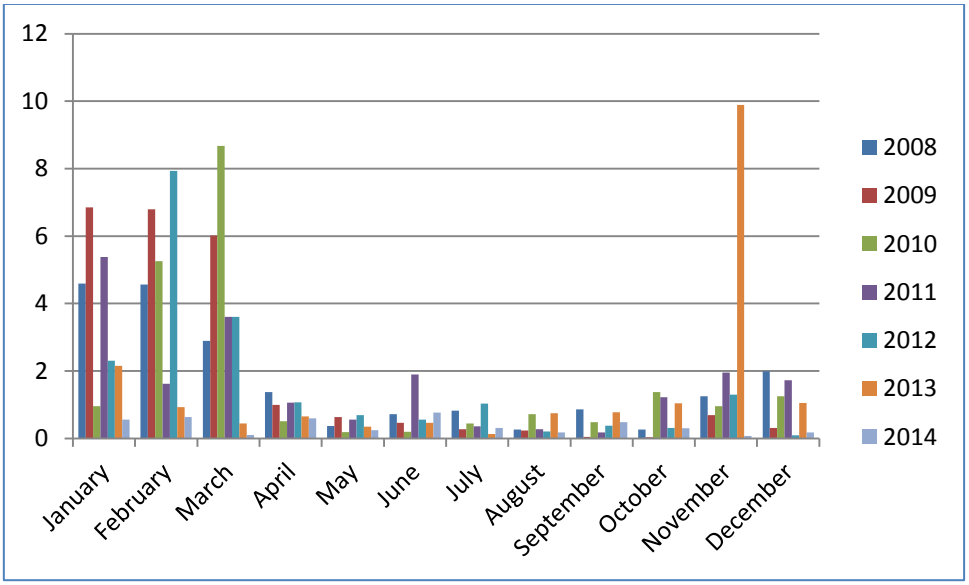

Figure 4. Monthly net caught landings from 37E9 for the period 2008-2014. (Source: MMO, 2016)

4. Test of Likely Significant Effect (LSE)

A Habitats Regulations assessment (HRA) is a step-wise process and is first subject to a coarse test of whether a plan or project will cause a likely significant effect on an EMS[6]. A tLSE for the use of fixed nets in the Flamborough Head EMS was carried out (FHEMS-tLSE-07) and concluded that there was the potential for likely significant effect.

5. Appropriate Assessment

If a tLSE identifies the potential for a significant effect on an EMS feature it is followed by an Appropriate Assessment to determine if the plan or project is likely to have an adverse effect on site integrity. Given the outcome of FHEMS-tLSE-07, this section forms the Appropriate Assessment for commercial fishing using static nets in the Flamborough Head EMS.

[6] Managing Natura 2000 sites: http://ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm Accessed 7/12/15.

5.1 Reef

Physical damage (abrasion/entanglement)

There are very few primary evidence sources that specifically address the physical impacts of static netting on benthic features. Compared to mobile demersal gear, netting has been considered a relatively benign fishing method in terms of potential habitat impacts. Habitat impacts of nets are thought to be similar to potting due to similarities in gear construction and method of use (hauling/retrieval). There is potential for set nets to snag and damage benthic epifauna, particularly during hauling and retrieval.

Roberts *et al*. (2010) considered benthic communities to be relatively unaffected by static fishing gears (pots, long lines or anchored nets) due to the relatively small area of seabed affected. Benthic community biomass in areas subjected to only static gear use has been reported to be significantly greater compared to areas in which trawling has occurred within the last two years (Blyth *et al*., 2004).

Suuronen *et al*. (2012) reported entanglement of benthic species during net retrieval. Shester and Micheli (2011) indicated that within temperate kelp forest habitats set gill nets caused significantly more damage than traps (pots), likely due to tangling with benthic structures/organisms.

Eno *et al*. (2001) concluded that reef fauna were relatively unaffected by potting activities and that the potential ecological impact (abrasion) of netting activities was likely to be similar however nets are considered to be less robust and with greater potential to entangle epifauna.

There is the potential for entanglement of erect species that form part of the subtidal faunal turf communities such as *Alcyonium digitatum* and elements of the kelp forest communities. Within the Flamborough Head SAC, kelp forest communities are found in shallow waters to a maximum depth of 5-8m (Davies and Sotheran, 1995). The depth restrictions in **Byelaw XVIII: Fixed Engine Byelaw** significantly reduce the level of risk to this feature. Taking into account the levels of effort within the site, the level of risk to the features is considered to be very low.

Changes in turbidity

While there is potential for the re-suspension of sediment during the deployment and retrieval of nets as they move across the sea floor, the exposure of the site to wave and tidal conditions and the scale of the potential impact in an already naturally turbid environment (Davies & Sotheran, 1995; Wood, 1988) lead to the conclusion that any ecological impacts will be insignificant when compared with natural processes.

5.2 Regularly occurring migratory species and seabird assemblage

Biological disturbance: mortality as by-catch

Marine birds are the most conspicuous and wide ranging organisms in the marine environment. Seabirds are regularly associated with fishing activities, where food resources are the main attraction. Interactions with the fishing industry can be both beneficial and harmful to seabirds, for example, exploitation of fish and offal discards and seabird by-catch occurrences (Tasker *et al*., 2000).

Fixed nets, including gill nets and trammel nets, are recognised worldwide as a cause of incidental seabird by-catch. The behaviour of pursuit and plunge diving birds makes them highly vulnerable to this method of fishing (Žydelis *et al*., 2013). The gill nets and trammel nets used in the NEIFCA district are mainly made

from synthetic material[7] which can be very difficult for birds to see underwater, increasing the likelihood of entanglement (Sewell *et al*., 2007).

Seabird by-catch from fixed nets is well documented (Žydelis *et al*., 2013; Sewell *et al*., 2007, Tasker et al., 2000). Nets that are set within the foraging ranges of birds have the potential to cause incidental by-catch (Tasker *et al*., 2000), the risk of which increases significantly when nets are set in close proximity to breeding sites (Sewell *et al*., 2007, Tasker et al., 2000). The level of by-catch is influenced by the level of fishing activity and abundance of seabirds in the population (Sewell et al., 2007).

Seabirds are present in the Flamborough and Filey Coast pSPA at various times throughout the year, with reports of guillemots returning in January and kittiwakes present in March[8]. Discussions with the RSPB have highlighted the most sensitive time for the pSPA features is from April to September during their breeding season although it is recognised that there is significant uncertainty and variation over when species arrive and depart the site with some species having an almost year round presence . The main food source for gannet, guillemot, razorbill, puffin, cormorant and shag is fish[9], using extensive areas throughout the NEIFCA district and further out to sea to forage for food. The mean diving depth of gannets is 19.7m (Brierley and Fernandez, 2001), cormorants and shags dive to depths of 37m and 30m respectively (Croxall, 1987, Wanless, *et al*., 1993), and for guillemots, razorbills and puffins depths of 180m, 120m and 60m respectively can be reached (Piatt and Nettleship, 1985).

The Filey Bay salmon and sea trout fixed net fishery regulated by the Environment Agency (EA) reported large numbers of auk species by-catch prior to the introduction of mitigation methods such as temporal restrictions, continual monitoring of fishing nets by the fishermen (allowing the rapid release of any entangled birds alive) and use of multifilament leaders enforceable during the breeding period (Baines *et al*., 2013). EA nets are not subject to the depth and headline clearance that other nets are subject to under **Byelaw XVIII**.

Calculating an accurate estimate of the level of by-catch that occurs in the district can be difficult due to under-reporting bird by-catch by the fishing industry (Murray *et al*., 1994). The Filey Bay salmon and sea trout fixed net fisheries found 29% of bird by-catch was not being reported in 2010 despite having a byelaw in place. Compliance did improve with time for this fishery (Baines *et al*., 2013). Studies in Wales and Scotland concluded minimal widespread impact of surface set fixed nets on seabirds based on the seabird population size and the level of fishing activity during that year (Murray *et al*., 1994). The highly productive waters surrounding the Flamborough and Filey Coast pSPA support approximately 215,000 breeding seabirds annually[10]. Anecdotal evidence suggests that even one shot of an illegal bottom set net (<4m headrope clearance) south of Bempton Cliff bird colony can cause high levels of seabird bycatch[11]. The intertidal and subtidal netsmen permitted to fish in Area C (Section 3.) are required to submit accurate catch returns including any bird bycatch, of which none have been reported.

There is currently no management mechanism to control the number/length of fixed nets that can be deployed or the number of vessels that can use nets within the majority of the district. There is also no

[7] NEIFCA officer knowledge.
[8] Personal communication Martin Kerby, Natural England, 21/5/16.
[9] http://www.rspb.org.uk/ Accessed 7/12/15
[10] http://jncc.defra.gov.uk/default.aspx?page=1995 Accessed 23/11/15
[11] NEIFCA Officer J. Wood 24/11/15

formal restriction on the placing of nets in areas adjacent to nesting sites in the Flamborough and Filey Coast pSPA. There are approximately 244 shellfish permit holders and 278 trawl permit holders registered with NEIFCA which all have the potential to fish with a fixed net. Also, transient and nomadic vessels can use fixed nets within the district and within the boundaries of the EMS.

Anecdotal reports from fishermen in the region of the pSPA indicate a reluctance to set nets close to the cliffs because of the potential for seabird by-catch. There is a long-standing 'gentlemen's agreement' developed between fishermen, regulators and NGOs that nets would not be used near the cliffs when birds are present in large numbers. There is limited site specific data available on seabird by-catch numbers because catch returns are not required for this fishery. Results from the seabird monitoring report show favourable productivity from the colonies of gannets, guillemots and razorbills (Aitken et al., 2014), however the fishery is unregulated both spatially and in terms of effort outside the areas described in Section 3.1.

Biological disturbance: competition for food resource

Regional, national and international (EU) technical gear regulations (including mesh sizes) and minimum landing sizes have been implemented to reduce bycatch and the retention of juvenile fish species. The bird features that are the focus of this assessment use a pursuit and plunge diving technique to hunt small schooling fish such as sandeels and clupeids (particularly sprat and herring), although small gadoids can also be an important dietary component[12,13]. Netting in the area targets cod over the winter using nets with a minimum mesh size of 140mm (35cm MLS) and bass and sole over the summer using 100mm mesh (42cm and 24cm MLS respectively). The use of nets with these mesh sizes greatly reduces the chance of any prey species being caught as bycatch. Current mesh sizes for sprat and herring are 10mm and 50mm respectively although no netting targeting these species is known to occur within the NEIFCA District.

In 2013 NEIFCA commissioned an independent finfish Strategic Environmental Assessment (SEA) which concluded that static netting within its jurisdiction did not pose significant risk to target or non-target retained species or non-retained species. Overall risk was classed as low-negligible and the level of risk to prey availability for features of the Flamborough and Filey Coast pSPA is considered to be low.

Vessel disturbance

Boat disturbance can have an effect on the behaviour of seabirds but the level of disruption to loafing, foraging and other behaviours will be site and species specific. Speckman *et. al.* (2004) found that Marbled Murrelets (*Brachyramphus marmoratus*) were reasonably habituated to marine vessels at sites in south-eastern Alaska where the presence of vessels caused birds to paddle away or dive rather than expend more energy on flying. The authors also noted however that birds holding fish in their bills would swallow the prey when approached by the vessel which led to the suggestion that disturbance events may impact chick provisioning.

Vessel speed is thought to be an important factor affecting response. Faster boats have been shown to cause a greater proportion of birds to flush and at further distances (Bellefleur *et.al.,* 2009). In a study of black guillemots at a breeding colony in the Bay of Fundy (Canada), Ronconi & St. Clair (2002) found that approach distance and vessel speed significantly affected flushing rates of foraging birds. At this site the

[12] http://bna.birds.cornell.edu/bna/species/693/articles/foodhabits Accessed on 21/12/2015
[13] http://www.birdlife.org/datazone/speciesfactsheet.php?id=3302 Accessed on 21/12/2015

authors suggest that a set-back distance of 600m from shore with a speed limit of 25km/h (~13.5kn) would reduce flushing probability to 10% most of the time.

The 2km marine extensions encompassed within the Flamborough and Filey Coast pSPA have been identified to protect important areas for maintenance behaviours including loafing, preening, courtship and washing. Potting vessels in the site tend to operate at speeds of less than 10kn and Officer observations of rafting birds in the site are that they appear relatively unaffected by the presence of vessels. It is thought that birds in the site may have become habituated to the presence of potting vessels given the long-standing usage of the site and the overall risk to features of the pSPA is considered to be low.

6. Conclusion

The level of risk to habitat features of the Flamborough Head SAC and to fish species as prey items for the bird features of the Flamborough and Filey Coast pSPA is considered to be low and no additional management is considered necessary.

Fixed netting effort in the NEIFCA district is considered to be low and anecdotal evidence suggests that fishermen in the vicinity of the EMS do not place their nets near seabird colonies due to the potential for bird by-catch. It is recognised however that no formal regulation to reduce or remove the risk to the bird features within the Flamborough and Filey Coast pSPA exists. In review of the fishery data deficiencies regarding recording of effort and catch/by-catch at an appropriate spatial scale have also been highlighted.

7. Management measures proposed under the revised approach

In order to address the risk to bird features NEIFCA is proposing to revise **Byelaw XVIII: Fixed Engine Byelaw**. The new **Byelaw XVIII Method and Area of Fishing (Netting) Byelaw 2016** includes a temporal closure within the boundary of the pSPA between the 1st of April and the 30th of September.

While overall effort within the NEIFCA District is considered low, in order to address identified data deficiencies and to manage risk in an adaptive manner in the future, NEIFCA is proposing two further byelaws.

Byelaw XXX requires that all commercial fishing vessels and vessels fishing for commercial gain operate and maintain a fully functioning AIS transceiver, transmitting positional information at all times when fishing, transiting, carriaging, steaming or at anchor within the Authority's District.

Byelaw XXXI requires any commercial operators and any person exploiting sea fisheries resources for commercial gain to submit catch returns as appropriate to the Authority on a monthly basis. This is to include any by-catch of birds or marine mammals.

These byelaws will significantly improve the quantification of exploitation, harvest strategies and the spatial distribution of effort at both a regional and site level allowing NEIFCA to monitor and react to changing patterns of effort.

8. In-combination assessment

Consideration has been given to the cumulative impacts on the features from netting and other fisheries related plans or projects including commercial potting, trawling, salmonid fisheries (surface set Environment Agency permitted salmon and sea trout nets) and the NEIFCA Limited Shellfish Permit (LSP) scheme. Consideration has also been given to non-fisheries plans or projects including the ongoing impacts of licenced dredge disposal from Bridlington Harbour, the proposed Bridlington Harbour marina development and bird mortality related to Offshore Wind Farms (OWFs).

Static salmonid netting

The Environment Agency (EA) licence nets for salmon and sea trout of which there are 41 for the Yorkshire region, 10 of which are for T&J nets in district 5 which covers the Flamborough and Filey Coast pSPA. A further 2 licences are unrestricted (drift nets) and are able to fish in any of the districts. T&J nets are surface set, therefore habitat impacts are only anticipated in relation to deployment and retrieval of anchors. Given the low numbers of fishermen using T&J nets in the SAC, the combined habitat impacts are not considered to be significant. Bird by-catch in the EA salmonid fishery has been an issue in the past however mitigation introduced to ensure no AEOI, including coloured headlines and mandatory net attendance has reduced mortality significantly. The mitigation introduced in relation to the EA nets is not considered appropriate for NEIFCA nets due to the restrictions relating to depth and headline clearance laid out in **Byelaw XVIII: Fixed Engine Byelaw** therefore a temporal restriction was considered the most appropriate management measure for NEIFCA nets.

Commercial potting

Static netting is most likely to occur in similar areas to commercial potting. Commercial potting effort is considered to be low-moderate within the site (FHEMS-AA-01) and the combined habitat impacts on features of the Flamborough Head SAC are not considered to be significant. There is potential for vessels transiting between nets or fleets of pots and during retrieval and deployment operations within the site to disturb rafting birds, however vessels are moving at low speeds and impacts are considered to be negligible (FHEMS-AA-01).

Commercial trawling

Trawling is generally incompatible with static gear fishing and there is a natural segregation in the grounds targeted by each method in the region (Figure 5). Trawling in the site is limited to a small area in the north eastern section of the SAC targeted by a small number of vessels (4) on a sunset list as a result of management measures implemented under the revised approach and local fishing practices.

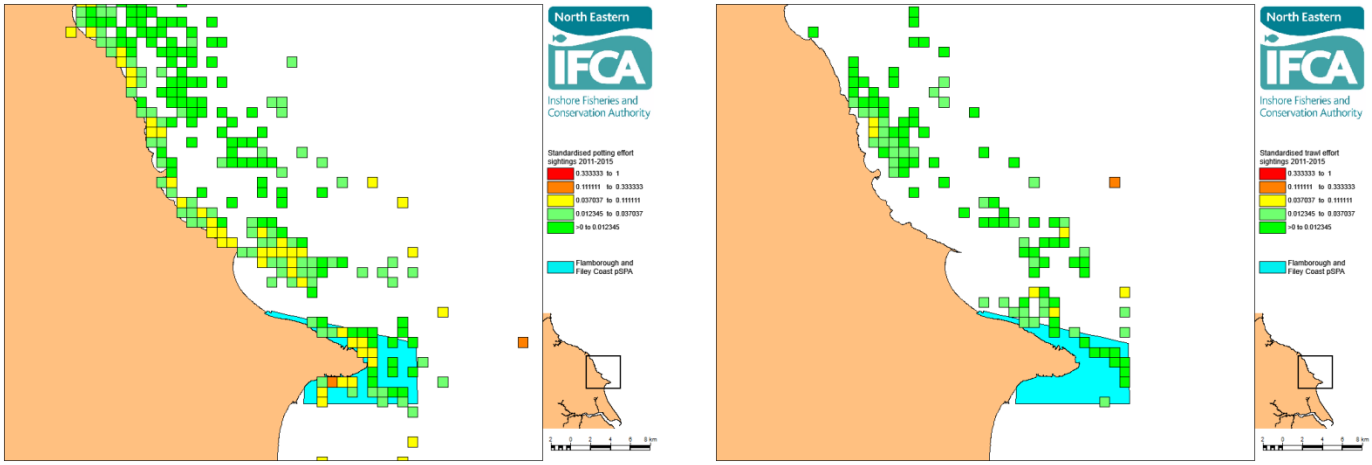

Figure 5. Standardised sightings of potting (left) and trawling (right) in the region of the EMS for the period 2011-2015 highlighting the difference in grounds targeted by static and mobile gears.

Limited Shellfish Permits

Recreational fishers holding a Limited Shellfish Permit (LSP) are permitted to set 100m of net however no known usage of nets to target shellfish occurs within the district. The use of recreational nets is also subject to the restrictions set out in **Byelaw XVIII: Fixed Engine Byelaw.** LSP holders fishing from a vessel use pots to target shellfish and are limited to using 10 pots per vessel per day. In revision of **Byelaw XXII Shellfish Permit Byelaw** the number of pots that can be used by LSP holders is being reduced to 5. LSP potting effort is highly localised within 1-2 miles from boat launches and effort within the EMS is considered to be negligible – none.

Dredge disposal

A dredge disposal site is located within the boundaries of the EMS in an area of soft sediment known as 'Smithic Sands'. In-combination impacts with static gears include changes to levels of turbidity and potential habitat impacts from smothering. The level of disturbance due to static gear use (potting and netting) within the site is considered *de minimis* given background levels and the local hydrographic regime (see Section 5.1). The level of risk to features will be reduced further given the proposed management.

Offshore Wind Farms

The primary reference source used in consideration of in-combination impacts between static netting and OWFs was Thomas *et. al.* (2016) as this is believed to be the most recent information available. This assessment has therefore considered the impacts of the Hornsea Phase 2 OWF (Hornsea 2) as well as those listed in Table 3. The secretary of State is satisfied that the impact of Hornsea 2 alone or in-combination with other plans and projects would not represent an adverse effect upon the integrity of the FFC pSPA or FHBC SPA (Thomas *et. al.*, 2016).

Taking into account the temporal and spatial restrictions in the proposed byelaw (Byelaw XVIII) the in-combination assessment therefore considers the impact on features within the pSPA over the winter and throughout the wider NEIFCA District over all months. While the level of bycatch resulting from netting throughout the District is mostly unquantified, the level of risk to features given current levels of effort is considered to be very low. Furthermore the additional reporting and monitoring mechanisms proposed in

Section 7 will allow NEIFCA to continually assess risk levels and respond to future changes in fishing practices.

Table 3. Agreed list of projects identified for in-combination assessment of physical damage impacts (collision mortality and/or displacement mortality rates) on all listed species for Hornsea 2 OWF. (Thomas *et. al.*, 2016)

Tier	Description of Tier	Agreed list of Projects in Tier
1	Built and operational projects	*Belwind- Phase 1 and Demonstration* *Egmoind aan Zee* Greater Gabbard Gunfleet Sands Kentish Flats Lincs London Array Lynn and Inner Dowsing Sheringham Shoal Teesside Thanet *Thornton Bank*
	Projects under construction	Humber Gateway *Northwind* Beatrice *Belwind- Phase 2* Blyth
2	Consented or submitted applications	Aberdeen European Offshore Wind Deployment Centre *Breeveertien* Dogger Creyke Beck A and B Dudgeon East Anglia One Firth of Forth Phase 1 Seagreen Alpha Seagreen Bravo Galloper Hornsea Project One Inch Cape Kentish Flats Extension Moray Firth Project 1 Neart na Gaoithe *Norther* Race Bank Rentel Triton Knoll Westernmost Rough Dogger Teesside Projects A and B

9. Integrity test

In consideration of the levels of effort in the District, proposed temporal restrictions and improved reporting and data collection mechanisms it is concluded that static netting in the NEIFCA District, either alone or in-combination, will not have an adverse effect on the site integrity of the Flamborough Head European Marine Site.

10. Adaptive Risk Management

For many feature-fishing gear interactions, the relationship between fishing pressure and feature condition is uncertain. This is particularly true for habitats that are subject to high levels of natural disturbance (e.g. sediments in shallow water) and for fishing gears that have a low unit impact but may have a significant effect at very high effort levels. Additionally, knowledge of baseline conditions for some habitats may be poor leading to low certainty over the definition of favourable condition and consequently, the setting of specific conservation objectives.

Data deficiencies highlighted by the revised approach assessment process included the spatial distribution of effort and the resolution of current catch reporting systems. In response to these deficiencies NEIFCA are introducing two byelaws: **Byelaw XXX Automatic Identification System Byelaw 2016** and **Byelaw XXXI Catch Returns Byelaw 2016**.

Byelaw XXX requires that all commercial fishing vessels and vessels fishing for commercial gain operate and maintain a fully functioning AIS transceiver, transmitting positional information at all times when fishing, transiting, carriaging, steaming or at anchor within the Authority's District.

Byelaw XXXI requires any commercial operators and any person exploiting sea fisheries resources for commercial gain to submit catch returns as appropriate to the Authority on a monthly basis. The Authority considers this byelaw will have significant benefits providing accurate information on exploitation, harvest strategies and the spatial distribution of catches within the Authority's jurisdiction.

In certain circumstances, adaptive management has the potential to deliver more appropriate and proportionate evidence-based management for the protected features in the long term, provided the following conditions are met:

- For EMSs, management measures must be consistent with Article 6(2); i.e. must aim to ensure no further deterioration in feature condition. For all MPAs it should facilitate conditions in which a progress towards favourable condition can be expected.
- Longer term management must be genuinely adaptive; i.e. it would be expected to be accompanied by an appropriately designed monitoring programme that would be capable of detecting anthropogenic change, and with management measures regularly reviewed, and if necessary amended, in the light of results from monitoring. Management change is not unidirectional i.e. it is not necessarily more restrictive.
- That relevant stakeholders are involved in the development of management measures.

FHEMS-AA-02

A monitoring and control plan has been developed for MPAs within NEIFCAs jurisdiction and can be accessed here. Both the monitoring and control plan and this assessment document are considered to be live documents that will be reviewed and updated accordingly.

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Annex II: Presentation and interpretation of vessel sightings data

The analysis of NEIFCA sightings data followed the methodology in Vanstaen and Breen (2014) whereby sightings are normalised by taking into account the surveillance effort in an area, removing bias resulting from the surveillance programme. As part of generating the surveillance effort, a 2km buffer was applied around the patrol tracks to take into account that fishing vessel observations can be made at a distance away from the vessel. Relative effort was then calculated based on the following formula:

$$Sightings\ per\ unit\ effort\ (SPUE) = \frac{Number\ of\ sightings}{Surveillance\ effort}$$

The data were analysed using a spatial grid at a resolution of 1km². The SPUE data is heavily skewed towards low levels of activity and a geometric sequence was adopted whereby each class upper limit was three times larger than the upper limit of the previous class. The colour scheme was optimised for visualisation of relative differences within a map and was applied to data for all gear types allowing comparison of relative intensities between gear types.

Data visualization colour scheme and ranges

Class minimum	Class maximum	Colour	Interpreted relative effort intensity
0.333334	1.0		Very high
0.111112	0.333333		High
0.037038	0.111111		Moderate
0.012346	0.037037		Low
0.000001	0.012345		Very low