Fisheries in EMS Habitats Regulations Assessment

European Marine Site: Shell Flat & Lune Deep cSAC (Lune Deep only); Morecambe Bay SAC (Lune Deep part of Morecambe Bay SAC reef feature only) Liverpool Bay SPA

Feature(s): Subtidal Bedrock Reef, Subtidal Boulder and Cobble Reef

Fishing activities assessed: Light Otter Trawl

MMO/IFCA reference
NWIFCA – Lune Deep

1. Introduction

1.1 Need for an Habitats Regulations 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.

The bottom towed fishing gear/reef interest feature interaction of the Lune Deep parts of Shell Flat & Lune Deep SAC and Morecambe Bay SACs has been identified in the Natural England interactions matrix as a red risk. In line with Defra's guidance it is therefore proposed to introduce a byelaw to prohibit the use of bottom towed fishing gear within the Lune Deep part of these SACs and associated buffer zone.

There are currently a limited number of local fishermen prosecuting a light otter trawl fishery in the deep water Lune Deep channel adjacent to the SAC reef interests of these SACs.

The purpose of this HRA is to assess whether it can be concluded that this limited light otter trawl fishery: is not currently having an adverse effect on the integrity of the SAC and; could not have an adverse effect on the integrity of the SAC if the current fishery was protected through insertion of a grandfather rights clause to that effect within the proposed byelaw.

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[2] (Annex 1)
- Natural England's consultation advice (Annex 2)
- Site map(s) – sub-feature/feature location and extent (Annex 3)
- Fishing activity data (map(s), etc) (Annex 4)

2. Information about the European marine site(s)

- Shell Flat & Lune Deep Reg 35(3) Advice (July 2012)
  Features in the Shell Flat section of the SAC have been excluded as this area will be assessed as part of the amber screening process and management measures implemented if required in 2016.
- Morecambe Bay SAC
  Features in the Lune Deep part of Morecambe Bay have been included within the assessment for the Lune Deep part of the Shell Flat & Lune Deep SAC, with which they are contiguous.
- Liverpool Bay SPA
  There is a small overlap between the boundary of the proposed Byelaw 6 Lune Deep closed area and the boundary of Liverpool Bay SPA.

2.1 Overview and qualifying features

- 1170 reefs
  - *Bedrock reef communities*
    The majority of the Lune Deep supports mixed faunal and turf communities (CR.HCR.XFa) that provide habitat for fauna associated with hard substrates such as those found in a 1992 diver study: tide-swept fauna including hydroids, bryozoans, anemones and sponges (Emblow 1992).
  - *Stony reef communities*
    Stable boulder and cobbles also support communities associated with hard substrates. In the Lune Deep these cobbles (> 64 mm in diameter) support the bryozoans *Flustra foliacea* and *Alcyonidium diaphanum* and the hydroids *Nemertesia antennina* and *Hydrallmania falcata*.

2.2 Conservation objectives

- Reefs

[1] See Fisheries in EMS matrix:
http://www.marinemanagement.org.uk/protecting/conservation/documents/ems_fisheries/populated_matrix3.xls
[2] Reference list will include literature cited in the assessment (peer, grey and site specific evidence e.g. research, data on natural disturbance/energy levels etc)

Subject to natural change, maintain the reefs in favourable condition.

Favourable condition of the reefs will be determined through assessment that the following are maintained in the long term in the site:
1. Extent of the habitat
2. Diversity of the habitat and its component species
3. Community structure of the habitat (e.g. population structure of individual notable species and their contribution to the functioning of the ecosystem)
4. Natural environmental quality (e.g. water quality, suspended sediment levels, etc).
5. Natural environmental processes (e.g. biological and physical processes that occur naturally in the environment, such as water circulation and sediment deposition should not deviate from baseline at designation).

3. Interest feature(s) of the EMS categorised as 'Red' risk and overview of management measure(s) (if applicable)

Reefs:
NWIFCA proposed Byelaw 6 (Protection of European Marine Site Features) includes a Lune Deep closed area, encompassing the Lune Deep SAC reef interest feature and a proportional buffer, within which all bottom towed gears would be prohibited.
This HRA is being undertaken on the proposal to include a grandfather rights clause in the above proposed Byelaw 6 (for the Lune Deep closed area) which would allow the current limited, light otter trawl fishery to continue.

4. Information about the fishing activities within the site

The only bottom towed fishing gear activity currently practiced in the vicinity of the Lune Deep reef interest feature is light otter trawling for flat fish.

In recent years this activity has only been undertaken by a very limited number of Fleetwood based vessels, crewed by experienced local fishermen.

The activity being assessed is that these vessels would be granted permission to enter the closed area while fishing via a grandfather rights clause in NWIFCA Byelaw 6. Vessels will have to provide satisfactory evidence of having entered the closed area while fishing on at least 5 days in the last 36 months (from the making of the Byelaw on 6th December 2013) in order to be granted an authorisation to enter the closed area while fishing. Currently the NWIFCA is aware of one vessel that will be able to provide such evidence and have had correspondence from a further three vessels. It is currently unknown whether these additional vessels will be able to produce satisfactory evidence to be granted an authorisation.

The fishing activity detailed below is that of the first vessel as an example of how the fishing is carried out in this area. Discussion with other fishermen has revealed that all vessels operate in a similar manner with similar gear and are of a similar size with the specific information referring to the largest vessel.
This vessel has a registered length of 12.17 m and an engine size of 112 kW. Fishing gear consists of small otter trawl doors (wood or steel), a combination wire bridle and net which is lightly weighted by a ground rope with rubber disks and small chain (see photos in Annex 4). When towing the maximum width of gear, door to door is 30 m. Towing speed, including the movement with the tide, is approx. 2.4 knots or slower.

Fishing occurs on the areas of sandy sediment forming the bottom of the Lune Deep channel and adjacent to the base of the steeply sloping bedrock and boulder SE-facing reef interest features. NWIFCA officers have scrutinised historical tracking data from the vessels which shows the position of the vessel while trawling in the deep sandy hole. The vessel position is over the reef or within the buffer when the towed gear is inside the deep sandy hole of the Lune Deep channel (see map in Annex 4). The necessity of this positioning is due to the tidal currents and winds dominant in this area. Fishing occurs on ebb tides when the tide is moving to the South West. When the gear is in the sandy hole, the vessel is moved to the North West (over the reef). When the gear approaches the northern extent of the sandy ground the vessel is manoeuvred south in order to avoid contact with the hard ground. Due to these strong tidal currents, safety reasons dictate that this area can only be fished at times of neap (below approx. 8.4 m high water), slack tides. Strong tidal currents mean that fishing in this area is potentially hazardous to vessel and crew (due to the reef) and therefore can only be carried out by experienced Skippers who know the specific technique required to fish safely inside the hole (i.e. avoid contact with the reef). If gear were to come into contact with the reef it is highly likely that gear will be damaged and there is a danger of becoming stuck fast, resulting in loss of gear or worse, loss of vessel and lives. The Skipper also avoids areas with large cobbles and boulders (stony reef) as these can also stop fishing and damage gear.

Weather conditions, and in particular wind, also determine the position of the vessel in relation to the gear and limit fishing activity to times of favourable conditions.

As well as being limited by tides and weather, fishing activity only occurs when target species (usually sole and other flatfish) are present in the area. This is limited by the seasons (Summer) and also by other factors. If after one trawl through the area, or more generally in the wider sandy channel, catches are not good, fishing will not continue. If fish are present a maximum of 5 passes can be made through the deep hole in a day, each with a very short duration (approx. 10 minutes). Usually fishing only occurs in the sandy hole on a few days in a year. However, these days can yield a substantial and valuable catch.

5. Test for Likely Significant Effect (LSE)

The Habitats Regulations Assessment (HRA) is a step-wise process and is subject to a coarse test of whether a plan or project will cause a likely significant effect on a European Marine Site[3].

5.1 Table 1: Assessment of LSE

Liverpool Bay SPA
The potential for the authorisation by the NWIFCA of vessels to fish within this closed area at the current low level of activity to impact upon the interest features of Liverpool Bay SPA (red-throated diver and common scoter) is considered to be low:

- The proposed area where fishing is would be authorised by a grandfather rights clause overlaps a very small area and % of the SPA.
- The sediments in this area are in deeper water that are unlikely to be preferred or available feeding habitat for common scoter.
- The area is close to a busy navigation channel. Red-throated diver and common scoter are highly sensitive to disturbance from vessels. The area is likely to support lower densities and be of lower value to these species.

[3] Managing Natura 2000 sites: http://ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm

- The overwintering period for red-throated diver is August to May. The sole fishery is targeted in Summer, outwith the overwintering period.

(Based upon information from density maps for the two features which were produced by JNCC during the site selection process along with the understanding of the behaviour of the two species in relation to foraging technique and behaviour to long term disturbance (Shipping lane avoidance.)

Therefore ***No Likely Significant Effect*** is concluded.

Lune Deep cSAC (and contiguous Morecambe Bay SAC reef feature)

1. Is the activity/activities directly connected with or necessary to the management of the site for nature conservation?	**No**
2. What potential pressures such as abrasion/physical loss by gear type(s) are likely to affect the interest features? *(reference to conservation objectives)*	Surface abrasion of bedrock and boulders and movement of stones via contact of light gear with these features. The Matrix and NE review of fisheries and EMS features has categorised this interaction as "Red Risk". The Reg 35 Advice package states that the reef feature has: "moderate sensitivity to abrasion which can cause damage to a significant proportion of the species found in relatively stable cobble, boulder and bedrock reef communities."
3. Are the qualifying features potentially exposed to the pressure(s)?	The light otter trawl fishery targets fish on the sandy base of the Lune Deep channel. It does not target bedrock reef or cobble and boulder (stony reef) features, rather actively seeks to avoid these areas due to risks to gear and vessel. However, when working in the sandy hole next to the reef feature, it is possible that fishing gear could make accidental and limited contact with bedrock or boulders and cobbles at the edge of the bedrock reef features.
4. Potential scale of pressures and mechanism of effect/ impact (if known)	This HRA assesses the current, limited vessel (maximum 4) fishery within the proposed Byelaw 6 Lune Deep closed area. The proposed grandfather rights clause would restrict the activity to this limited number of fishermen that can show a proven, recent track record of fishing in the area. Contact between fishing gear and bedrock reef and boulder and cobble (stony reef) is actively avoided on gear and safety grounds but possible accidentally. Abrasion of gear on the substrate and movement of smaller stones would lead to damage to or loss of epifauna.

5. Is the potential scale or magnitude of any effect likely to be significant?[4]	**Alone** **Uncertain** Comments : The risk of fishing gear coming into contact with bedrock reef is extremely low. However, there is a slightly greater risk that fishing gear will contact the boulder and cobble ground at the bottom of the reef feature. Therefore, because there is a possible impact on the reef feature, an Appropriate Assessment will be carried out.	**In-combination** **N/A** Comments : No other activities of this nature occur on or within the buffer zone for the reef features of Lune Deep.
6. Have NE been consulted on LSE? If yes, what was NE's advice?	Yes. NE advised Likely Significant Effect due to the possibility of occasional, accidental contact between fishing gear bedrock reef and boulders and cobbles (stony reef) at the base of the steeply sloping Lune Deep SAC reef interest feature.	

[4] Yes or uncertain: completion of AA required. If no: LSE required only.

6. Appropriate Assessment

6.1 Potential risks to features

Light Otter Trawls, A Limited Number of Vessels

(details of gear and activity described in section 4)

Stony Reef Communities

(Matrix sub-feature: Subtidal boulder and cobble reef)

Potential Pressure

Otter boards, bridles and ground rope may make accidental contact with the boulders and cobbles (stony reef) during a trawl in the sandy bottom of the Lune Deep, particularly in the area next to the deepest sandy hole.

Impacts

The Regulation 35 advice package for the Shell Flat & Lune Deep SAC (2012) states generally that the reef feature has a moderate sensitivity to physical loss or damage. This is a precautionary assessment relating to the most vulnerable habitat type found on this feature. However, the vulnerability to this impact has been stated in the advice as low due to the feature's low exposure to activities that could result in such an impact.

The Matrix and corresponding evidence review of fisheries and European Marine Site features undertaken by Natural England and reviewed by CEFAS have superseded this assessment with the categorisation of the interaction of towed (demersal) trawls and reef features (including bedrock and boulder and cobble reef) as a "Red risk".

The supporting document for this red risk gear/feature interaction states that the confidence for this categorisation is *medium:* "The conclusions are supported by directly relevant scientific information from a number of different sources. However, this is partly from grey literature based on expert inference and peer reviewed empirical evidence of the impacts of fishing gear to similar habitats in other parts of the world."

This Appropriate Assessment uses this generic assessment and applies the evidence directly to the specific fishery and features of the Lune Deep SAC.

The evidence review and an additional literature search found that there have been no studies that look directly at the impact of light otter trawl gear on boulder and cobble reef communities in the UK. This limited volume of research is partly due to the fact that, in the most part, trawl fisheries target soft ground. References detailing the impacts of otter trawls on soft ground were examined but were found not to provide evidence applicable to this assessment. Instead the magnitude of impacts must be inferred from the few studies that have taken place on hard ground with much heavier gear and/or in more sensitive habitats in other regions.

Contact between fishing gear and large boulders would result in abrasion to the substrate. The otter boards from a trawl from a large vessel (>24 m) on soft sediment will penetrate approximately 8.4 cm, with an average of 1.01 cm across the entire width of the gear (Grieve et al 2011). A tow from smaller vessel will have a lesser impact. This harder substrate is very unlikely to be damaged or removed via contact with fishing gear. Instead fishing gear will scrape across the hard surface. Smaller cobbles could be moved by the gear. This disturbance may result in the reduction of the

stability of the cobble reef feature and also loss of habitat complexity (Engel & Kvitek 1998, Freese et al 1999).

The most significant impact from fishing gear on rock substrate will be damage and loss of epifauna. Surveys show the epifauna associated with this boulder and cobble (stony) reef to be the bryozoans *Flustra foliacea* and *Alcyonidium diaphanum* and the hydroids *Nemertesia antennina* and *Hydrallmania falcata* (Reg 35 advice). A 2011 CMACS drop down video survey photographed these communities at either end of the deep sandy hole next to the reef feature. (Annex 3).

A study in the Gulf of Alaska using much heavier gear (with rock hoppers and a ground rope strung with 60 cm tyres) found that although larger sponges were damaged by the gear, it was the movement of rocks that had an impact on smaller organisms. Motile invertebrates such as starfish were not damaged by the gear (Freese et al 1999). In Australia a study found that immediately after one pass of an otter trawl there was a 15.5% decrease in density of organisms that stood 20 cm or taller from the substrate. This increased to 50% after 4 repeated passes (Moran & Stephenson 2000). Trawls on soft substrate also lead to a reduction in abundance of species such as anemones and gastropods (McConnaughey et al 2000).It is therefore not unreasonable to infer that lighter gear such as that used in the Lune Deep on a less sensitive epifaunal community will have a much smaller impact than those found in these studies.

Although previous studies on deep water habitats show that recovery of large organisms such as sponges and corals can be slow (Freese 2001), information on recovery of the communities found on the Lune Deep reef (more exposed and in shallower water) after this type of fishing is also very limited. This is a tide swept community and the species that occur within it are robust. After damage the bryozoan *Flustra foliacea* can repair damage to fronds within 5 – 10 days and is likely to survive and grow back if a holdfast remains intact. This species has been classed as having high recoverability after physical abrasion (Tyler-Walters and Ballerstedt 2007). Studies of similar habitat in Cardigan Bay, Wales have shown that hydroid turf and hydroid species such as *Nemertesia antennina* are high in abundance after stormy periods, indicating that these species recover well after temporary disturbance (Albrecht 2013). The species listed above breed at least perennially if not more often and larvae settle where there is exposed hard substrate. The area of reef that may be vulnerable to contact and damage from fishing gear is small in comparison to the whole reef area, so there will be remaining stock available for repopulation of damaged areas and therefore recoverability can be considered to be high.

The conservation objective for this feature is “maintain”. Initial data for this feature was collected in 2008 and the change in fishing activity since, if any, has been a decrease. The NWIFCA and Natural England are not aware of any site specific evidence that the limited otter trawl fishery is having an impact upon the condition of the site.

Exposure

While fishing the Skipper takes care to avoid areas that have any stony ground. Cobbles and boulders can damage gear and their presence in the net will require fishing to be aborted and the nets hauled in order to remove the obstruction.

This is generally a common practice in otter trawling. Even with much heavier gear, larger vessels and in deeper water trawlers avoid hard ground due to damage to nets (Hall-Spencer et al 2002).

However, there is some likelihood that boulder and cobble (stony) reef communities will be exposed to this pressure as they lie in the interface between the bedrock reef feature and the sandy ground that can be fished.

Fishing tracks from the representative fisherman, Mr. Mitchinson, and discussion with others show that for 30% of the length of the base of the reef feature in the Lune Deep channel, the surface position of a vessel fishing the sandy channel may be over the buffer or reef feature itself. This area is also that with the steepest reef wall (see Annex 3), suggesting that the more sloping cobble and boulder reef edge is less likely to be present at this point.

In a worst case scenario if gear is felt to make contact with hard ground, the vessel is halted and the gear hauled immediately, rising off the seabed in a matter of minutes. Moving with the tide at a speed of approx. 1 knot over a depth of 65m, a maximum of 185 m will be travelled by the vessel before the gear is fully on-board. The maximum width of the gear is 30 m (with the width of a trawl door less than 4 m). If the gear were to remain in contact with the seabed for this distance (which it clearly would not) an absolute maximum area of 5400 m^2 would be impacted. This is 0.17% of the total reef area. On soft substrate only 12% of the seabed in an otter trawl track is physically changed (Grieve et al 2011). This is because the relatively light weight of the ground rope and bridle mean that it is unlikely that the entire width of the gear will make contact at any one time.

This area is not fished regularly or intensively. Tidal state and wind and other weather conditions in addition to the seasonality of target species all limit time and number of days when fishing is possible. The proposed inclusion of a grandfather rights clause within the proposed Byelaw 6 closed area is intended to enable the NWIFCA to authorise a continuation of this low level of fishing activity in this area subject to the NWIFCA being able to conclude no adverse effect on the integrity of the SAC.

Bedrock Reef Communities

(Matrix sub-feature: Subtidal bedrock reef)

Potential Pressure

It is possible for otter boards, bridles and ground rope to make contact with the bedrock reef feature whilst being deployed for fishing in the sandy bottom of the Lune Deep next to the reef feature.

Impacts

Contact of the fishing gear with the bedrock reef feature would result in abrasion to the substrate and damage to or loss of the epifaunal community. The hard bedrock substrate would not be substantially damaged or removed by contact. Impacts would be similar as those detailed above for stony reef communities.

Exposure

The size and power of the vessel and weight of gear is not sufficient for gear to be deliberately towed directly across the bedrock reef feature. Contact with this very hard ground would result in damage to the gear and it is likely that the vessel would become stuck fast, resulting in the complete loss of gear, the vessel and putting crew at great risk. The Skippers are highly experienced and use charts, electronic plotters, echo sounders and their knowledge of the behaviour of tides, weather and the gear to ensure that this type of contact is avoided at all costs. The safety implications of this type of contact mean that a precautionary distance is kept from the bedrock reef. Any contact made would be accidental. The limited number of days fishing in the area brings down the very small risk even further. Therefore exposure is negligible.

Table 2: Summary of Impacts

Feature /Sub feature(s)	Conservation Objective	Potential pressure[5] (such as abrasion/physical loss by gear type(s)[6] *(reference to conservation objectives)*	Potential ecological impacts of pressure exerted by the activity/activities on the feature[7]	Potential exposure[8] to pressure and mechanism of effect/impact if known	Mitigation[9]
Stony reef communities	Maintain	Contact and abrasion by otter boards, bridles and ground rope.	Damage or loss of epifauna via scraping or movement of stones. Recoverability of epifauna is high.	Currently only prosecuted by a very limited number of local experienced skippers/vessels a few days in a year during a few months of the year. Skippers avoid areas with significant boulders and cobbles due to impact on ability to fish successfully and damage to gear. Feature vulnerable to accidental contact limited to boulders and cobbles at the base of 30% of deep edge of the reef feature.	Proposed grandfather rights clause in Byelaw 6 Lune Deep closed area is intended to enable NWIFCA to authorise only fishermen / vessels with a recent track record of fishing in this area, to fish within this area using the same methods. The practical implications of this are that fishing is likely to be restricted to a very small number of vessels.
Bedrock reef	Maintain	Contact and abrasion by	Damage or loss of	Exposure to damage by gear	Proposed grandfather

[5] Guidance and advice from NE.
[6] Group gear types where applicable and assess individually if more in depth assessment required.
[7] Should document the sensitivity of the feature to that pressure (where available) and a site specific description.
[8] Evidence based e.g. activity evidence and quantified if possible. Including current management measures that reduce/remove the features exposure to the activity.
[9] Detail how this reduces/removes the potential impact(s) on the feature e.g. spatial/temporal/effort restrictions that would be introduced.

communities		otter boards, bridles and ground rope.	epifauna via scraping. Recoverability of epifauna is high.	contact is negligible. Skippers actively avoid contact with the bedrock reef and leave a safety margin when fishing. Any contact would be accidental and potentially dangerous to crew and vessel. The potential exposure of pressure is negated further by the limited number of vessels and the temporally and spatially limited nature of the fishing activity.	rights clause in Byelaw 6 Lune Deep closed area is intended to enable NWIFCA to authorise only fishermen / vessels with a recent track record of fishing in this area, to fish within this area using the same methods. The practical implications of this are that fishing is likely to be restricted to a very small number of vessels.

7. Conclusion[10]

Taking into account the information detailed in the Appropriate Assessment it can be concluded that the current low level of fishing, using bottom towed gear within the proposed Byelaw 6 Lune Deep closed area, is not having an adverse effect on the integrity of the Shell Flat & Lune Deep SAC or Morecambe Bay SAC reef interest features and sites. It can also be concluded that the authorisation by the NWIFCA of the continuation of the current low level of fishing, using the same methods and at the same frequency, under the proposed grandfather rights clause within Byelaw 6, would not have an adverse effect on the integrity of the Shell Flat & Lune Deep SAC or Morecambe Bay SAC reef interest features.

At this time it is not possible to confirm the number of vessels that will be granted a grandfather rights authorisation to fish in the area. However, the NWIFCA has thoroughly investigated the current fishing activity in the area and, to its knowledge, the restrictions in the clause will limit the fishery to a maximum of four vessels carrying out the level of activity assessed above.

If the number of vessels eligible to fish under the grandfather rights clause, or the level of fishing activity, increase beyond that which has been assessed, then the NWIFCA would review the HRA of the grandfather rights clause.

8. In-combination assessment

No other plans or projects or activities of a similar nature occur in this area. Therefore, an in-combination conclusion of no adverse effect can be made.

9. Consultation with Natural England

See attached advice from Natural England for Byelaw 6.

10. Integrity test

The NWIFCA's proposed Byelaw 6 Lune Deep closed area will prohibit the use of bottom towed fishing gear within the closed area.

The NWIFCA's proposed Byelaw 6 Lune Deep closed area includes a proposed grandfather rights clause which has the aim of allowing the existing low level of fishing activity immediately adjacent to the Lune Deep reef interest to continue, subject to the NWIFCA being able to confirm that this will not result in an adverse effect on the integrity of Shell Flat & Lune Deep SAC and Morecambe Bay SAC.

This HRA has assessed the potential of authorisation by the NWIFCA under the grandfather rights clause of the continuation of the current low level of fishing activity, to result in an adverse effect on the integrity of Shell Flat & Lune Deep SAC and Morecambe Bay SAC.

The risk of the light otter trawl used in the current fishery prosecuted by local, very experienced fishermen/vessels making contact with the bedrock reef feature is negligible and with boulder and cobble reef the risk is very low. The fishery is targeting sole and other demersal fish on the sandy seabed of the Lune Deep channel, adjacent to the Lune Deep reef feature, and any contact with the reef interest feature is accidental and a serious hazard to the vessel and fishermen. The risk to the reef feature interests is reduced further by the low frequency and seasonality of the fishing that occurs in the area.

[10] If conclusion of adverse affect alone an in-combination assessment is not required.

If contact is made by the light gear damage will be limited to a very small area (<<0.17%) of the whole feature and the severity of such damage will be low. Recovery of the epifaunal community after such damage is likely to be rapid due to the resilient nature of the species in that community.

Proposed grandfather rights clause in Byelaw 6 Lune Deep closed area is intended to enable NWIFCA to authorise only fishermen/vessels with a recent track record of fishing in this area, to fish within this area using the same methods. The practical implications of this are that fishing is likely to be restricted to a very small number of vessels.

It is concluded that this fishing activity, with the proposed restrictions and mitigation measures set out in the grandfather rights clause contained within the NWIFCA's proposed Byelaw 6 Lune Deep closed area, will not have an adverse effect on the integrity of Shell Flat & Lune Deep SAC and Morecambe Bay SAC.

Annex 1: Reference list

Albrecht, J. K. (2013). Taxonomic and functional recovery of epifauna after the permanent closure of an area of the Cardigan Bay Special Area of Conservation (SAC), Wales, to a scallop dredge fishery. MSc thesis, Bangor University, Fisheries & Conservation report No. 28, Pp.81

Bridger, J.P. Foster, J.J., Margetts, A.R. and Strange, E.S. (1981) *Glossary of United Kingdom Fishing Gear Terms*. Fishing News Books.

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Hall-Spencer, J., Allain, V. and Fossa, J.H. 2002. Trawling damage to Northeast Atlantic ancient coral reefs. Proceedings of the Royal Society, London B, 269: 507–511

McConnaughey,A., K. L. Mier, and C. B. Dew McConnaughey, R. A., Mier, K. L., and Dew, C. B. 2000. An examination of chronic trawling effects on soft-bottom benthos of the eastern Bering Sea. – ICES Journal of Marine Science, 57: 1377–1388

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Moran, M.J. & Stephenson, P.C., 2000. Effects of otter trawling on macrobenthos of demersal scalefish fisheries on the continental shelf of northwestern Australia. *ICES Journal of Marine Science,* **57**, 510-516.

The Matrix supporting document: Subtidal bedrock reef including chalk and subtidal cobble and boulder reef. (http://www.marinemanagement.org.uk/protecting/conservation/documents/ems_fisheries/subtidalbedrock.pdf)

Other References, not directly cited:

T. Blasdale, M. Duffy, R, Enever, R. Fisher, F. A. Lannin, F. Marubini, H. Stevens and M. Tasker. 2011. Advice from the Joint Nature Conservation Committee and Natural England with regard to fisheries impacts on Marine Conservation Zone habitat features.

Correspondence and meeting with Gary Mitichinson, skipper of the vessel Albion (Fleetwood) (October 2013)

Correspondence and meeting with local IFCOs, in particular S Brown. (October 2013)

Annex 2: Natural England's consultation advice

Date: 18 February 2014
Our ref: 112882
Your ref: Byelaw 6 Consultation Protection of EMS features

Natural England
Juniper House,
Murley Moss
Kendal, LA9 7RL
0300 060 0493

BY EMAIL ONLY

Dear Dr Stephen Atkins

Re: NWIFCA – Byelaw 6 Protection of European Marine Site Features

Natural England is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

Please accept this letter as Natural England's formal advice as to whether the proposal for the above byelaw for the NW Inshore Fisheries & Conservation Authority's (NWIFCA) District, meets the requirements under Article 6(2) of the EU Habitats Directive to avoid damage or deterioration to the Solway Firth, Morecambe Bay, Shell Flat & Lune Deep and Dee Estuary European marine sites (EMS).

The byelaw is proposed to protect the following features from impacts which could be caused by the activities listed:

- Honeycomb worm *(Sabellaria alveolata)* reef; Boulder and cobble reef; Bedrock reef; Seagrass beds; from bottom towed fishing gear
- Seagrass beds; from bait collection and handworked fisheries

Natural England advises that by implementing this byelaw the NWIFCA will have taken appropriate steps to protect the designated features listed above of the Solway Firth, Morecambe Bay, Shell Flat & Lune Deep and Dee Estuary EMS from deterioration or disturbance arising from the activities to be managed.

We are content that the best available, and most up to date evidence on feature location and extent has been used to define the closed areas at the present time. We believe that appropriate buffers have been applied to ensure the protection of the features above, from both direct and indirect impacts of the managed activities.

Please do not hesitate to contact me if you have any questions or require further information.

Yours sincerely,

Helen Ake
Lead Marine Advisor
Irish Sea Marine Team
Natural England
Juniper House, Murley Moss
Kendal, LA9 7RL
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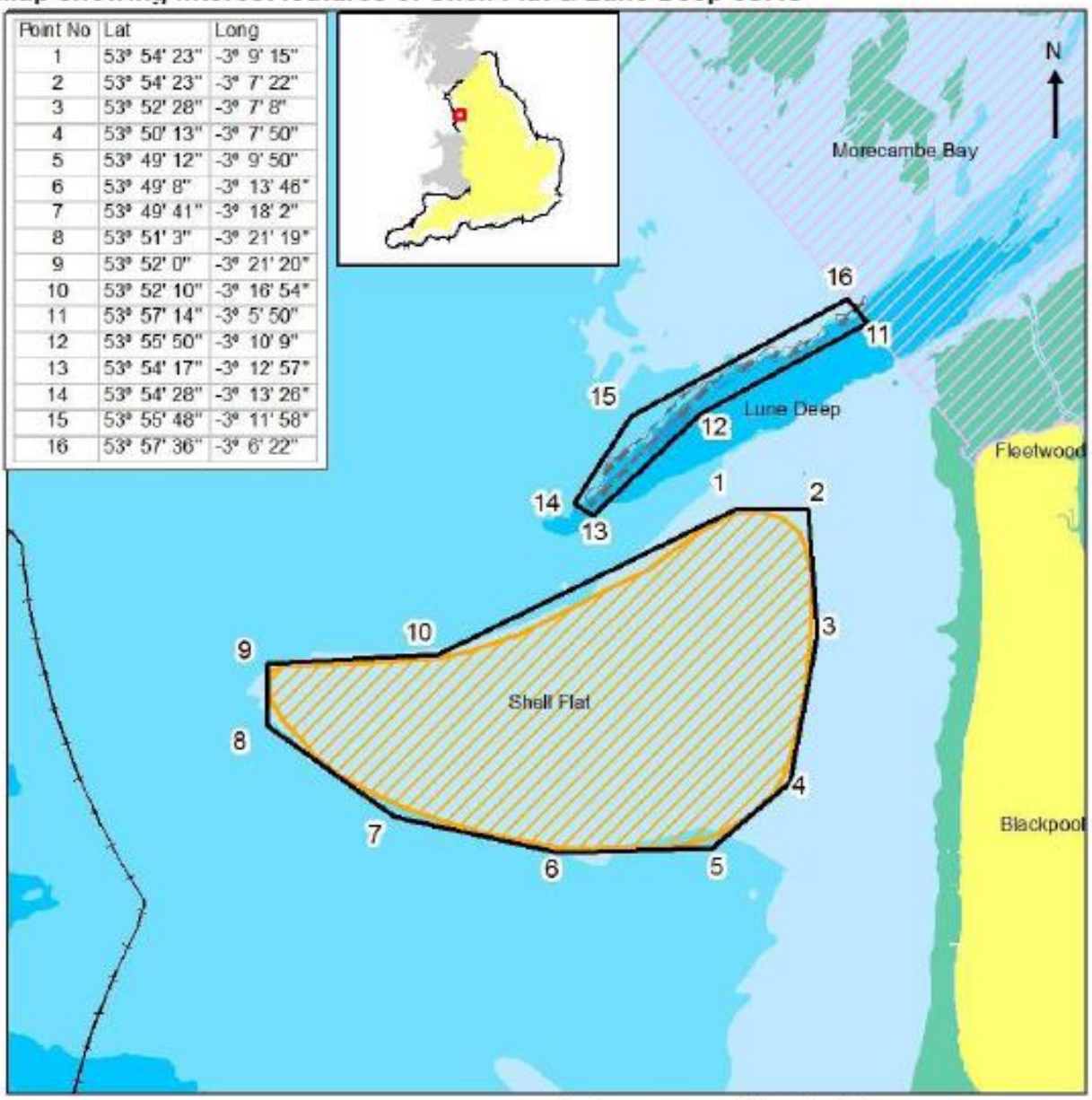
Annex 3: Site Map

Map showing interest features of Shell Flat & Lune Deep cSAC

Point No	Lat	Long
1	53° 54' 23"	-3° 9' 15"
2	53° 54' 23"	-3° 7' 22"
3	53° 52' 28"	-3° 7' 8"
4	53° 50' 13"	-3° 7' 50"
5	53° 49' 12"	-3° 9' 50"
6	53° 49' 8"	-3° 13' 46"
7	53° 49' 41"	-3° 18' 2"
8	53° 51' 3"	-3° 21' 19"
9	53° 52' 0"	-3° 21' 20"
10	53° 52' 10"	-3° 16' 54"
11	53° 57' 14"	-3° 5' 50"
12	53° 55' 50"	-3° 10' 9"
13	53° 54' 17"	-3° 12' 57"
14	53° 54' 28"	-3° 13' 26"
15	53° 55' 48"	-3° 11' 58"
16	53° 57' 36"	-3° 6' 22"



candidate Special Area of Conservation

Shell Flat and Lune Deep

Scale 1:200,000 Map 1 of 1

0 1 2 4 Kilometers

EU Site Code: UK0030376
Version number: 2.0
Longitude: 3° 12' 45" W
Latitude: 53° 51' 50"N
Projection: UTM 30N (WGS84)
Area of SAC: 105.65 sq km 10565.34 ha

Theme ID: 1452095
Grid Ref: SD203415
Version: 9.0
Plotted: 05/09/2011
Plot ID: 9.0

- candidate Special Area of Conservation
- Reefs
- Sandbanks which are slightly covered by sea water all the time
- Special Areas of Conservation

Depth Areas

- Drying
- <=10m
- <=20m
- <=50m
- <=100m
- England 12nM Territorial Seas Limit

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Figure 1. Map of Lune Deep & Shell Flat SAC (map supplied by Natural England)

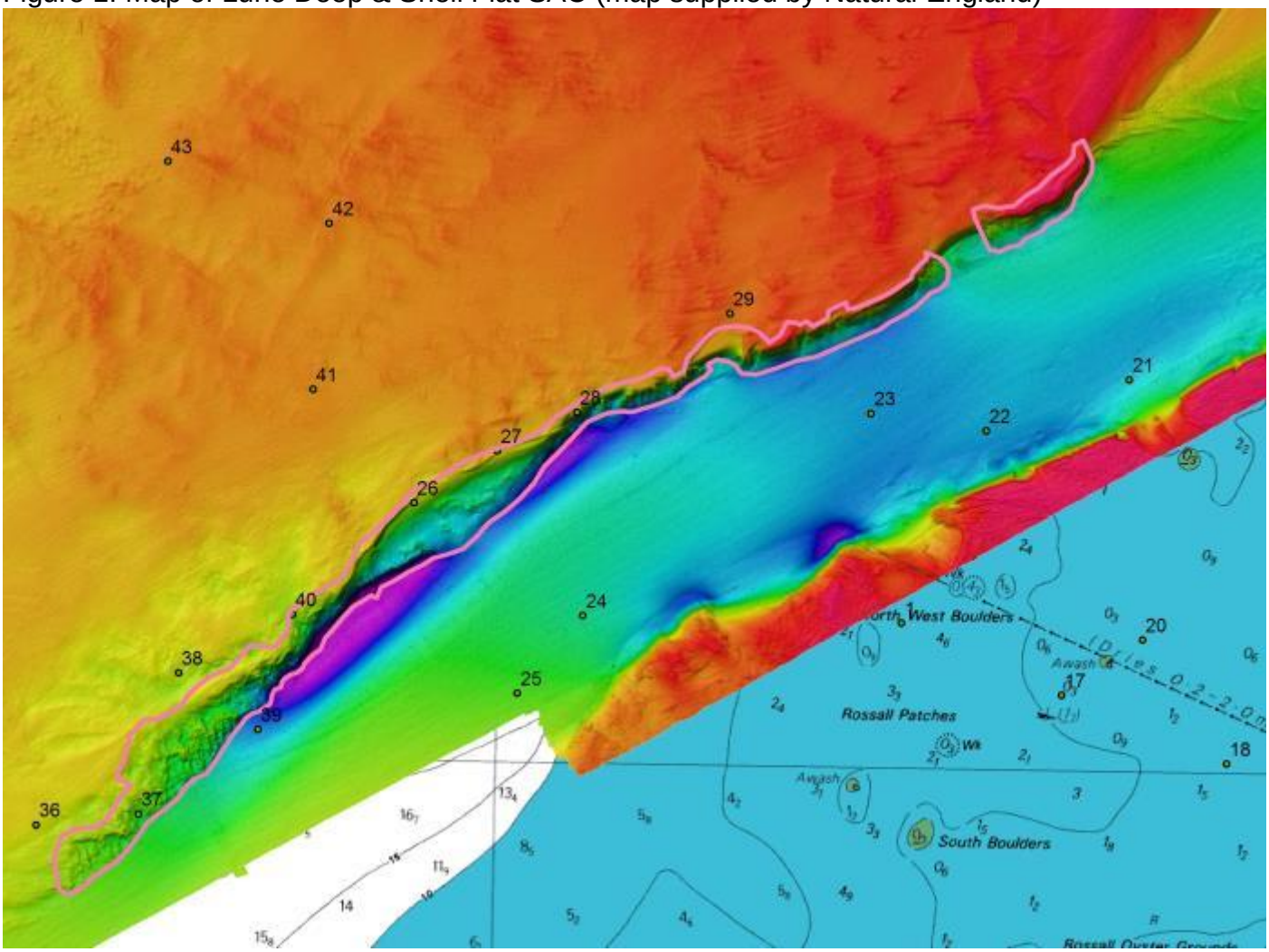

Figure 2. Lune Deep SAC reef feature extent (pink) and bathymetry data (map supplied by Natural England)

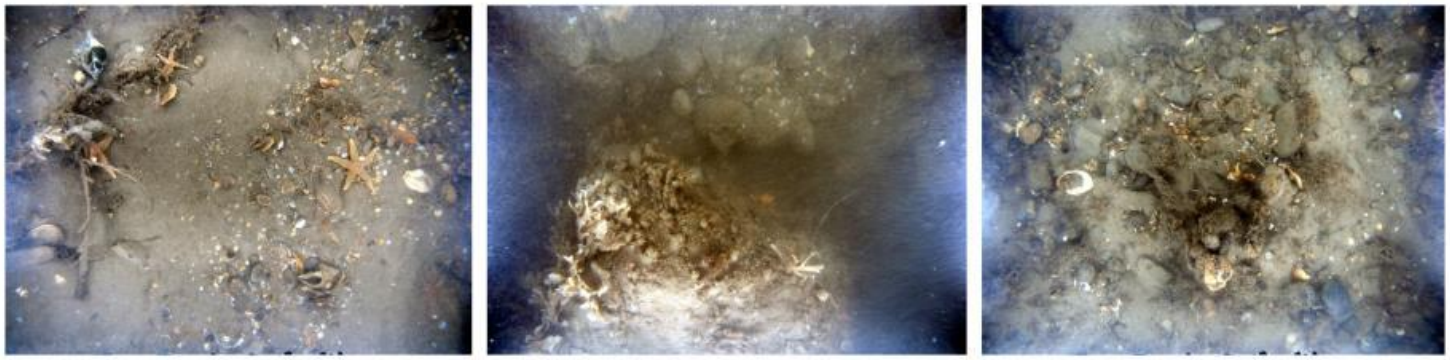

Figure 3. Representative photographs of the stony habitat found on the southern edge of the Lune Deep reef feature. (CMACS, 2011 – supplied by Natural England)

Annex 4: Fishing activity maps

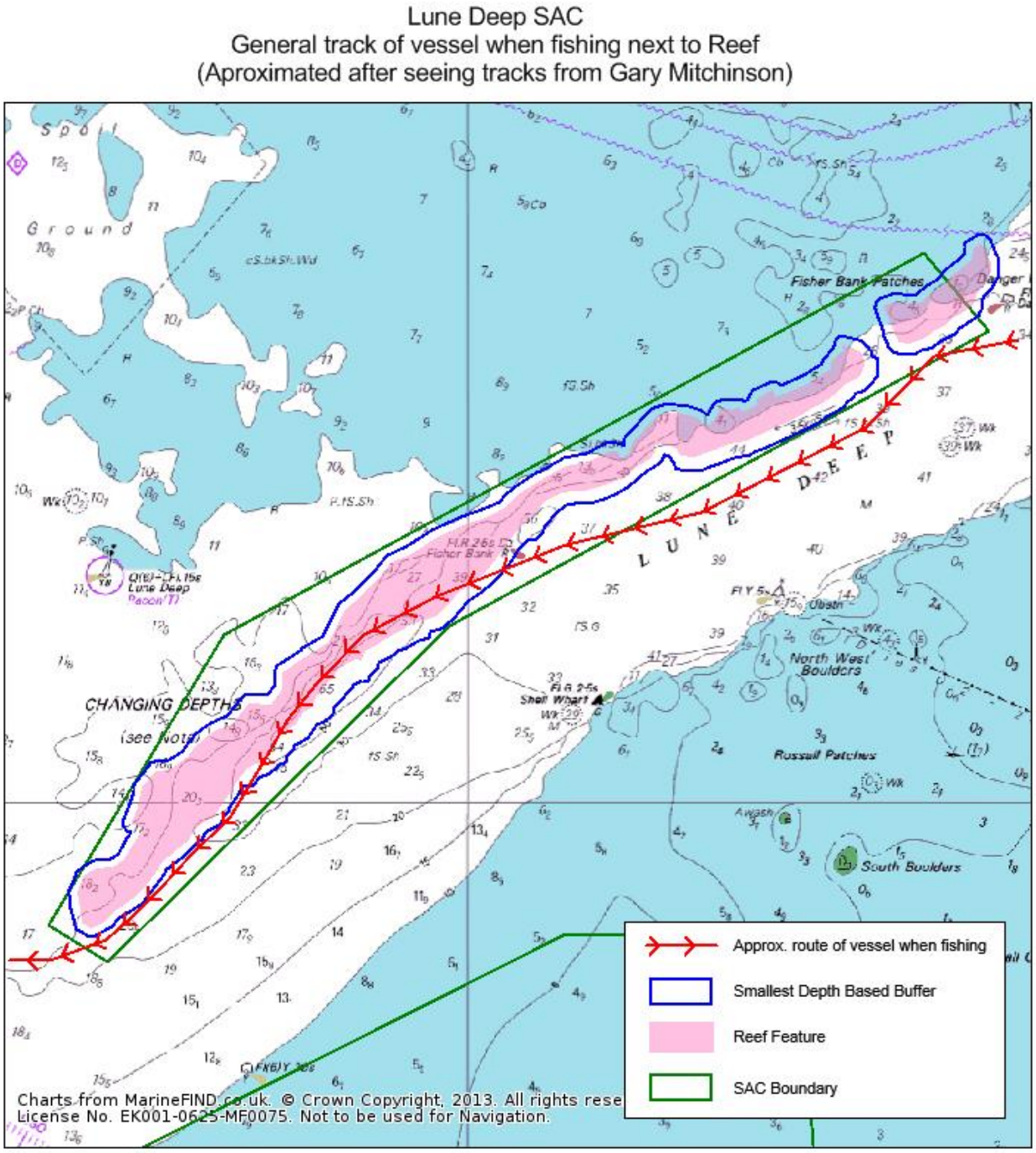

Figure 4. An approximation of the track taken by fishing vessels when fishing on the sandy ground close to the south of Lune Deep reef (NWIFCA. 2013)

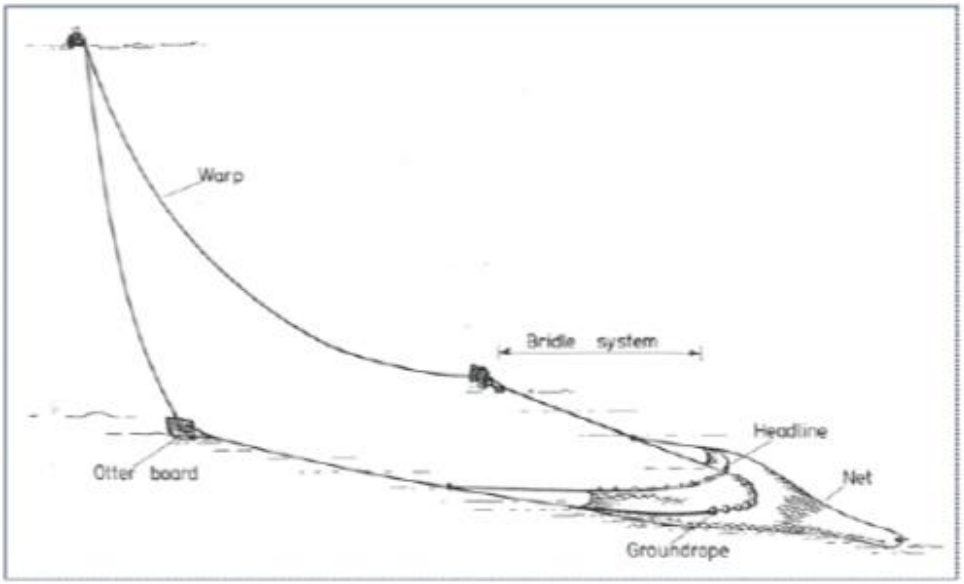

Figure 5. The basic components of an otter trawl (Bridger et al 1981)

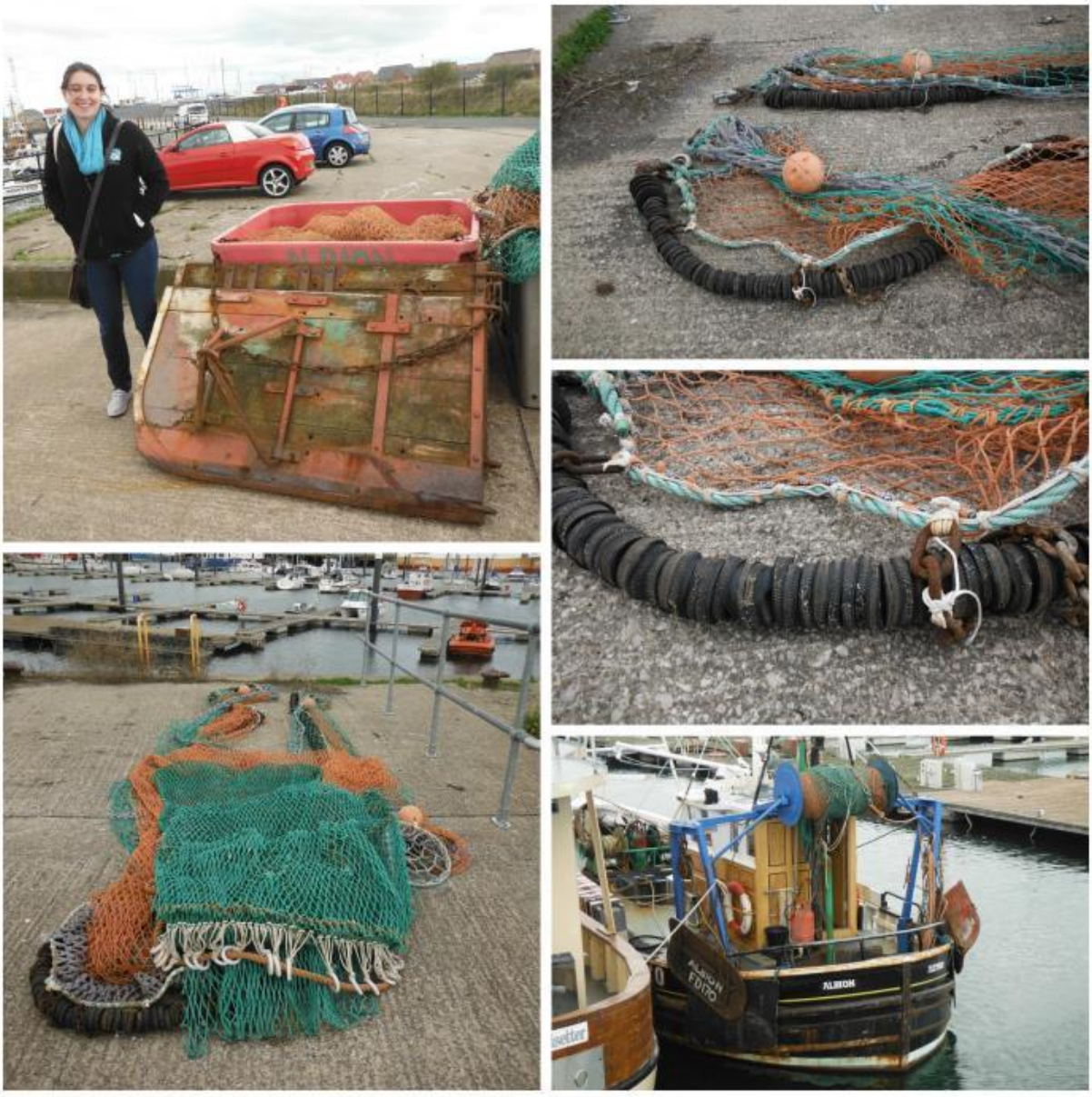

Figure 6. Fishing gear used by Mr Mitchinson. (Clockwise from Top Left) wooden otter boards, ground rope, ground rope, vessel with steel otter boards, trawl net October 2013 (NWIFCA. 2013)