

# Fisheries in EMS Habitats Regulations Assessment for **Amber** and **Green** risk categories

## NWIFCA-MB-EMS-UNDERSIZE MUSSEL SOUTH AMERICA HANDGATHERING AND DREDGE FISHERY

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### Site: Morecambe Bay and Duddon Estuary

European Designated Sites: UK0013027 Morecambe Bay Special Area of Conservation (SAC)  
UK9020326 Morecambe Bay and Duddon Estuary SPA  
UK11045 Morecambe Bay Ramsar  
UK11022 Duddon Estuary Ramsar

European Marine Site: **Morecambe Bay and Duddon Estuary**

### Qualifying Feature(s):

#### SAC and Ramsar

H1110. Sandbanks which are slightly covered by sea water all the time; Subtidal sandbanks

H1130. Estuaries

H1140. Mudflats and sandflats not covered by seawater at low tide; Intertidal mudflats and sandflats

H1150. Coastal lagoons

H1160. Large shallow inlets and bays

H1170. Reefs

H1220. Perennial vegetation of stony banks; Coastal shingle vegetation outside the reach of waves (NON MARINE)

H1310. *Salicornia* and other annuals colonising mud and sand; Glasswort and other annuals colonising mud and sand; Pioneer saltmarsh

H1330. Atlantic salt meadows (*Glaucopuccinellietalia maritima*)

H2110. Embryonic shifting dunes (NON MARINE)

H2120. Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes"); Shifting dunes with marram (NON MARINE)

H2130. Fixed dunes with herbaceous vegetation ("grey dunes"); Dune grassland (NON MARINE)

H2150. Atlantic decalcified fixed dunes (*Calluno-Ulicetea*); Coastal dune heathland (NON MARINE)

H2170. Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*); Dunes with creeping willow (NON MARINE)

H2190. Humid dune slacks (NON MARINE)

S1166. *Triturus cristatus*; Great crested newt (NON MARINE)

Natterjack Toad (NON MARINE)

#### SPA and Ramsar

A026 *Egretta garzetta*; Little egret (non-breeding)

A038 *Cygnus Cygnus*; Whooper swan (non-breeding)

A040 *Anser brachyrhynchus*; Pink-footed goose (non-breeding)

A048 *Tadorna tadorna*; Common shelduck (non-breeding)

A050 *Anas Penelope*; Wigeon - (non-breeding – Ramsar only)

A054 *Anas acuta*; Northern pintail (non-breeding)

A063 *Somateria mollissima*; Common eider (non-breeding – Ramsar only)

A067 *Bucephala clangula*; Goldeneye - (non-breeding – Ramsar only)

A069 *Mergus serrator*; Red-breasted merganser - (non-breeding – Ramsar only)

A130 *Haematopus ostralegus*; Eurasian oystercatcher (non-breeding)

A137 *Charadrius hiaticula*; Ringed plover (non-breeding)

A140 *Pluvialis apricaria*; European golden plover (non-breeding)

A141 *Pluvialis squatarola*; Grey plover (non-breeding)

A142 *Vanellus vanellus*; Lapwing - (non-breeding – Ramsar only)

A143 *Calidris canutus*; Red knot (non-breeding)

A144 *Calidris alba*; Sanderling (non-breeding)

A149 *Calidris alpina alpina*; Dunlin (non-breeding)

A151 *Calidris pugnax*; Ruff (non-breeding)

A156 *Limosa limosa*; Black-tailed godwit (non-breeding)

A157 *Limosa lapponica*; Bar-tailed godwit (non-breeding)

A160 *Numenius arquata*; Eurasian curlew (non-breeding)

A162 *Tringa totanus*; Common redshank (non-breeding)

A169 *Arenaria interpres*; Ruddy turnstone (non-breeding)

A176 *Larus melancephalus*; Mediterranean gull (non-breeding)

A183 *Larus fuscus*; Lesser black-backed gull (Breeding, non-breeding)

A184 *Larus argentatus*; Herring gull (Breeding)

A191 *Sterna sandvicensis*; Sandwich tern (Breeding)

A193 *Sterna hirundo*; Common tern (Breeding)

A195 *Sterna albifrons*; Little tern (Breeding)

*Phalacrocorax carbo*; Cormorant – (non-breeding – Ramsar only)

*Podiceps cristatus*; Great crested grebe - (non-breeding – Ramsar only)

Seabird assemblage

## Site sub-feature(s)/Notable Communities:

### SAC and Ramsar

**Sandbanks which are slightly covered by sea water all the time** – Subtidal coarse sediment, subtidal mixed sediments, subtidal sand, subtidal mud.

**Estuaries** - Intertidal mud, intertidal sand and muddy sand, intertidal mixed sediments, intertidal coarse sediment, intertidal rock, intertidal stony reef, intertidal biogenic reef: mussel beds, subtidal coarse sediment, subtidal mixed sediments, subtidal sand, subtidal mud, *Salicornia* and other annuals colonising mud and sand, Atlantic salt meadows (*Glauco-Puccinellietalia maritima*).

**Mudflats and sandflats not covered by seawater at low tide; Intertidal mudflats and sandflats** – Intertidal mud, intertidal sand and muddy sand, intertidal mixed sediments, intertidal seagrass beds, intertidal coarse sediment.

### **Coastal lagoons**

**Large shallow inlets and bays** – Intertidal mud, intertidal sand and muddy sand, intertidal mixed sediments, intertidal seagrass beds, intertidal coarse sediment, intertidal rock, intertidal stony reef, intertidal biogenic reef: mussel beds, intertidal biogenic reef: *Sabellaria* spp., subtidal stony reef, circalittoral rock, subtidal coarse sediment, subtidal mixed sediments, subtidal sand, subtidal mud, *Salicornia* and other annuals colonising mud and sand, Atlantic salt meadows (*Glauco-Puccinellietalia maritima*).

**Reefs** – Circalittoral rock, intertidal biogenic reef: mussel beds, intertidal biogenic reef: *Sabellaria* spp., intertidal rock, intertidal stony reef, subtidal stony reef.

### **Perennial vegetation of stony banks: Coastal shingle vegetation outside the reach of waves**

***Salicornia* and other annuals colonising mud and sand: Glasswort and other annuals colonising mud and sand; Pioneer saltmarsh**

**Atlantic salt meadows** (*Glauco-Puccinellietalia maritima*) (referred to as Saltmarsh)

### **Embryonic shifting dunes**

**Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes"); Shifting dunes with marram**

**Fixed dunes with herbaceous vegetation ("grey dunes"); Dune grassland**

**Atlantic decalcified fixed dunes (*Calluno-Ulicetea*); Coastal dune heathland**

**Dunes with *Salix repens* spp. *Argentea* (*Salicion arenariae*); dunes with creeping willow**

### **Humid dune slacks**

**Great crested newt (*Triturus cristatus*)**

**Supporting habitat:** Great crested newt (NON MARINE) – coastal sand dunes  
Natterjack Toad (NON MARINE)- coastal sand dunes

### SPA and Ramsar

Annual vegetation of drift lines, Atlantic salt meadows (*Glauco-puccinellietalia maritima*), coastal lagoons, freshwater and coastal grazing marsh, intertidal biogenic reef: mussel beds, intertidal coarse sediment, intertidal mud, intertidal rock, intertidal sand and muddy sand, intertidal seagrass beds, intertidal stony reef, *Salicornia* and other annuals colonising mud and sand, water column.

## Generic sub-feature(s):

Intertidal mud and sand, Intertidal mud, Seagrass, Saltmarsh spp., Brittlestar beds, Subtidal muddy sand, Intertidal boulder and cobble reef, Subtidal boulder and cobble reef, *Sabellaria* spp. reef, Intertidal boulder and cobble reef, Surface feeding birds, Estuarine birds, Intertidal mud and sand, Intertidal boulder and cobble reef, Saltmarsh spp., Coastal lagoons.

## High Level Conservation Objectives:

### Morecambe Bay SAC

With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed above), and subject to natural change;

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 qualifying natural habitats and habitats of qualifying species
- ☐ The structure and function (including typical species) of qualifying natural habitats
- ☐ The structure and function of the habitats of qualifying species
- ☐ The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
- ☐ The populations of qualifying species, and,
- ☐ The distribution of qualifying species within the site.

### Morecambe Bay SPA

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified and the Ramsar Site and the wetland habitats and/or species for which the site has been listed (the 'Qualifying Features' listed above), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive and ensure that the site contributes to achieving the wise use of wetlands across the UK, by maintaining or restoring:

- ☐ The extent and distribution of the habitats of the qualifying features
- ☐ The structure and function of the habitats of the qualifying 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.

### **Duddon Estuary SPA**

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified and the Ramsar Site and the wetland habitats and/or species for which the site has been listed (the 'Qualifying Features' listed above), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive and ensure that the site contributes to achieving the wise use of wetlands across the UK, by maintaining or restoring:

- ☐ The extent and distribution of the habitats of the qualifying features
- ☐ The structure and function of the habitats of the qualifying 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.

### **Lune Marine Conservation Zone (MCZ)**

The site is designated for smelt (*Osmerus eperlanus*) with a recover objective.

Updated conservation advice for Morecambe Bay and Duddon Estuary SPA.

Changes specific to this HRA:-

- Grey plover, dunlin, sanderling and turnstone have a restore target for population due to declines in population exceeding regional and national trends.

## **Fishing activities assessed:**

### **Gear type(s):**

Hand-gathered – Undersize Mussel (*Mytilus edulis*)

Vessel dredge - Undersize Mussel (*Mytilus edulis*)

# **1. Introduction**

## **1.1 Need for an HRA assessment**

### **THE CONSERVATION OF HABITATS AND SPECIES REGULATIONS 2010 (AS AMENDED)**

The NWIFCA proposes to authorise an undersize (less than 45mm) mussel hand-gathered and vessel dredge fishery at the mussel bed known as South America situated in North Morecambe Bay. Authorisation will be by means of derogating against the minimum landing size for mussel in NWIFCA Byelaw 3, and issuing permits under NWIFCA Restrictions on the Use of a Dredge 2017. This proposal is classed as a plan or project and the area lies within a European designated site (also commonly referred to as Natura 2000 sites), and therefore has the potential to affect the designated features. European sites are afforded protection under the Conservation of Habitats and Species Regulations 2010, as amended (the 'Habitats Regulations'). The proposal site is within the Morecambe Bay and Duddon Estuary SPA and the Morecambe Bay Special Area of Conservation (SAC). The site is also listed as Morecambe Bay Ramsar site and also notified at a national level as Morecambe Bay Site of Special Scientific Interest (SSSI).

As a competent authority under the provisions of the Habitats Regulations, the NWIFCA should have regard for any potential impacts that a plan or project may have. Under the provisions of the Habitats Regulations, NWIFCA has undertaken an Appropriate Assessment of the proposal, in accordance with Regulation 61. Natural England is a statutory consultee on the Appropriate Assessment stage of the Habitats Regulations Assessment process, and their advice is incorporated into this document.

## **1.2 Proposal**

The NWIFCA proposes to authorise an undersize (less than 45mm) mussel hand-gathered and vessel dredge fishery at the mussel bed known as South America situated in North Morecambe Bay from Thursday 20<sup>th</sup> August am tide for the former and Monday 24<sup>th</sup> August pm tide for the latter. Authorisation will be by means of derogating against the minimum landing size for mussel in NWIFCA Byelaw 3 (para.6), and issuing permits under NWIFCA Restrictions on the Use of a Dredge 2017.

The purpose of this site specific assessment document is to assess whether or not in the view of NWIFCA the fishing activity of hand-gathering and vessel dredge of undersize mussel at the mussel bed known as South America located in North Morecambe Bay, has a likely significant effect on the qualifying features of the Morecambe Bay and Duddon Estuary European Site, and on the basis of this assessment whether or not it can be concluded that the activities will not have an adverse effect on the integrity of this European Site.

## 2. Information about the EMS

(See cover pages).

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

The Morecambe Bay and Duddon Estuary European Site interest features, boulder and cobble reef, *Sabellaria alveolata* reef and Seagrass beds are protected from all bottom towed gears, in addition Seagrass beds are protected from bait collecting or working a fishery by hand or using a hand operated implement through a prohibition under [NWIFCA Byelaw 6](#), introduced in May 2014.

## 4. Information about the fishing activities within the site

### 4.1 Background

It is important to note that mussel beds in Morecambe Bay are almost exclusively found on hard substrate - post-glacial moraine skears – and consequently respond quite differently to fishing pressures than in other fisheries such as the Wash in the UK and the Waddensee in the Netherlands where mussel beds are underlain by soft substrates. There are two distinct mussel resources in Morecambe Bay which can be highly variable in abundance and distribution. These are size mussel (>45mm), and undersize (seed and part-grown) mussel.

A feature of Morecambe Bay is the irregular but frequent occurrence of large and extensive mussel spat settlements. These settlements are usually very dense with little or no embyssment to the underlying substrate and quickly build up large amounts of sediment and pseudo-faeces (mussel mud). Within a very short space of time these populations become unstable and vulnerable to erosion through weather and/or tide, or predation from vast numbers of starfish. They are referred to as “ephemeral” beds (Dare, 1971 & 1976) and the Authority takes the line that although they are undersized they should be fished as early as possible as they would otherwise be washed out of the fishery and a valuable commercial resource lost. The mussel is fished, either by hand-raking or by specialised mussel dredgers, neither of which impact the cobble and boulder skears due to the deep soft mud layer on which the mussel sits. Removal of undersize has also been authorised over the years when huge swarms of common starfish (*Asterias rubens*) have been present on a bed, predating voraciously on mussel of varying sizes dependent on the size of the starfish and their ability to open the shells. The harvested mussel is re-deposited in other areas to grow on until of a commercially viable size. The number of mussel cultivation sites has grown in areas such as the Wash, Northern Irish and Irish loughs, and the Menai Strait, the latter of which is an MSC accredited sustainable fishery. Relaying in Morecambe Bay has been trialled unsuccessfully as the mussel, even though relaid in more sheltered areas, is unable to persist due to the prevailing environmental conditions.

Size mussel beds occasionally develop in areas such as Heysham Flat (lowest skears), the bottom end of Foulney and rarely in the Duddon Estuary (Hardacre). However, these are not regular in their occurrence, as in many years where mussel has been stable enough to resist wash out and has persisted through a winter it will become smothered in the following spring by the next heavy recruitment of spat. In addition, mussel at Foulney becomes ‘pearled’ at around 42-45mm and therefore not of great value commercially. Mussel on the upper parts of Foulney skear tend to become stunted and not grow much more than the 42-44mm range. Some of this may provide broodstock and some of these areas appear to be more biologically diverse; the Authority currently does not permit its removal.

Fishing effort for size mussel is low with only hand-gathering permitted and generally prosecuted by a maximum of 40 Byelaw 3 permit holders.

#### **4.2.1 Mussel Hand-gathering**

Hand-gathering of mussel has been a long-standing traditional fishery within Morecambe Bay and the Duddon Estuary. Methods have changed very little over the years, with a rake and net bag used to remove the mussel from the underlying muddy substrate. Fishermen access the beds mainly by ATVs and occasionally tractors due to the high risk of getting stuck in soft sediment. Depending on the area being fished, the time when the bed is uncovered and safe to get on to and return from, fishing time may be severely restricted. Tides in Morecambe Bay are notoriously dangerous for the inexperienced or risk-prone, with tidal ranges up to 10m. There is little to no by-catch associated with this fishery which is highly selective.

Hand-gathering of seed mussel is by written authorisation to current NWIFCA Byelaw 3 permit holders only. Areas permitted for harvest are incorporated into the authorisation conditions, along with any other restrictions. Seed mussel is transported, usually by road-freight, to its relaying destination.

#### **4.2.2 Mussel Dredge**

Dredging of undersize mussel for aquaculture has been a regular occurrence in Morecambe Bay since the 1960s. It had previously been managed by the North West and North Wales Sea Fisheries Committee (NW&NWSFC) under a 30 year Fishery Order - the Morecambe Bay Mussel Fishery Order (MBMFO) 1978 - whereby fishing could only be carried out by licensees of the Order. The SFC was the holder of the MBMFO and also the Menai Strait Several Order where it leased out areas for aquaculture. Thus mussel so harvested remained in the District. The MBMFO expired in 2009, and the administrative area for NWIFCA changed, removing North Wales and adding Cumbria to the old NW&NWSFC boundaries. NWIFCA managed the fishery from 2009 - 2017 by written authorisation. Under the Habitats Regulations and Birds Directives, an assessment of likely significant effect was carried out prior to authorising the fishery (plan or project), with the thinking that there was no likely significant effect due to the ephemerality of the mussel, and that the fishery made no difference to what was about to occur through natural processes. This approach to HRA changed following the Defra Revised Approach to Fisheries Management and now a full HRA taken through to Appropriate Assessment is required.

In 2017 NWIFCA introduced a dredge byelaw that prohibits dredge fishing of all types across the District unless specifically permitted by the Authority, in which case fishers must apply and pay for a permit, with a fee structure based on vessel length. Areas permitted for dredging are incorporated into permit conditions, along with any other restrictions.

Aquaculture is supported by Defra as an important route to future food security. Dredging of mussel for aquaculture has developed significantly with technology concentrating on gear with low environmental impact. Seed mussel dredgers scoop up the top layer of loose mussel and mussel mud, bringing the catch through the water giving the mud a chance to flush through the netting, and depositing the catch in open holds on-board. There is little by-catch associated with this fishery, with starfish, occasional shore crab and flatfish found in the catch.

Mussel is steamed straight to lays where it is flushed through the sides of the vessel and straight on to the bottom growing lays. In areas such as the Menai Strait where much of the Morecambe Bay mussel goes, operators work together to farm the mussel. Long-standing studies of what works in practice along with a wealth of research with Bangor University scientists has led to a method of moving mussel around to gain best growth potential and minimise losses from crab and starfish predation. Much of this depends on the size of mussel when wild caught and the strength of its shell.

#### 4.3.1 Regulation of Hand-gathering

NWIFCA regulates fisheries in its District through a suite of byelaws. Regulations relating specifically to hand-gathering of mussels in Morecambe Bay are listed below with the full text of the regulations in Annex 7.

NWIFCA Byelaw 3	Permit to fish for cockles and mussels
NWSFC Byelaw 13a	Cockles and mussels – management of the fishery
NWSFC Byelaw 16	Shellfishery – temporary closure

NWIFCA Byelaw 3 Permit to Fish for Cockles and Mussels (Annex 7) was introduced in 2012 and succeeded in creating vastly improved management of the fisheries creating a more professional and responsible group of fishers. Under these regulations, the number of permit holders has been reduced significantly. There are currently a maximum of 141 NWIFCA Byelaw 3 permits which could be issued for the 2020 – 2021 season for the whole NWIFCA District. Landings returns are a requirement of the byelaw.

Without a permit within the NWIFCA district it is still permissible when mussel beds are open for 5kg per person per day of size mussel to be collected for human consumption.

#### 4.3.2 Regulation of Dredge Fishery

Restrictions on the Use of a Dredge Byelaw 2017 - a District-wide byelaw that prohibits the use of a dredge for the exploitation of sea fisheries resources except in accordance with a permit issued under the byelaw. Landings returns are a requirement of the byelaw, which regulates the fisheries through a suite of flexible permit conditions specifying temporal and spatial restrictions among other measures.

#### 4.3.3 NWIFCA Un-written Policy on Seed Mussel

Naturally there is some competition between sectors for certain of the mussel resources, and in the past there have been major disagreements. Due to the make-up of IFCAs and the inclusion of fishery interests in committee members, these disagreements could at times dominate committee meetings. NWIFCA set up a separate stakeholder forum to remove these discussions from committee proceedings, called the Bivalve Mollusc Working Group (BMWG). Established in 2015 it is made up of NWIFCA officers, stakeholder representatives from all sectors of the fisheries along with Natural England and nature conservation representatives.

In 2017 BMWG agreed a definition of ephemerality in relation to the mussel resources to assist NWIFCA in making decisions on when mussel could be harvested as seed. These conditions are provided at Annex 10.

In addition to the variables outlined above affecting the recruitment and longevity of mussel within the Bay, the fact that the natural environment is highly changeable with sandbanks and channels shifting tens of metres overnight adds a further complexity to what can affect the stock on an annual if not seasonal basis. In light of the high unpredictability of stock and conditions NWIFCA scientists assess each bed to ensure that authorisation / permitting of seed mussel removal only occurs when the mussel is in a vulnerable condition. This is itself can be challenging as some areas in some years can only be accessed by boats drying out over low water.

In 2020 the coronavirus pandemic created issues for NWIFCA to use boats in its work and therefore it had not been possible to assess some mussel areas within the Bay - Small Island (Falklands) and Trailer Bank, off of Foulney Island.

#### 4.4 Biosecurity

Morecambe Bay is currently shellfish disease free and the Authority considers it a priority to maintain this status. The non-native species Japweed (*Sargassum muticum*) and Leathery Sea-squirt (*Styela clava*) have

previously been recorded within the area. In order to implement effective measures to prevent the introduction and / or spread of diseases or non-natives the Authority has developed and published a Biosecurity Plan, detailing controls and conditions that will be applied to all commercial shellfish activities. The Biosecurity Plan seeks to ensure that consignments and/or areas from which they come, are regularly and thoroughly checked for invasive non-native invasive species (INNS). An uncorroborated report of a Chinese Mitten Crab being found in the Walney Channel in 2018 led the NWIFCA to take the precautionary approach of carrying out quarterly monitoring and surveillance on Heysham Flat and Foulney mussel beds. Industry were also encouraged to carry out surveillance of stock removed from the fisheries and provided with copies of a Code of Practice. A publicity and awareness leaflet was distributed to the local community around Barrow, and discussions had with crab-tilers in the Walney Channel. The most recent survey was undertaken in March 2020. To date there have been no CMC found.

#### **4.5.1 Historic Status and Knowledge of Stock**

##### **4.5.1.1 Historic Research and Management**

As described in 4.2.2, harvesting undersize or seed mussel in Morecambe Bay has been carried out for many decades. The current Senior Scientist has eight years of experience in managing the resource and physically gaining access to the areas of South America and Falklands to inspect the stock, whether by quad bike when the sandbanks and channels are positioned to allow a dash across on large spring tides, or by drying out of a RIB and walking it, or of carrying out an air inspection from chartered helicopter. Her detailed knowledge dates back to 2011 when the largest area of exposed cobble and boulder covering an area estimated at 104 ha received an abundance of spat across its entirety producing an industry estimate of 20,000 - 30,000 tonnes of seed mussel by the summer. 12,500 tonnes of this was fished by vessels dredging, after which industry estimated around the same amount possibly remained. This theory is considered plausible: the previous Senior Scientist of the NW&NWSFC carried out thinning research on Heysham Flat seed mussel, and showed that harvest by rake on that skear made no difference to overall biomass, providing evidence to support the hypothesis that by harvesting and therefore thinning out the densely packed mussel, overall biomass can be increased by clearing areas for growth and reducing competition for food.

Research into the seed mussel of Morecambe Bay goes back much further, starting in 1968 when the Ministry of Agriculture Fisheries and Food (MAFF) scientists, and in particular Dr Peter Dare, classified Morecambe Bay mussel as ephemeral following their extensive work into the stocks, which complimented the work of SFC scientists (Annex 12). Committee minutes from 25<sup>th</sup> March 1971 are reproduced at Annex 11 showing the discussions around using the resources within the Bay for 'reseeding' other areas (aquaculture) as the stocks 'rarely survived to marketable size ... due to predation and to scouring of the banks by strong tidal currents and gales'. The minutes refer to mussel beds around Heysham, which the Authority now manages as a hand-gathered seed mussel fishery, and Roosebeck which appears to include the intertidal areas now referred to as Low Bottom and around the Seasalter oyster trestles. It specifically names South America as one such bed included in the Roosebeck description, assessing 4000 tonnes of mussel being harvestable. Noticeably Dr Dare stated that 'by the end of (September) or in October, 75 - 100% of the stock would have vanished as a result of gales damage and predation. The accumulated mud was also washed away during the winter leaving the area clear for fresh settlements of spat from January onwards'.

Further points made in the 1971 minutes are important in understanding the areas in question and the fishery interests:

- i. there is only a limited time during which seed could / can be harvested from the South America skear (by boat). The area was / is fishable by traditional dredging methods for only 8 weeks in the year (July - September). This is due to the weather and tides;
- ii. hand-gatherers also had / have an interest in the seed mussel but there were issues around land-ownership and access by vehicles to the stocks. It was specifically recorded that fishermen local to the Ulverston Coast Road had an interest in the Roosebeck area.

This committee item appears to be a precursor to the application for the MBMFO as a means of providing security of management over the resource for the 30 years of the life of the Order.



#### 4.5.1.2 Variability of Stock and Conditions

Managing a resource such as mussel in Morecambe Bay is hugely problematic due to the highly dynamic environment in which it is found, the vagaries of mussel recruitment, changing weather patterns particularly associated with climate change, and variability of predator presence, particularly from common starfish. It is impossible to predict what will occur from one year to the next, and in times and places from one month to the next. NWIFCA holds decades of reports, stock assessments and photographic evidence on this resource, some of which is reproduced at Annexes 12 and 13, along with South America / Falklands dredge fishery data at Annex 14.

Morecambe Bay is basically underlain by vast areas of glacial moraine. These are surrounded by sandbanks and intertwining channels of varying depths and widths. The channels shift, sometimes hundreds of metres overnight. The sand also moves around, sometimes covering over the glacial moraine, sometimes leaving it exposed. Evidence of this was in recent years when Morecambe Bay Oysters, who have trestles for Pacific Oysters on the sands at Roosebeck, lost hundreds of thousands of pounds of stock when immense amounts of sand shifted on to the frames burying them.

Some areas of exposed moraine are relatively static due to their height on the shoreline and presumably shelter - Heysham Flat main skear, and Foulney Twist (main skear). The bottom ends of both of these areas have been sand covered in the past decade. Other areas are highly changeable and can change month on month, with areas that have been exposed one month, observed buried by a sand covering a month later.

Mussel needs a hard substrate on which to recruit, and when the moraine is exposed it provides ideal conditions. Where the brood stock for the dense aggregations seen in the Bay are situated has not been established. There are older mussel stocks positioned on the upper reaches of Foulney and Foulney Ditch in most years and these may act as breeding stock. However, some larval dispersal modelling by Bangor University, although not specifically focussed on Morecambe Bay mussel, has provided evidence to the hypothesis that brood stock actually lies much further south even within the Mena Strait, has credence.

When considering the data from Dr Dare that 0 - 25% of stock might remain following natural scour, wash out and predation, a fact also observed by NWIFCA scientists, and also that dredge fishing is never 100% efficient and that a percentage of stock will remain post-fishing, it is natural to assume that some of this remaining mussel may over-winter. Un-embysed seed mussel has an ability to 'hunker down' into the sediment when space allows in order to avoid the elements, particularly the effects of wind. This is commonly observed on Morecambe Bay mussel beds and can occur in coarse ground as well as soft. This provides some protection against scour. A frequent occurrence in the following spring is the next cohort of dense spat settling on top of this remaining mussel and smothering it. As the new mussel grows (rapidly) and puts down high levels of mussel mud, the older mussel disappears under this accumulation and generally dies.

A timeline of stock and fishing activity on South America for 2017 - 19 is shown in Table 1, and a summary of whether a fishery occurred is provided:

i. 2017 Decision / Fishery

Heliflight confirmed what had been seen on foot on South America that there was not sufficient stock and the condition of the stock and ground was not suitable for a dredge fishery.

ii. 2018 Decision / Fishery

Hand gathered: Undersize hand gathered fishery on South America and Falklands authorised at the request of Byelaw 3 permit holders, stock was mixed with some size and undersize. The larger mussel was evident in March and assumed to be overwintered 2017 stock.

South America and Falklands was open for 6 days on specific tides and was fished by 10 Byelaw 3 permit holders and 15 tonne of landings was reported.

Very little mussel remained on South America after fishing other than a new settlement around the edges of the exposed ground.

Dredge: Mussel did not put down mud and some cobble exposed - fishery not authorised.

iii. 2019 Decision / Fishery

Not sufficient stock for a dredge fishery. No hand-gathering took place.

Table 1: timeline of stock and fishing activity on South America for 2017 - 19

Date	Method	Mussel	Area	Cobble/Mud	Starfish
Apr-17	Industry - Heliflight (NWIFCA present)	No observed areas			
May-17	Industry - Heliflight (NWIFCA present)	No observed areas			
Jun-17	Industry - Heliflight (NWIFCA present)	No observed areas			
Jul-17	Industry - Heliflight (NWIFCA present)	New area with dense spat			None reported
Aug-17	NWIFCA - Quad	30% coverage 25mm mussel	3	Mussel that remained on sand (10cm), areas of scour and mussel mud, some bare cobble	No
Aug-17	Industry - Quad	Images provided of mussel and substrate confirming information above from NWIFCA inspection although density looks slightly higher from images.		As above	None reported
Mar 18	Industry – Quad	<b><u>30-40mm mussel present</u></b> Signs of 2018 settlement			None reported
Apr 18	NWIFCA – Quad	<b><u>35-45mm mussel present</u></b> Signs of 2018 settlement		Sandy substrate	No
May 18	Industry – Fishery Report	<b><u>Thin shelled mussel 40 - 45mm, 26-30% meat condition. Around 70% now size.</u></b>			None reported
May-18	NWIFCA – Quad	Most of the mussel has been fished. Surrounding areas have a 2018 settlement		Sandy substrate	No
Jun-18	Industry - Quad	Images provided of mussel		Sandy substrate	None reported
Jul-18	NWIFCA - Quad	All undersize, mainly 20-30mm with 10-20% cover	0.5	Sandy substrate	No
Mar-19	NWIFCA - Quad	Area has sanded over			

***Lack of recruitment in the north of the Bay was witnessed by NWIFCA officers in 2019. Heysham Flat received its usual dense recruitment across its extent and it was unusual for it not to have settled in the north. Lack of recruitment in the north of the Bay is assumed to have benefitted the size mussel fishery on Foulney and the Walney Channel which has been prosecuted by low numbers of hand-gatherers since 2018 to present. It will also inevitably have benefited any over-wintering mussel remaining on the Falklands and South America beds in as much as they would not have been subjected to smothering and competition from new dense recruits.***

#### 4.5.2 Current Status of Stock

Access to the mussel bed at South America can be problematic due to tide size required, and shifting sandbanks and channels. The actual area of exposed cobble and boulder on which the mussel recruits also changes annually and can indeed alter during a season. In 2020 the area holding mussel at South America was accessed on three occasions by NWIFCA science and enforcement officers. The areas of Falklands and Trailer Bank have not been accessed by NWIFCA officers due to coronavirus restrictions, but are accepted as holding large quantities of size mussel (industry reports), most likely 2018 age class.

##### South America Mussel Inspection (Quad) 13/03/20

LW: 08:10 0.7m (Liverpool tides)

An area of cobble had been exposed in the South America area. The area was approximately 1km north of the area authorised for an undersized hand-gathered fishery in May 2018. The area was mapped and estimated at **5.8 hectares in size**. **The area had received a significant 2020 mussel settlement** as shown in Figures 2 to 4. **There was no other size class of mussel in evidence**. Figure 5 shows an area to the south west of the exposed ground that had live *Sabellaria alveolata* which had mussel settlement on it. NB. Solocator app malfunctioned so photographs taken by JH are not georeferenced.

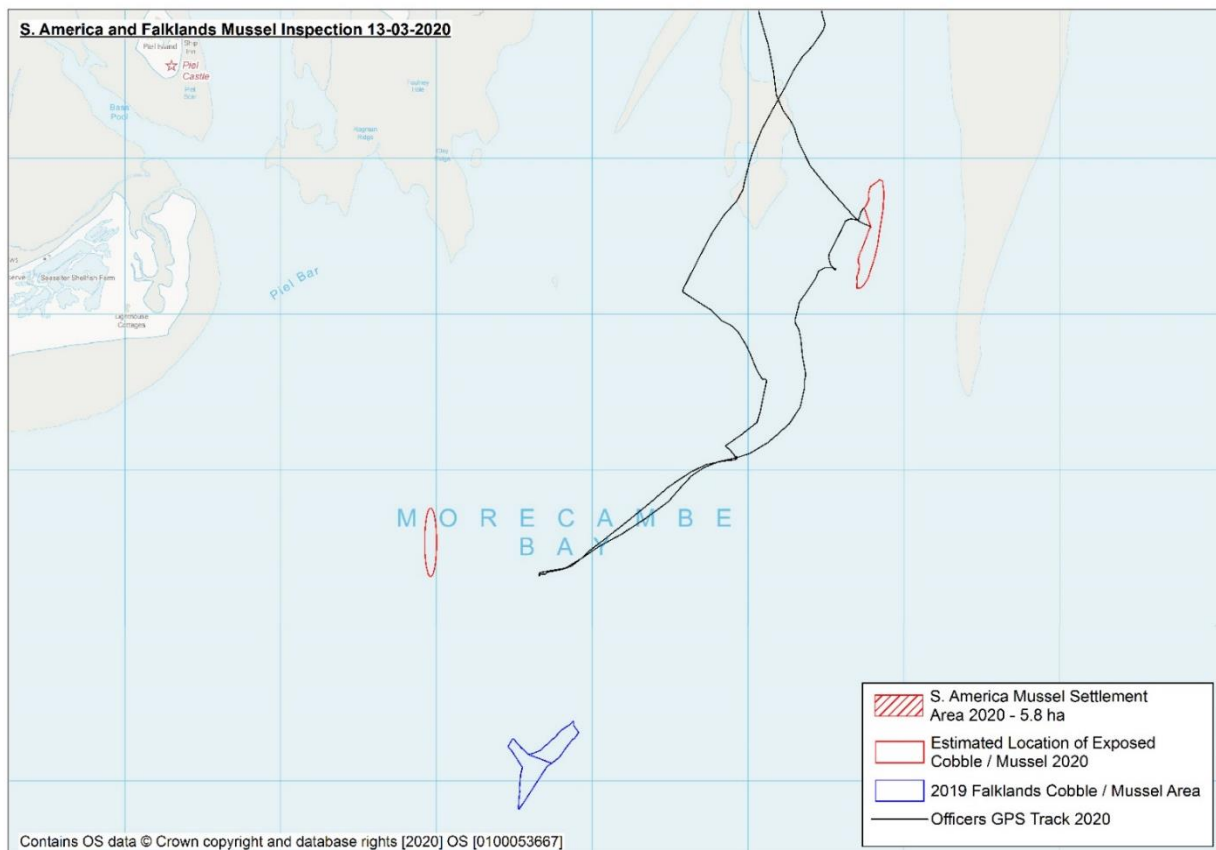


Fig. 1 Map of an area of mussel on South America, an estimated location of exposed ground in the channel and the 2019 location of Falklands.



Fig 2 – Overview of the area of mussel on S. America looking north 13/03/20



Fig 3 – Overview of the area of mussel on S. America looking south 13/03/20





Fig. 4 – 2020 Mussel Settlement on low lying *Sabellaria alveolata* on S. America 13/03/20



Fig. 5 – Live *Sabellaria alveolata* on the south west of the exposed ground 13/03/20

South America Mussel Inspection (Quad) 07/06/20



LW: 07:30 1.0m (Liverpool tides)

An inspection on the area of mussel that was previously reported in March 2020 that had received a significant settlement was completed. The area was of a similar size, estimated at **5.9 hectares** and **the mussel had grown and was approximately 10mm**. The **mussel is sat on a layer of muddy sand with very little exposed hard substrate** other than where no mussel is present at the North end. The mussel extended into the water to the South and Southwest of the area mapped. Due to time limitation and the tidal height the full extent of the mussel could not be mapped. To the north and west the mussel did not extend into the water and to the west there was a sand bank present. Figures 6 to 10 show the extent and condition of the mussel. Figure 11 shows an area to the south of the area which had live *Sabellaria alveolata* present **which is now covered by seed mussel**.

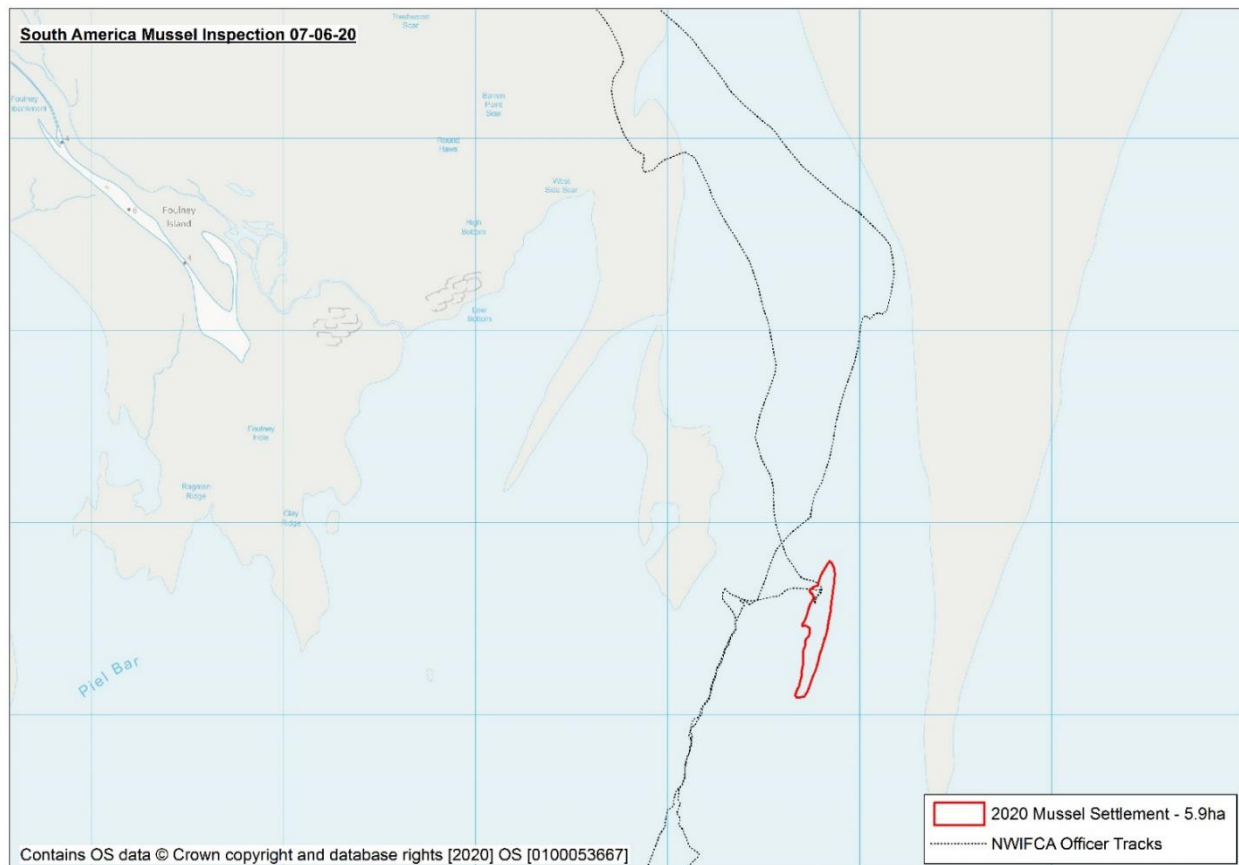


Fig. 6 – Extent of mussel on S. America and NWIFCA officers tracks 07-06-20



Fig 7 – Overview of the area of mussel on S. America looking north 07-06-20

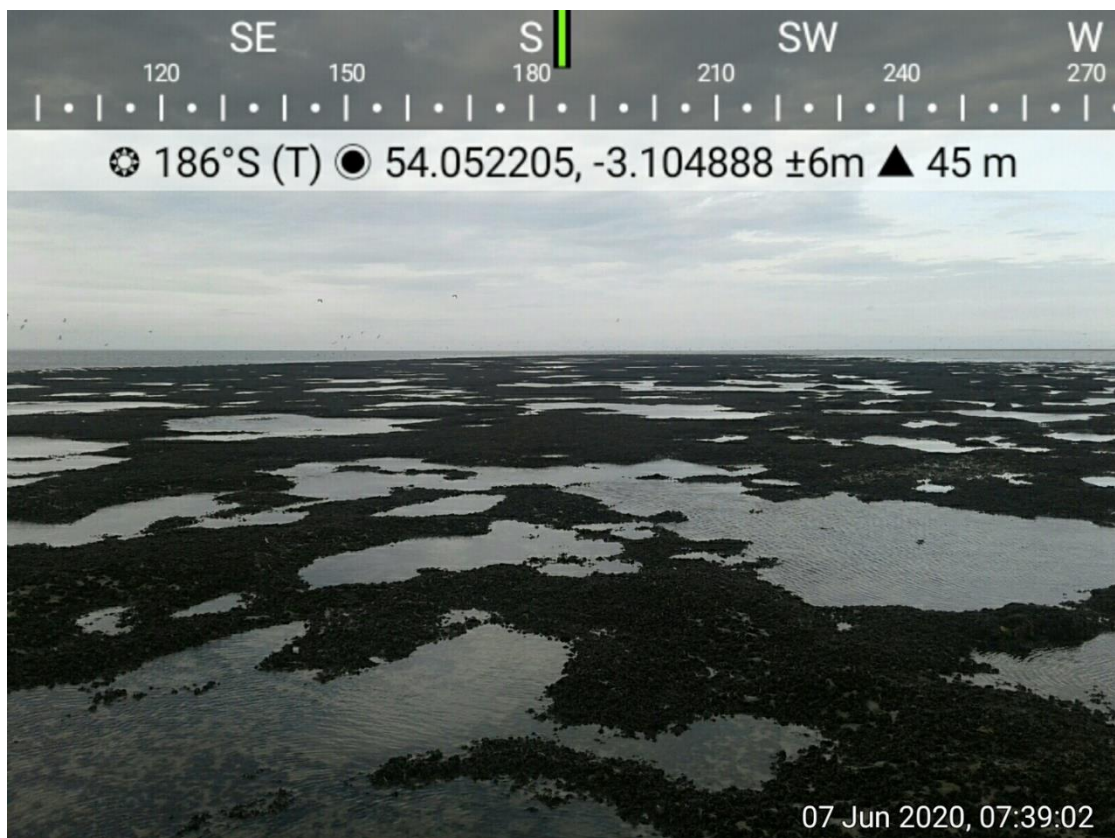


Fig 8 – Overview of the area of mussel on S. America looking south 07-06-20





Fig. 9 – South America Seed Mussel 07-06-20



Fig. 10 – South America Seed Mussel 07-06-20



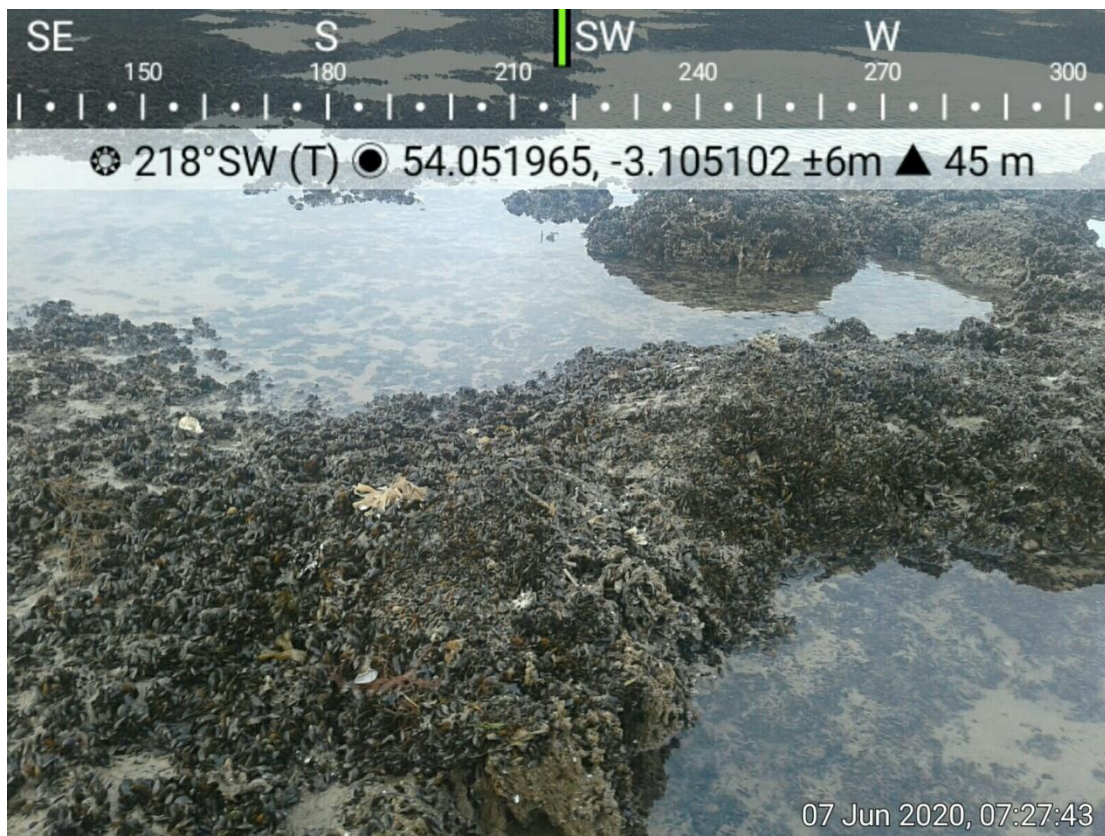


Fig. 11 –*Sabellaria alveolata* with a significant mussel settlement 07-06-20

#### South America Mussel Inspection (Quad) 24/07/20

LW: 10:15 1.1m (Liverpool tides)

Officers successfully accessed the South America mussel area indicated in the mapping below by quad bike, and carried out a foot inspection. **The ground was too soft to put the quad bikes on due to the layer of mud beneath the mussel.** One officer tracked round the outer perimeter of the mussel area while the other inspected the stock. **The stock area was estimated at 9.5ha** ie. the stock **had either spread out as it had grown** to cover a larger area than in March and June, or an **increased amount had 'come up' from beneath the low water level as the layer of mud increased.** IFCO Dixon immediately remarked on seeing it uncover that the area was larger than in the June inspection. The mussel area lay in a horseshoe shape with the middle section devoid of mussel and showing bare cobble. Due to time constraints of the tide only the outer fringe of the mussel area was tracked - the inner bare area, and therefore the total area holding mussel, has been estimated from observations and in mapping software (Fig. 12).

**The mussel was consistent in size across the whole area - around 25mm. This mussel was sitting on a layer of mud ranging from around 25cm to 50 cm deep.** shown in Figures 13 - 18, and 20. The mud was generally loose and difficult to walk over.

**There was no size mussel evident.** Starfish were rare. There was some **evidence of scour** in the northern area and the bed appeared to extend into the water to the east. As the tide ebbed off and revealed the western edge, this consisted of occasional mussel and mainly sand. One small clump of *Sabellaria alveolata* was observed which was struggling to compete with the surrounding mussel and mud. The large areas of live *Sabellaria alveolata* observed in March was no longer evident. **The mussel was becoming loose and unstable.**

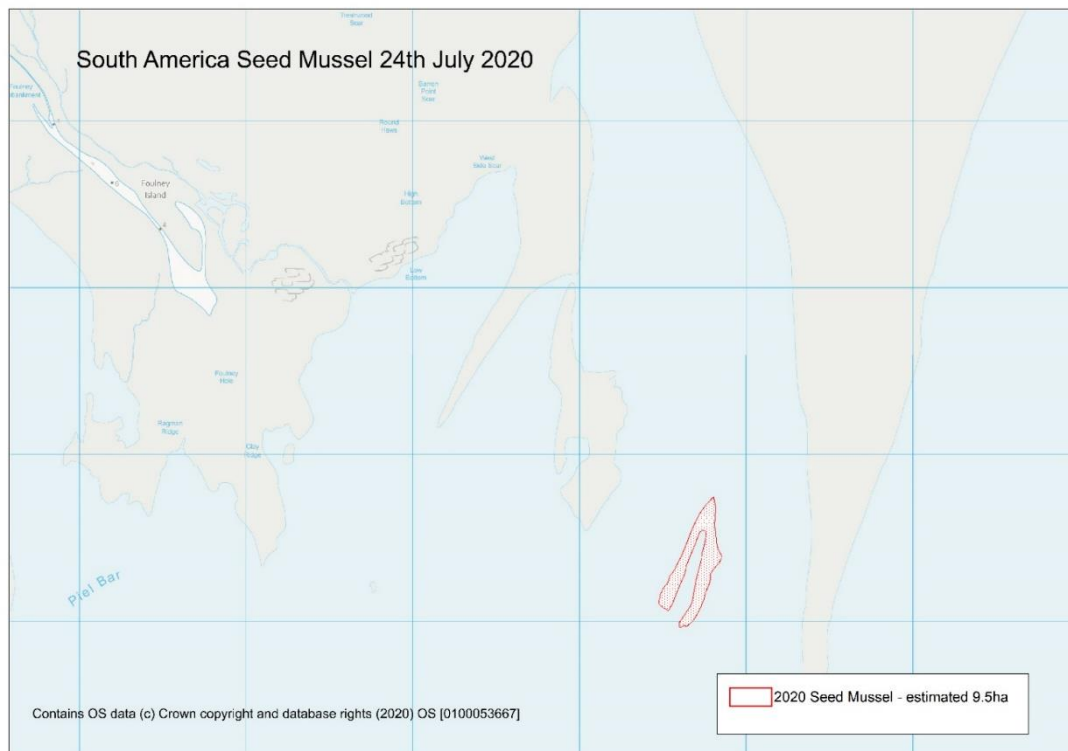


Fig. 12 – Estimated extent and position of seed mussel on South America 24-07-20

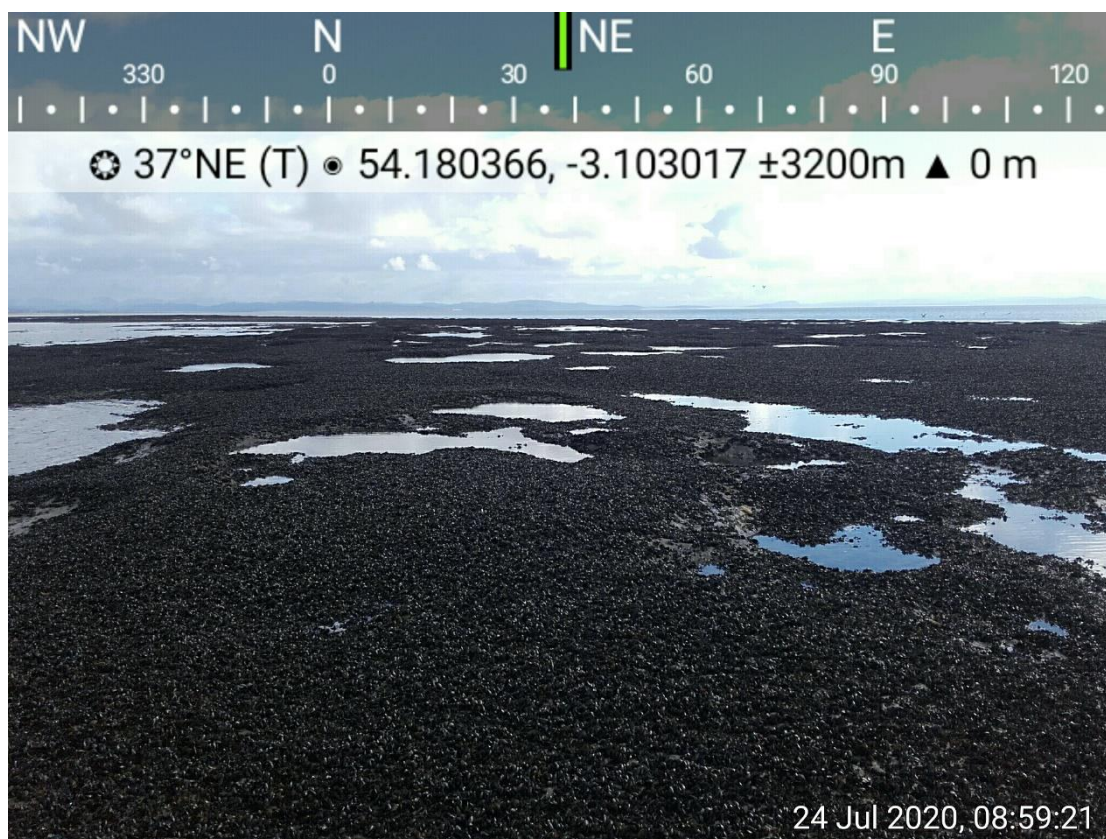


Fig 13 – Illustration of density and consistency of seed mussel 24-07-20





Fig 14 – Bare area in centre of horsehose shape - officer can be seen in the distance  
tracking round the southern edge 24-07-20



Fig. 15 – Bare cobble showing in the gap between the two sides of mussel area 24-07-20





Fig 16 – Evidence of thickness of mud layer beneath the mussel 24-07-20



Fig 17 – Evidence of scour 24-07-20



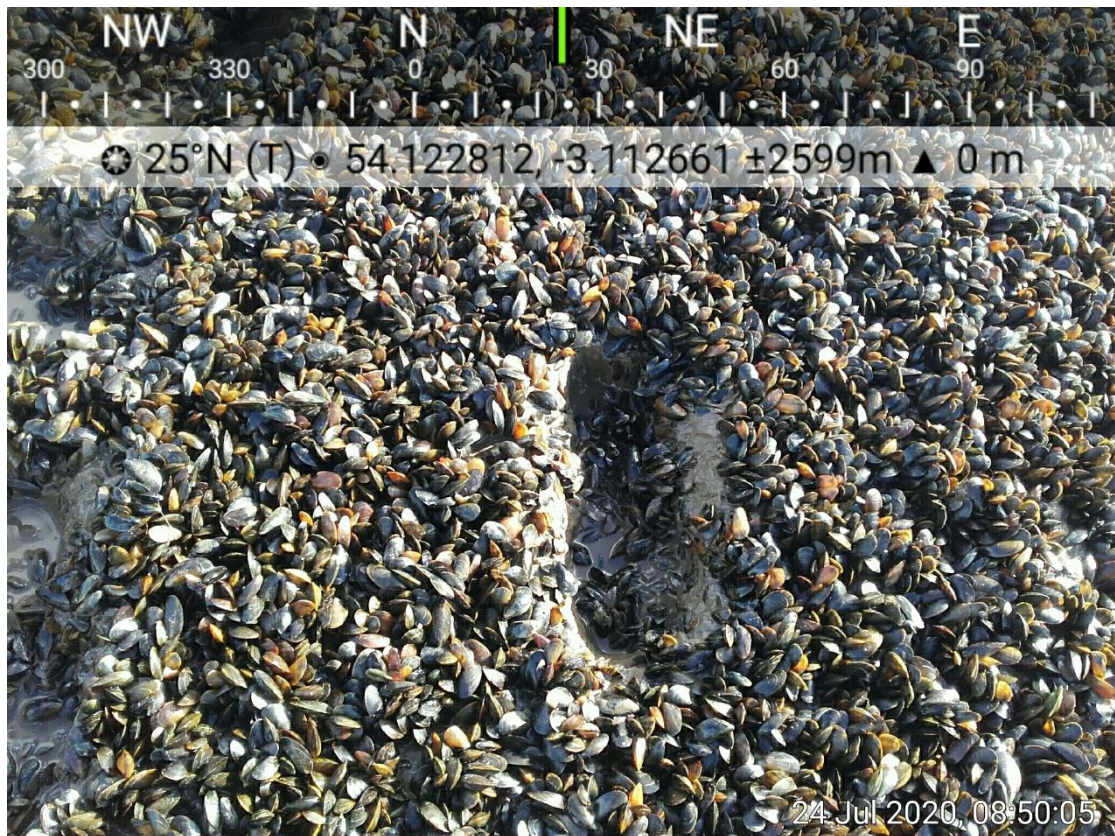


Fig 18 – evidence of typical looseness of mussel 24-07-20

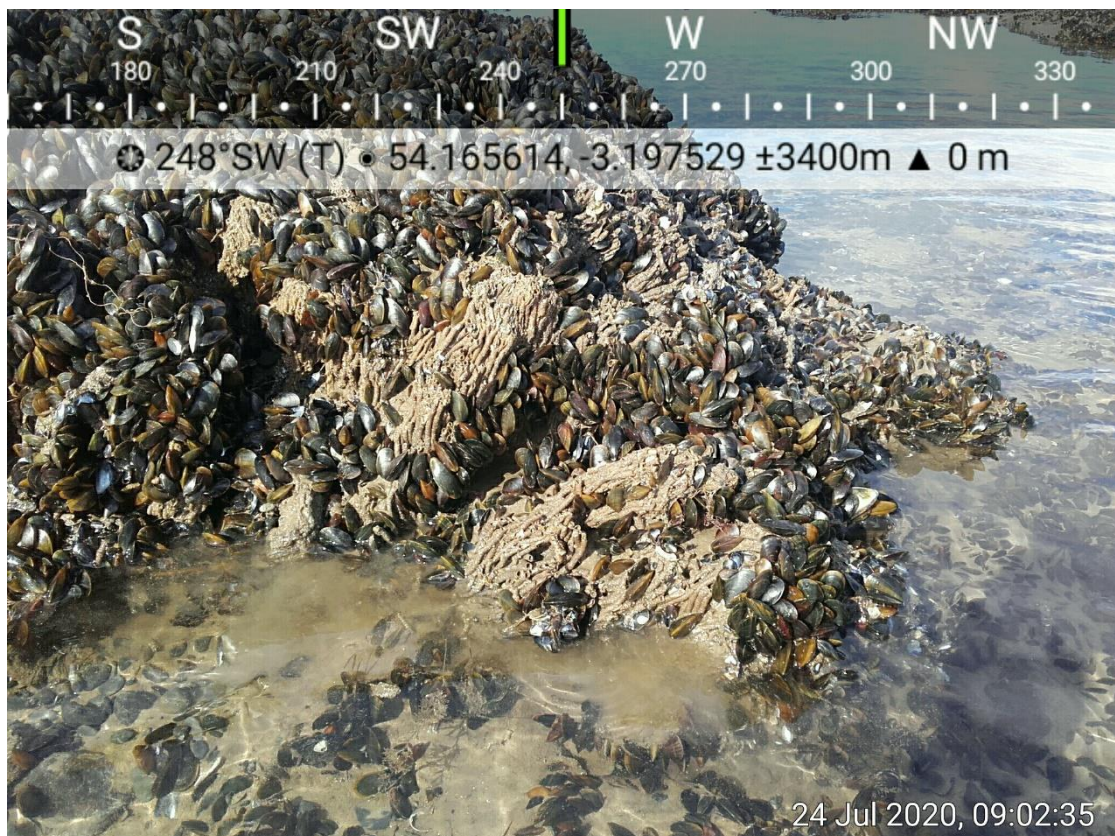


Fig 19 - one clump of *Sabellaria alveolata* observed, showing the competition between it and the mussel 24-07-20





Fig 20 - illustration of size of the mussel against size 7 boot. 24-07-20

***The all important factor to recognise on South America in July 2020 is that this stock is all of one year class, and all of the same size range, therefore indicating the same recruitment. There is no sign of any larger or over-wintered mussel from previous years. There is only one area of exposed cobble - that which runs down the centre of the horseshoe shape which will provide a natural divide between the two fishing methods. The mud on which the mussel sits is consistently thick and loose and already showing signs of scour. Unlike some of the other beds in north Morecambe Bay in 2020, namely Trailer Bank and Small Island (Falklands), which hold amounts of persisting mussel from previous years, South America is clearly showing signs of condition indicating ephemerality. This will be monitored to provide evidence to inform the fisheries' management in future years.***

#### **4.6 Decision by NWIFCA Technical Science and Byelaws Sub-Committee (TSB)**

A virtual meeting of the NWIFCA TSB was held on 4<sup>th</sup> August 2020, where views of the hand-gathering and dredge sectors were heard. The NWIFCA Senior Scientist recommended that the area be opened as a seed mussel fishery to both sectors as soon as possible as the resource appeared to be in the process of becoming highly unstable and liable to wash out. Hand-gatherers asked for the resource to be left to grow to size. The dredge sector asked for the fishery to be opened. TSB heard evidence and discussion from both sides and approved that the seed mussel fishery at South America be allowed, subject to HRA approval, for dredge and hand gathering for a period of one month from the date of authorisation. The division of the fishery shall be equal with the hand gatherers operating on the western side. Further management decisions will be considered after review - with the intention for the area to be inspected by NWIFCA officers post one month to assess next steps at which point the fishery may be extended / division of resource changed.

#### **4.7.1 Information on Fishing Activity - Hand-gathering**

The proposed fishery will initially be permitted under written authorisation against NWIFCA Byelaw 3 para. 6, minimum landing size to all NWIFCA byelaw 3 permit holders. This will give them the opportunity to fish it first over spring tides. Knowledge of recent activity levels and information on UK open cockle fisheries suggest that a maximum of 30 byelaw 3 permit holders per tide will prosecute the fishery. If more than this number is reported the HRA will be reassessed. Due to the location of the bed, the tide limits the days and amount of time the bed can be fished, with fishing time being approximately one to two hours over low water. The access of the bed is also very weather dependent with strong winds from the northwest, west and southwest restricting access. There is also a possibility that no hand-gathering will occur on it as size mussel fishing is still on-going at Foulney, with size mussel fetching a greater price at market than seed. Come 1<sup>st</sup> September the NWIFCA will open some cockle beds in the Bay, and it is predicted that attention will divert to this higher value resource.

#### **4.7.2 Information on Fishing Activity - Dredge**

Two permits are currently issued for seed mussel dredging within the District - for mussel on the Wyre Estuary / Fleetwood beds. It is expected that these two vessels will also fish South America. Due to the fee for permits and the limited area of seed at South America is it unlikely that any other companies apply, but if they did it would be a maximum of two others - one has shown interest but is undecided at the time of writing.

## 5. Test for Likely Significant Effect (LSE)

The 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<sup>1</sup>.

**Is the activity/activities directly connected with or necessary to the management of the site for nature conservation?** NO

### 5.1 Table 1: Assessment of LSE

**Features:** All qualifying features and sub-features have been screened out other than those in the table below, due to there being no interaction between the fishing activity and the qualifying features and sub-features.

**Pressures:** All pressures from the Advice on Operations table provided in the Morecambe and Duddon Estuary Conservation Advice package have been screened out, other than the pressures in the following table, due to the nature of the fishing activity.

Qualifying Feature	Sub-feature	Potential pressure(s)	Sensitivity	Potential for Likely Significant Effect?	Justification and evidence
H1130. Estuaries	Intertidal mud	Abrasion/disturbance of the substrate on the surface of the seabed	Sensitive	No	Activity does not occur within the vicinity of intertidal mud. Access to fishery will not be over the feature.
H1140. Mudflats and sandflats not covered by seawater at low tide; Intertidal mudflats and sandflats		Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion	Sensitive	No	
H1160. Large shallow inlets and bays					
SPA Supporting Habitats					
	Intertidal sand and muddy sand	Abrasion/disturbance of the substrate on the surface of the seabed	Sensitive	Yes	Hand-gathered access to fishery will be over feature but unlikely to have any impact in such a highly dynamic site, due to low levels of effort and number of tides available for fishing.
	intertidal mixed sediments, intertidal coarse sediment	Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion	Sensitive	Yes	Hand-gathered access to fishery will be over feature but unlikely to have any impact in such a highly dynamic site, due to low levels of effort and number of tides available for fishing.
					Boat access over high water and no impact on intertidal sand and muddy sand features. Potential for interaction with mixed and coarse sediments.

<sup>1</sup> Managing Natura 2000 sites: [http://ec.europa.eu/environment/nature/natura2000/management/guidance\\_en.htm](http://ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm)



		Intertidal stony reef	Abrasion/disturbance of the substrate on the surface of the seabed	Sensitive	Yes	Both hand-gathering and seed mussel dredge fishing remove the mussel from the surface of the seabed and there is potential for abrasion / disturbance / penetration of the substrate on and below the seabed.
		Intertidal biogenic reef: including mussel and Sabellaria communities	Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion	Sensitive	Yes	
			Genetic modification & translocation of indigenous species	Sensitive	No	The area is shellfish disease and INNS free. Industry are encouraged to use recognised procedures to ensure equipment is clean of INNS. Consignments are monitored closely through CEFAS shellfish hygiene inspections, and NWIFCA liaison with regulators in Ireland and North Wales to ensure risk of translocation is minimal
			Litter	Sensitive	Yes	Feature and pressure taken through to AA.
			Physical change (to another seabed type)	Sensitive	Yes	The mussel has settled on hard substrate of cobble and boulder skear. There is potential for removal of pebbles and cobbles from the fishery and hence a change to the seabed.
			Removal of non-target species	Sensitive	No	There is little or no by-catch in this highly selective fishery.
			Removal of target species	Sensitive	Yes	Feature and pressure taken through to AA.
						The proposal is to remove mussel from the skear. Mussel beds are a characteristic and fluctuating community of the intertidal boulder and cobble skear interest sub-feature.
SPA Habitats	Supporting	Supporting Habitats assessed above	Removal of target species (Mussels)	Some species sensitive, others screened out	Yes	Species sensitive to removal of mussels: <ul style="list-style-type: none"> <li>- Common eider</li> <li>- Eurasian oystercatcher</li> <li>- Red knot</li> <li>- Herring gull</li> </ul>
			Removal of non-target species	Sensitive	No	Highly selective fishery. No by-catch or discards of non-target species.
			Visual disturbance	Sensitive	Yes	All species taken through to AA
A026 <i>Egretta garzetta</i> ; Little egret A038 <i>Cygnus Cygnus</i> ; Whooper swan A040 <i>Anser brachyrhynchus</i> ; Pink-footed goose A048 <i>Tadorna tadorna</i> ; Common shelduck A050 <i>Anas Penelope</i> ; Wigeon A054 <i>Anas acuta</i> ; Northern pintail A063 <i>Somateria mollissima</i> ; Common eider (Breeding) A067 <i>Bucephala clangula</i> ; Goldeneye A069 <i>Mergus serrator</i> ; Red-breasted merganser A130 <i>Haematopus ostralegus</i> ; Eurasian oystercatcher A137 <i>Charadrius hiaticula</i> ; Ringed plover						

A140 *Pluvialis apricaria*;  
European golden plover

A141 *Pluvialis squatarola*; Grey plover

A142 *Vanellus vanellus*;  
Lapwing

A143 *Calidris canutus*;  
Red knot

A144 *Calidris alba*;  
Sanderling

A149 *Calidris alpina alpina*; Dunlin

A151 *Calidris pugnax*;  
Ruff

A156 *Limosa limosa*;  
Black-tailed godwit

A157 *Limosa lapponica*;  
Bar-tailed godwit

A160 *Numenius arquata*;  
Eurasian curlew

A162 *Tringa totanus*;  
Common redshank

A169 *Arenaria interpres*;  
Ruddy turnstone

A176 *Larus melancephalus*;  
Mediterranean gull

*Phalacrocorax carbo*;  
Cormorant

*Podiceps cristatus*;  
Great crested grebe

A183 *Larus fuscus*;  
Lesser black-backed gull (Breeding)

A184 *Larus argentatus*;  
Herring gull (Breeding)

A191 *Sterna sandvicensis*; Sandwich tern (Breeding)

A193 *Sterna hirundo*;  
Common tern (Breeding)

A195 *Sterna albifrons*;  
Little tern (Breeding)

Seabird assemblage

Waterbird assemblage

<p><b>Is the potential scale or magnitude of any effect likely to be significant?<sup>2</sup></b></p>	<p><b>Alone</b></p> <p>Yes</p> <p><b>Comments :</b></p>	<p><b>OR In-combination<sup>3</sup></b></p> <p>Yes</p> <p><b>Comments :</b></p> <p>These activities also occur at the site:</p> <ul style="list-style-type: none"> <li>• Beam Trawl (Shrimp)</li> <li>• Pots and Creels</li> <li>• Light otter trawl (Fish)</li> <li>• Drift and Fixed nets (including stake)</li> <li>• Longlines</li> <li>• Shrimp push-net</li> <li>• Hand working (mussels)</li> <li>• Hand-working (cockles)</li> </ul>
<p><b>Have NE been consulted on this LSE test? If yes, what was NE's advice?</b></p>	<p>No - NWIFCA consider AA required</p>	

<sup>2</sup> Yes or uncertain: completion of AA required. If no: LSE required only.

<sup>3</sup> If conclusion of LSE alone an in-combination assessment is not required.

## 6. Appropriate Assessment

### Potential risks to features

#### 6.1 Potential risks to SAC and SPA supporting habitat features

- Intertidal mixed sediments, intertidal coarse sediment
- Intertidal biogenic reef: including mussel and *Sabellaria alveolata* communities

##### 6.1.1 Pressures and Potential Impacts

- i) Abrasion/disturbance of the substrate on the surface of the seabed
- ii) Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion

i) and ii) assessed together - both hand-gathering and seed mussel dredge fishing remove the mussel from the surface of the seabed and there is potential for abrasion / disturbance / penetration of the substrate on and below the seabed from the use of rakes and dredges.

- iii) Litter

Past hand-gathered fisheries have had a poor reputation for large amounts of litter being deposited on the parking and access areas, and being left on the fishery. Items have included food and drink receptacles, net bags and sacks. Potential impacts could include entanglement of fish and birds in the bags and sacks, and swallowing / entanglement by / of birds and mammals (both marine and terrestrial) of other litter.

- iv) Physical change (to another seabed type)

The mussel has settled on hard substrate of cobble and boulder skear. There is potential for removal of pebbles and cobbles from the fishery particularly from poorly worked dredges, and hence a change to the seabed type.

- v) Removal of target species from biogenic mussel bed communities

Potential to affect the presence and spatial distribution of feature communities, the presence and abundance of typical species and the species composition of component communities.

##### 6.1.2 Exposure

- i) Abrasion/disturbance of the substrate on the surface of the seabed
- ii) Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion

Hand-gathering: the mussel sits on a layer of soft substrate (mixture of mud, sand and sandy mud) which in places is over a metre thick. Hand-raking skims the mussel from its underlying sediment, with no contact with the cobble and boulder reef beneath.

Dredge harvest: the dredges used in the fishery have been developed over many years to impact the environment as little as possible by scooping the top layer (~10cm) of mussel and mud from the remaining layer and leaving the cobble substrate undisturbed.

There is a history of both of these fishery activities occurring on this area with no known impact to the underlying features. The NWIFCA is confident that due to the prevailing conditions of thick mud there ***is no risk of adverse effect on the integrity or conservation status of the designated features within the site.***

iii) Litter

Between 2016 – 2018 hand-gathered cockle fisheries have occurred on Leven Island, Flookburgh, Pilling Sands and Leasowe cockle beds and in most years there has been a fishery on Heysham Flat for seed mussel as well as ongoing size mussel fisheries around Morecambe Bay. There have only been a couple of reports of litter being an issue at these fisheries, which when highlighted to Byelaw 3 hand-gathers and buyers at the fishery have been sorted out and the litter has been cleaned up. There is a Code of Conduct (Annex 8) which sets out good practices for intertidal shellfish fisheries, which includes not leaving litter. When NWIFCA officers are inspecting the fisheries, they will be able to monitor levels of littering.

There is very little risk of littering from the vessel dredge fishery. Vessels are large and modern and have all facilities for dealing with litter aboard.

The NWIFCA is confident that littering will be minimal and controlled and monitoring will be in place to identify quickly if litter is a problem. Therefore litter ***poses no risk of adverse effect on the integrity or conservation status of the designated features within the site.***

iv) Physical change (to another seabed type)

Hand-gathering: this fishery is highly selective. Prices gained from buyers are based on weight minus any waste. Therefore gatherers specifically work to avoid removing any of the hard pebble and cobble substrate, and target areas that are easiest to fish with loose mussel on top of the sediment on top of the hard substrate.

Dredge harvest: the dredges used in the fishery have been developed over many years to impact the environment as little as possible by scooping the top layer (~10cm) of mussel and mud from the remaining layer and leaving the cobble substrate undisturbed. Concerns were raised in the recent past over certain sectors within the dredge fishery having caused problems with the cobble substrate in other areas. In order to provide confidence to the NWIFCA, landings were monitored by IFCOs, and also by administrators in the countries of destination of the seed. No issues were reported and the landings were described as 'clean' of rocks and debris.

The resource at South America sits on a layer of thick mud and therefore the NWIFCA is confident that removal of mussel by hand-gathering and dredge harvest poses ***no risk of adverse effect on the integrity or conservation status of the designated features within the site.***

v) Removal of target species - Intertidal biogenic reef: including mussel and *Sabellaria alveolata* communities

The fishery is only being authorised due to the high likelihood that the single year class of 2020 mussel will wash out along with much of the mud on which it sits. Therefore, this resource would be removed by natural events whether fished or not. Although attempts have been made over the years to identify where the mussel is washed to, it has never been found within the Bay and is believed to either wash right out into the wider Irish Sea or to die.

As shown from the NWIFCA inspections (above), in March there had been an expanse of healthy young *Sabellaria alveolata*. The June and July inspections provided information on the status of these colonies, which had become smothered by mussel spat as it grew and spread out. Only one small damaged clump was found on the July inspection. This is common if not almost guaranteed when certain conditions prevail, with NWIFCA scientists having over 12 years of experience recording such events on South America and annually on Heysham Flat. However to ensure confidence in this assumption NWIFCA specifically targets areas holding *Sabellaria alveolata* to ensure no risk to healthy viable reefs. This is not necessary in the South America fishery 2020 as no healthy worm reef persists.

NWIFCA is confident that removal of mussel by hand-gathering and dredge harvest poses ***no risk of adverse effect on the integrity or conservation status of the designated features within the site.***

## 6.2 SPA and Ramsar Features

- SPA and Ramsar birds

### 6.2.1 Potential Impacts

- i) Removal of target species (mussels) for Common eider, Eurasian oystercatcher, Red knot, Herring gull;

Mussels form part of an important prey resource for eiders, oystercatchers, knot and herring gull. If bird populations are to be maintained in healthy condition, sufficient shellfish to meet their demands must remain for them.

If fisheries remove essential prey and there is a lack of food, the impacts on these species will vary at different times of year. For example, prey resource requirements will be far greater during autumn and at the beginning of winter than at other times of the year, as enough resource needs to be present for all the birds to feed through the cold months, when energy requirements are higher. Over-wintering waders require to put on weight and get into best condition prior to migrations north for the summer, or they will not survive long flight distances and suffer high mortalities. Equally the breeding eider population of Morecambe Bay needs to get into prime condition prior to mating in order to reproduce successfully. This applies to both sexes but in particular to females who once on the nest do not feed again until ducklings have fledged, a period of up to three weeks. There have been concerns raised over the Bay's eider population, its sex ratio skew (3:1 males to females) and the lack of success in breeding.

Oystercatchers eat a range of sizes of mussels. Although the birds will eat alternative prey species when shellfish are scarce, these prey often are not as nutritious and do not enable birds to survive as well, and in such good body condition, as when shellfish are abundant (Atkinson et al 2003; Goss-Custard et al 2004).

Knot eat smaller bivalves with lower and upper size limits of around 5 and 12.5mm shell length respectively (Bell et al 2001).

Eiders generally feed on a mixed range of sizes of bivalves, although it is understood they will consume high quantities of small mussels when they are available.

Herring gulls fed on a range of sizes of bivalves with around 20mm thought to be the preferred size (Hilgerloh et al, 1997)

- ii) Visual disturbance - All SPA species within vicinity of fishery, on the saltmarsh access route and over the sandbanks.

Visual disturbance could impact on the condition of any of the listed bird species, by causing unnecessary energy expenditure if flushed and taking to flight. For birds feeding on the affected areas it could also reduce feeding times, and increase competition if birds are forced to concentrate into reduced feeding areas.

## 6.2.2 Exposure

i) Removal of target species (mussels) for Common eider, Eurasian oystercatcher, Red knot, Herring gull;

The mussel to be fished is most vulnerable to natural wash out and therefore would not be available to the birds whether fished or not. The size of the mussel to be removed by the fishing activity is in the 25 - 35mm size range and therefore outside of the typical feeding size range for knot, but within the feeding range for eider, oystercatcher and herring gull. Although no specific figures have been given for the bird food requirements for bivalve eating birds, using the summary of the cockle and mussel beds provided (Annex 6) and the reasons listed below, NWIFCA is confident that the bird food requirements are met for the site.

- fishing is never 100% efficient and neither method will remove all of the mussel from the bed
- removing its density and disturbing some of the mud could possibly have a stabilising effect for the remaining mussel
- the authorised area is small with an estimated area of 9.5ha
- all cockle beds within the European site are closed until 1<sup>st</sup> September due to the closed season giving alternative feeding areas
- there will be a limited number of hand-gatherers prosecuting the fishery with a maximum of 30 permit holders fishing over low water. While they fish South America they will not be fishing other beds
- very low levels of hand-gathering occurs on Foulney, Low Bottom and near the Walney Channel where an abundant stock of varying sizes of mussel provides alternative resource for the birds on more tides (higher on the beach in many places). Average numbers fishing are 6-8 permit holders
- a seed mussel fishery has been authorised on Heysham Flat from 3<sup>rd</sup> August 2020, where an abundant stock is present, with larger mussel on the lower skears. To date no activity has taken place partly due to cockle fisheries in other parts of the UK being open, and size mussel gathering on Foulney
- the dredge vessels will fish over high water on more neapy tides. They are naturally likely to remove more of the resource than hand-gatherers
- wader numbers are greatest during the winter months meaning feeding requirements are lower during this time
- plentiful cockle and mussel stock present on other beds (Annex 6)

***NWIFCA is confident that the removal of target species (mussel) will have no risk of adverse effect on the SPA features, which utilise mussel as a prey source and therefore have no risk of adverse effect on integrity or conservation status of the site.***

ii) Visual disturbance - All SPA species within vicinity of fishery, access route and over the sandbanks

Little egret have the potential to be disturbed when feeding. Little egret prefer to feed in shallow water 10cm to 20cm in depth (Kushlan & handcock 2005). There is potential for the birds to be disturbed by hand-gathering when tractors and quad bikes are travelling to and from the fishing areas and fishing. Little egret commonly feeds in solitary or in loose flocks (del hoyo et al. 1992), and therefore any disturbance is likely to affect only a few individuals and any displacement temporary and short lived for the following reasons:-

- the fishing can only occur for one to two hours over low water when the beds are uncovered on the larger spring tides
- the gatherers will only travel once to and from from the fishing area per tide
- the authorised area is small with an estimated total area of 9.5ha

Golden plover are only likely to feed in the intertidal areas when weather conditions are harsh and the ground is hard from frost on their normal inland feeding areas. Due to the fishing activity occurring in August - September it is unlikely that golden plover will be found near the fishery.

Dunlin, black tailed godwit, bar tailed godwits, curlew and redshank mainly target mudflats as their feeding grounds. Lapwing use a variety of habitats (marine and terrestrial), and when present on the intertidal they tend to target mudflats. The fishing activity does not occur on or near to mudflats. Redshank are found on saltmarsh and are known to nest on saltmarsh but the fishing activity does not occur on or near saltmarsh. All access to the fishing grounds by hand-gatherers is by established access routes, and by vessels from open sea over high water; visual disturbance is unlikely.

Oystercatcher, ringed plover, grey plover, knot, sanderling and turnstone all feed on a variety of substrates in the intertidal area. Waders will move in and out with the tide feeding in and on the sediment, each wader will have a preferred prey source and size. Travel by hand-gatherers to and from the authorised area and fishing has the potential for disturbance. Visual disturbance to Oystercatcher, ringed plover, grey plover, knot, sanderling and turnstone will be minimal and any displacement temporary and short lived for the following reasons:

- fishing by hand-gatherers can only occur for one to two hours over low water when the beds are uncovered on the larger spring tides
- the gatherers will only travel once to and from the fishing area per tide
- the authorised area is small with an estimated total area of 9.5ha
- all cockle beds within the European site are closed until 1<sup>st</sup> September due to the closed season giving alternative feeding areas
- there will be a limited number of hand-gatherers prosecuting the fishery with a maximum of 30 permit holders fishing over low water. While they fish South America they will not be fishing other beds
- very low levels of hand-gathering occurs on Foulney, Low Bottom and near the Walney Channel where an abundant stock of varying sizes of mussel provides alternative resource for the birds on more tides (higher on the beach in many places). Average numbers fishing are 6-8 permit holders
- a seed mussel fishery has been authorised on Heysham Flat from 3<sup>rd</sup> August 2020, where an abundant stock is present, with larger mussel on the lower skears. To date no activity has taken place partly due to cockle fisheries in other parts of the UK being open, and size mussel gathering on Foulney
- the dredge vessels will fish over high water on more neapy tides - ie. at times when the birds will be resting or feeding on inshore / inland sites.
- plentiful cockle and mussel stocks present on other beds (Annex 6)

Shelduck, pintail and wigeon spend a proportion of their time feeding on intertidal mud. The fishing activity does not occur on or near to mudflats meaning disturbance is unlikely. Red breasted merganser, cormorant and great crested grebe spend the majority of time on the water, so there will be minimal to no disturbance from an intertidal fishery accessed from the shore. Whooper swans and pink footed geese numbers are greatest during the winter, and as the fishery is in August to September and for a short period of time disturbance is likely to be minimal if any.

Eiders are known to feed on submerged mussels at shallow depths (2-3m) (Larsen & Guillemette 2000) and are regularly observed at or near to the Falklands beds, Foulney Island, Low Bottom, Morecambe and Fleetwood. Visual disturbance to Eiders by the fishing activity will be minimal and any displacement temporary and short lived for the following reasons:



#### Hand-gathering:

- no visual disturbance to feeding eiders from hand-gatherers as feeding on different tides to the fishing activity
- eiders loafing or resting on the exposed intertidal areas are mainly around Foulney and Walney Channel which is not part of the access route to South America. Those resting on the sands may be minimally disturbed as the quad bikes pass once on the way to the fishery and once on the way back over a low number of tides. They may have become habituated to this activity due to the regular quad bike access on to the Foulney mussel bed.

#### Dredge harvest:

- the area is very small - estimated as 4.75ha for the dredge fishery. There are extensive areas holding large mussel around Foulney and Walney Channel which will be undisturbed over high water
- it is likely that only two boats will prosecute the fishery and that the fishery will be exhausted within a matter of days fishing
- fishing lasts around 4-5 hours over high water at which point the boats are likely to move offshore until the next tide
- once the vessel has taken a load it has to steam back for a day or two to the operators lays
- in effect fishing may take place for a tide or two and then there will be days in between with no fishing.

Mediterranean gull, lesser black-backed gull, herring gull are present on both the intertidal and open water and therefore there is potential for visual disturbance from access and fishing to the authorised area. Visual disturbance to gulls will be minimal and any displacement temporary and short lived for the following reasons:

- gulls could be feeding on the mussel beds over low water
- fishing by hand-gatherers can only occur for one to two hours over low water when the beds are uncovered on the larger spring tides
- the gatherers will only travel once to and from the fishing area per tide
- the authorised area is small with an estimated area of 4.75ha
- fishing is never 100% efficient and neither method will remove all of the mussel from the bed
- there will be a limited number of hand-gatherers prosecuting the fishery with a maximum of 30 permit holders fishing over low water. While they fish South America they will not be fishing other beds
- very low levels of hand-gathering occurs on Foulney, Low Bottom and near the Walney Channel where an abundant stock of varying sizes of mussel provides alternative resource for the birds on more tides (higher on the beach in many places). Average numbers fishing are 6-8 permit holders
- a seed mussel fishery has been authorised on Heysham Flat from 3<sup>rd</sup> August 2020, where an abundant stock is present, with larger mussel on the lower skears. To date no activity has taken place partly due to cockle fisheries in other parts of the UK being open, and size mussel gathering on Foulney
- the dredge vessels will fish over high water on more neapy tides - ie. at times when the birds will be resting or feeding on inshore / inland sites.

Sandwich tern, common tern, and little tern rarely use the intertidal area at low water but will use the shallow areas covered by water. The tern species do nest in coastal areas but none of the known nest areas are access points for the fishery. The known nesting areas for terns in the European Site are Foulney and Hodbarrow. There is potential for fishing activity to disturb the terns while fishing in shallow water at low tide but terns have large foraging ranges and will not be displaced a large distance by the fishing activity. The main times of year when they are present are now passed.

***The NWIFCA is confident that visual disturbance to the SPA features will have no risk of adverse effect on the integrity or conservation status of the site.***

**7. Management and Mitigation to Ensure No Adverse Effect on the Integrity of the European Site:**

In order for the NWIFCA to be fully confident of no risk of adverse effect on the integrity or conservation status of the sites a precautionary approach is being taken, and the following management measures implemented:

- a) Rigorous enforcement of the conditions set out in the authorisation and permit conditions;
- b) Monitored landings through:
  - i. Regular IFCO reporting of numbers fishing and estimates of quantities removed;
  - ii. Landings returns from Byelaw 3 permit holders and Dredge permit holders (required under both byelaws);
- c) Monitoring and inspection to ensure that there are no litter issues;
- d) NWIFCA enforcement officers will use intelligence and contacts with fellow enforcement agencies to pursue any suspicions of non-permitted or illegal gathering activity;
- e) one month post start of fishery NWIFCA science and enforcement inspection and reporting of the area.

**Table 2: Summary of Impacts**

Feature/Sub feature(s)	Conservation Objective	Potential pressure <sup>4</sup> (such as abrasion, disturbance) exerted by gear type(s) <sup>5</sup>	Potential ecological impacts of pressure exerted by the activity/activities on the feature <sup>6</sup> (reference to conservation objectives)	Level of exposure <sup>7</sup> of feature to pressure	Mitigation measures <sup>8</sup>
Intertidal mixed sediments, intertidal coarse sediment	Maintain or restore the extent, distribution structure or function of the feature.	Abrasion/disturbance of the substrate on the surface of the seabed	Both hand-gathering and seed mussel dredge fishing remove the mussel from the surface of the seabed and there is potential for abrasion / disturbance / penetration of the substrate on and below the seabed from the use of rakes and dredges.	As in 6.1.2(i) + (ii)	None - current management measures sufficient with monitoring of the fishery
Intertidal biogenic reef: including mussel and Sabellaria alveolata communities		Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion	Litter could pose potential threat to wildlife, especially birds through ingestion or entanglement	As in 6.1.2 (iii)	None - current management measures sufficient with monitoring of the fishery
		Litter	The mussel has settled on hard substrate of cobble and boulder skear. There is potential for removal of pebbles and cobbles from the fishery particularly from poorly worked dredges, and hence a change to the seabed type.	As in 6.1.2(iv)	None - current management measures sufficient with monitoring of the fishery
		Physical change (to another seabed type)	Potential to affect the:- - Presence and spatial distribution of the feature communities - Presence and abundance of typical species - The species composition of component communities	As in 6.1.2 (v)	None - current management measures sufficient with monitoring of the fishery
<ul style="list-style-type: none"> <li>- <i>Somateria mollissima</i>; Common eider</li> <li>- <i>Haematopus ostralegus</i>; Eurasian oystercatcher</li> <li>- <i>Calidris canutus</i>; Red knot</li> </ul>	Maintain or restore the population of each of the qualifying features, and, the distribution of the qualifying features within the site	Removal of target species (mussels)	Potential to affect the:- - Food availability - Condition and survival of SPA species - Abundance of SPA species	As in 6.2.2 (i)	None - current management measures sufficient with monitoring of the fishery

<sup>4</sup> Guidance and advice from NE.

<sup>5</sup> Group gear types where applicable and assess individually if more in depth assessment required.

<sup>6</sup> Document the sensitivity of the feature to that pressure (where available), including a site specific consideration of factors that will influence sensitivity.

<sup>7</sup> Evidence based e.g. activity evidenced and footprint quantified if possible, including current management measures that reduce/remove the feature's exposure to the activity.

<sup>8</sup> Detail how this reduces/removes the potential pressure/impact(s) on the feature e.g. spatial/temporal/effort restrictions that would be introduced.

· *Larus argentatus*; Herring gull

- Common eider
- Eurasian oystercatcher
- Red knot
- Little egret
- Whooper swan
- Pink-footed goose
- Common shelduck
- Wigeon
- Northern pintail
- Common eider
- Goldeneye
- Red-breasted Merganser
- Eurasian oystercatcher
- Ringed plover
- European golden plover
- Grey plover
- Lapwing
- Red knot
- Sanderling
- Dunlin
- Ruff
- Black-tailed godwit
- Bar-tailed godwit
- Eurasian curlew
- Common redshank
- Ruddy turnstone
- Mediterranean gull
- Cormorant
- Great crested grebe
- Seabird assemblage
- Waterbird assemblage
- Lesser black-backed gull
- Herring gull
- Sandwich tern
- Common tern
- Little tern

Maintain or restore the population of each of the qualifying features, and, the distribution of the qualifying features within the site

Visual disturbance

Potential to affect the:-

- Condition and survival of SPA species
- Abundance of SPA species
- Extent and distribution of supporting habitat available whilst a fishing activity is occurring

As in 6.2.2(ii)

None - current management measures sufficient with monitoring of the fishery

## 7. Conclusion<sup>9</sup>

The authorisation, permit, management and mitigation measures incorporated into this fishery, the use of an effective enforcement team of NWIFCA Officers with multi-agency support, the highly dynamic environment in which the fishery lies, and the recorded history of the resources in this area, allows the NWIFCA to conclude that the undersize mussel hand-gathered and dredge fishery at South America 2020 will not have an adverse effect on the integrity of the European Site.

## 8. In-combination assessment<sup>14</sup>

### 8.1 Other ongoing and Authorised Fisheries to be Included in the In-combination assessment:

Tractor shrimp fishery – it is possible that some operators could go shrimp fishing in close proximity with the mussel fishery.

Size mussel fisheries – there is an active hand-gathered size mussel fishery in Foulney.

Undersize mussel hand-gathered fishery at Heysham Flat - this fishery was authorised on 3rd August 2020.

Size cockle fishery - due to open on 1<sup>st</sup> September to Byelaw 3 permit holders - 4 beds in the Bay.

#### 8.1.2 In Combination Assessment

Low water intertidal fisheries:

The shrimp fishery has undergone an HRA which concluded no adverse effect on the integrity of the European Site. Most of the shrimp fishing occurs between spring and autumn with autumn being the key time. Most of the shrimp tractor fishers in Morecambe Bay are also NWIFCA Byelaw 3 permit holders. Most of them prosecute a range of fisheries and it is most likely that they will fish size mussels at Foulney or possibly the undersize mussel at South America which will result in reduced shrimp fishing, and move on to the cockles on 1<sup>st</sup> September.

The size mussel fishery is open throughout the District all year round for Byelaw 3 permit holders. Each fishery is rigorously monitored and enforced by warranted IFCOs. In reality each fishery is only prosecuted by low numbers and modest amounts of mussel removed. For example in the first four months of 2020 landings reports for the north Morecambe Bay mussel beds, which include Low Bottom, Foulney Ditch, Walney Channel, Foulney and Foulney Island, came to 205.3 tonnes. Biomass estimates made from Dutch Wand survey data in May came to 1623 tonnes for Walney Channel and 6771 tonnes for Foulney and Foulney Island, illustrating what a low level and sustainable fishery it is. These are the same gatherers who will prosecute the undersize mussel if they chose and therefore in relative terms of resource removed and disturbance risk there is no effect.

Likewise with the undersize mussel fishery authorised at Heysham Flat which has undergone a separate HRA. This bed has been assessed numerous times over the past twenty years for mussel biomass when the skear is densely covered with average estimates around 6000 tonnes. When considering that a maximum of 800 tonnes is removed by permit holders when 40 are fishing most tides it again shows the modest impact of the fisheries. Again these are the same stakeholders and will either fish one or the other on each day and therefore when taken in combination have negligible effect.

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<sup>9</sup> If conclusion of adverse effect alone an in-combination assessment is not required.

During the first ten days of the fishery there will be no gathering of cockles in Morecambe Bay as all cockle beds are under the seasonal closure until 1<sup>st</sup> September. Cockle fisheries are separately assessed. Once these fisheries open it will divert effort from mussels. The overall effect in combination can therefore be negated.

Considering cockle, size mussel and shrimp fisheries in the Bay in combination with intertidal hand-gathering of seed mussel the NWIFCA can conclude no adverse effect on the integrity of the European Site providing the management measures of the authorised mussel fishery are implemented and enforced.

High water dredge fishery:

The area of the fishery is of such a minimal size and only two vessels are likely to prosecute it. The resource would be lost to natural causes if not fished. Dredging occurs over different tides to hand-gathering and tractor shrimping.

Considering cockle, size mussel and shrimp fisheries in the Bay in combination with dredge harvest of seed mussel the NWIFCA can conclude no adverse effect on the integrity of the European Site providing the management measures of the authorised mussel fishery are implemented and enforced.

## **9. Summary of consultation with Natural England**

Natural England were involved in discussions around the management of the fishery pre-TSB approval. Their input was integral to management decisions and their advice is provided below.

## **10. Integrity test**

The NWIFCA concludes no adverse effect on the integrity of the European Site providing the management and mitigation measures of the South America undersize mussel fishery 2020 are implemented and upheld.

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## Annex 2: Natural England's consultation advice

Date: 15 August 2020  
Our ref: 325524  
Your ref: Undersize Mussel South America Hand gathering And Dredge Fishery



North Western Inshore Fisheries and Conservation Authority (NWIFCA)  
Preston Street  
Camforth  
Lancashire  
LA5 9BY

Hornbeam House  
Crewe Business  
Park Electra  
Way Crewe  
Cheshire CW1  
6GJ

BY EMAIL ONLY

T 0300 060 3900

Dear Mandy Knott and Jon Haines,

### **NWIFCA Undersize Mussel South America Handgathering And Dredge Fishery August 2020 Morecambe Bay and Duddon Estuary**

Thank you for your consultation dated 12 August 2020 and the updated HRA received on 12 August 2020. The following constitutes Natural England's formal statutory response.

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.

#### **THE CONSERVATION OF HABITATS AND SPECIES REGULATIONS 2010 (AS AMENDED)**

The application site is within a European designated site (also commonly referred to as Natura 2000 sites), and therefore has the potential to affect its interest features. European sites are afforded protection under the Conservation of Habitats and Species Regulations 2010, as amended (the 'Habitats Regulations'). The application site is within the Morecambe Bay Special Protection Area (SPA), Morecambe Bay and Duddon Estuary SPA (SPA) and the Morecambe Bay Special Area of Conservation (SAC) which are European sites. The site is also listed as Morecambe Bay Ramsar site<sup>2</sup> and also notified at a national level as Morecambe Bay Site of Special Scientific Interest (SSSI). Please see the subsequent sections of this letter for our advice relating to SSSI features.

In considering the European site interest, Natural England advises that you, as a competent authority under the provisions of the Habitats Regulations, should have regard for any potential impacts that a plan or project may have<sup>2</sup>.

<sup>1</sup>Listed or proposed Wetlands of International Importance under the Ramsar Convention (Ramsar) sites are protected as matter of Government policy. Paragraph 118 of the National Planning Policy Framework applies the same protection measures as those in place for European sites.

<sup>2</sup>Requirements are set out within Regulations 61 and 62 of the Habitats Regulations, where a series of steps and tests are followed for plans or projects that could potentially affect a European site. The steps and tests set out within Regulations 61 and 62 are commonly referred to as the 'Habitats Regulations Assessment' process.

**No objection**

Natural England notes that your authority, as competent authority under the provisions of the Habitats Regulations, has undertaken an Appropriate Assessment of the proposal, in accordance with Regulation 61 of the Regulations. Natural England is a statutory consultee on the Appropriate Assessment stage of the Habitats Regulations Assessment process.

Your appropriate assessment concludes that your authority is able to ascertain that the proposal will not result in adverse effects on the integrity of any of the sites in question. Having considered the assessment, and the measures proposed to mitigate for all identified adverse effects that could potentially occur as a result of the proposal, Natural England advises that we concur with the assessment conclusions, providing that all mitigation measures are appropriately secured in any permission given.

**WILDLIFE AND COUNTRYSIDE ACT 1981 (AS AMENDED)****No objection – no conditions requested**

This application is within Morecambe Bay Site of Special Scientific Interest (SSSI). Natural England is satisfied that the proposed development being carried out in strict accordance with the details of the application, as submitted, will not damage or destroy the interest features for which the site has been notified. We therefore advise your authority that this SSSI does not represent a constraint in determining this application. Should the details of this application change, Natural England draws your attention to Section 28(1) of the *Wildlife and Countryside Act 1981* (as amended), requiring your authority to re-consult Natural England.

Yours sincerely,

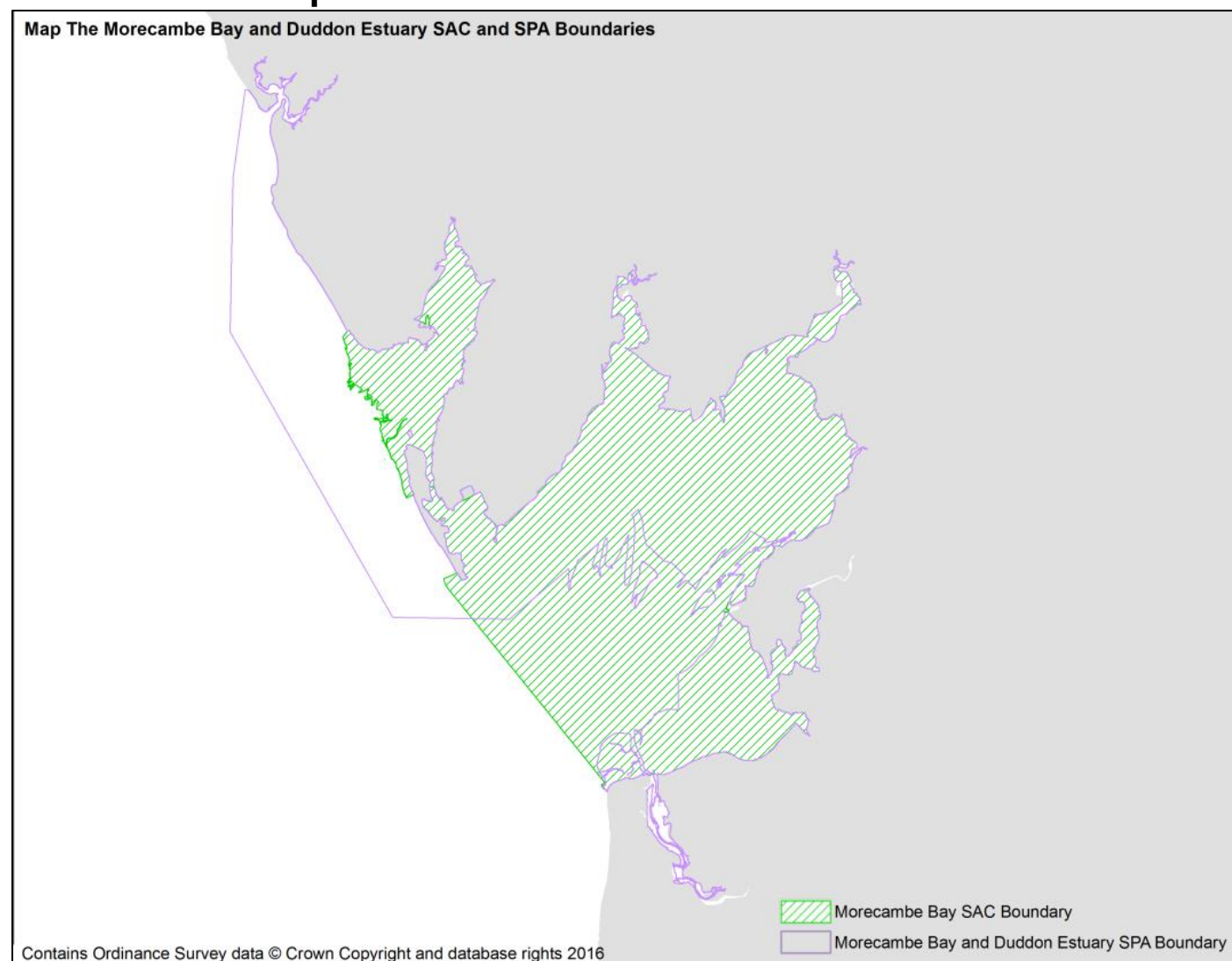


Rosie Horner  
Cheshire to Lancashire Area Team  
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Telephone: 07887290872

<sup>1</sup>Listed or proposed Wetlands of International Importance under the Ramsar Convention (Ramsar) sites are protected as matter of Government policy. Paragraph 118 of the National Planning Policy Framework applies the same protection measures as those in place for European sites.

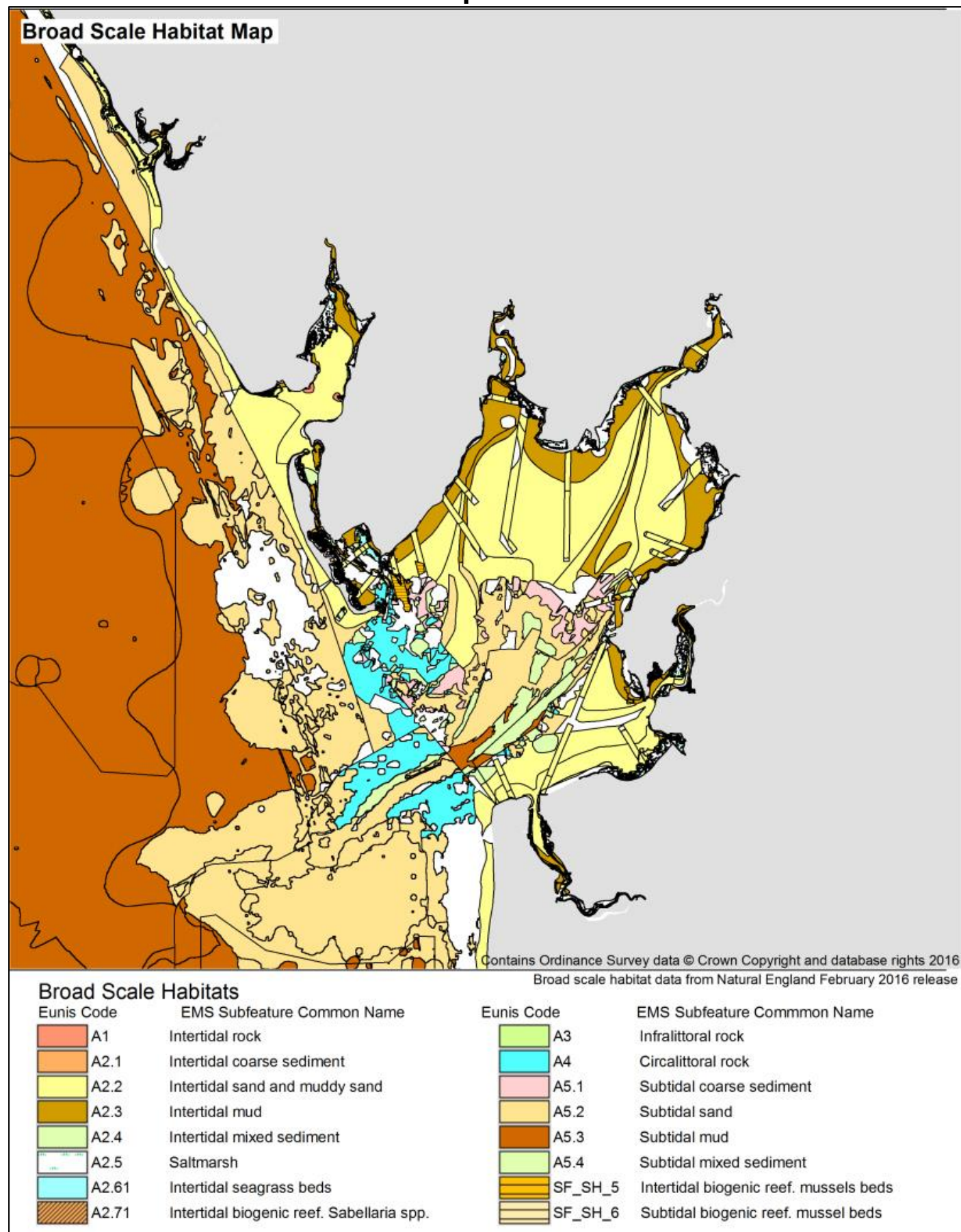
<sup>2</sup>Requirements are set out within Regulations 61 and 62 of the Habitats Regulations, where a series of steps and tests are followed for plans or projects that could potentially affect a European site. The steps and tests set out within Regulations 61 and 62 are commonly referred to as the 'Habitats Regulations Assessment' process.

## Annex 3: Site Map





## Annex 4: Broad Scale Habitat Map





**AUTHORISATION TO FISH UNDERSIZED MUSSELS FROM  
SOUTH AMERICA 2020**

**All Current NWIFCA Byelaw 3 Permit Holders**

**DATE TBC**

**With effect from: 20/08/2020**

**Expiry Date: 18/09/2020**

All current Byelaw 3 permit holders are hereby authorised, under Byelaw 3, paragraph 6 (Minimum Sizes) to fish undersized mussels from South America, in the **permitted fishing and transiting area as defined in paragraph 2 and illustrated in Annex A**, and are responsible for complying with the conditions given below at paragraph 1.

**1. Conditions of Authorisation**

This authorisation is issued subject to the following conditions.

- (a) It is only valid for the period from **20/08/2020** to **18/09/2020**.
- (b) That fishing for seed mussel is only authorised west of the line B-C as defined in para. 2 and illustrated in Annex A.
- (c) That the mussels shall only be gathered by hand or with a rake.
- (d) The NWIFCA will close the fishery during periods of prolonged cold weather.
- (e) The authorisation is only valid for current Byelaw 3 permit holders. It does not allow any other person to take or remove undersized mussels.
- (f) This authorisation does not exonerate the holder from other sea fisheries legislation, nor does it prejudice any other consents the holder may need to obtain nor does it override or provide permission to go over private land.
- (g) Any fishing taking place under this authorisation shall be carried out in accordance with the Authority's Code of Conduct for Intertidal Shellfisheries.

## 2. Definition of Permitted Fishing Area

Part of that area within Morecambe Bay known as South America as illustrated on the map attached at Annex A, and bound by the following co-ordinates only:

Point	Lat (d.d)	Lon (d.d)	Lat (d m.m)	Lat (d m.m)
A	54.04695	-3.11809	54° 2.817'N	003° 7.085' W
B	54.04500	-3.10999	54° 2.700'N	003° 6.599' W
C	54.05898	-3.10160	54° 3.538'N	003° 6.095' W
D	54.06097	-3.10985	54° 3.658'N	003° 6.590' W

## 3. Advisory Notes

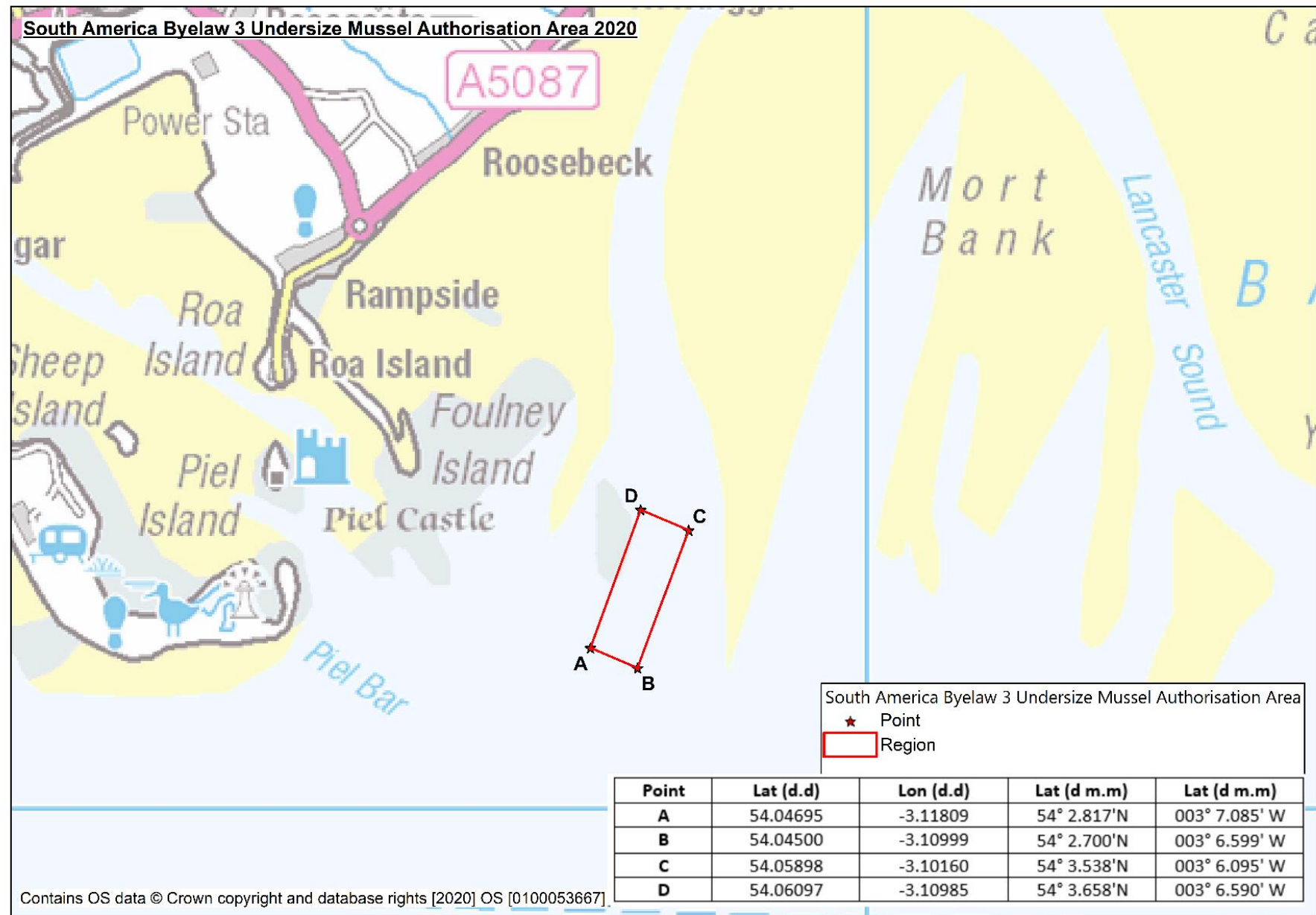
- (a) NWIFCA officers have the power to withdraw authorisations at any point should the need arise, and will consult with Natural England throughout the duration of the fishery. Should there be concerns that losses of mussel around Morecambe Bay is occurring which will impact on the available bird feeding resource, the NWIFCA will withdraw authorisations and close the fishery.
- (b) Avoid driving vehicles over the seed mussels as far as possible. Using a single access route will avoid unnecessary damage to the mussel stock.

This authorisation may be revoked by the NWIFCA at any time and any breach of the terms or conditions of this authorisation shall make it null and void.

By Order of the Authority

STEPHEN ATKINS  
Chief Executive

# Annex A - South America Seed Mussel 2020 - authorised area for hand-gathering





## Annex 5b – NWIFCA South America Undersize Mussel Dredge Permit 2020



### NORTH WESTERN INSHORE FISHERIES AND CONSERVATION AUTHORITY

**[www.nw-ifca.gov.uk](http://www.nw-ifca.gov.uk)**

Chief Executive: STEPHEN ATKINS, PhD  
1 PRESTON STREET  
CARNFORTH  
LANCASHIRE, LA5 9BY  
Tel: (01524) 727970

**[office@nw-ifca.gov.uk](mailto:office@nw-ifca.gov.uk)**

6 DUNCAN SQUARE  
WHITEHAVEN  
CUMBRIA, CA28 7LN

Person Name

Company Name

Address

Date:

**Permit Number:**

**Vessel Name:**

**Vessel PLN:**

**Issue Date:**

**Start Date**

**24<sup>th</sup> August 2020**

**Expiry Date: 18<sup>th</sup> September 2020**

**Skipper(s):**

The VESSEL NAME is hereby authorised to dredge for MUSSEL in accordance with Restrictions on the use of a Dredge Byelaw 2017 from the area or areas defined within the Flexible Permit Conditions below.

#### Permit Conditions

1. The permit is valid within the dates stated above.
2. The permit is non-transferable.
3. The permit must be available for inspection by an IFC officer during a compliance visit to the vessel.
4. The permit remains the property of and must be surrendered to the Authority if no longer required.
5. The permit holder must not obstruct an IFC Officer.
6. Fishing returns must be filed monthly on the enclosed recording form and must be sent to the Authority's officer by the 5<sup>th</sup> day the month following any period of fishing. Nil returns are not required.
7. The vessel specified must have a fully functioning AIS transmitting information including the vessel's identity course and speed at all times when the vessel is not stationary in port.
8. The permit holder must notify the Authority by phone, text or email at least 2 hours prior to the commencement of fishing in conjunction with the permit.
9. The permit holder must notify the Authority of any change in the information provided to obtain a permit during the period when the permit is valid.

## Flexible Permit Conditions

### South America Dredge Mussel Fishery

1. Fishing is permitted between 24<sup>th</sup> August and 18<sup>th</sup> September 2020 on any tide.
2. The **permitted dredge mussel fishing area** is the area bound by the points A - D shown below, and illustrated in the map at Annex A.

Point	Lat (d.d)	Lon (d.d)	Lat (d m.m)	Lat (d m.m)
A	54.04295	-3.10151	54° 2.576'N	003° 6.090' W
B	54.04500	-3.10999	54° 2.700'N	003° 6.599' W
C	54.05898	-3.10160	54° 3.538'N	003° 6.095' W
D	54.05697	-3.09326	54° 3.418'N	003° 5.595' W

3. The vessel must stay east of the line B to C at all times.
4. Fishing by dredge is only permitted for mussels.
5. Only dredges which have been previously approved in writing by the Authority can be used. Only approved 'ecodredge' can be used.

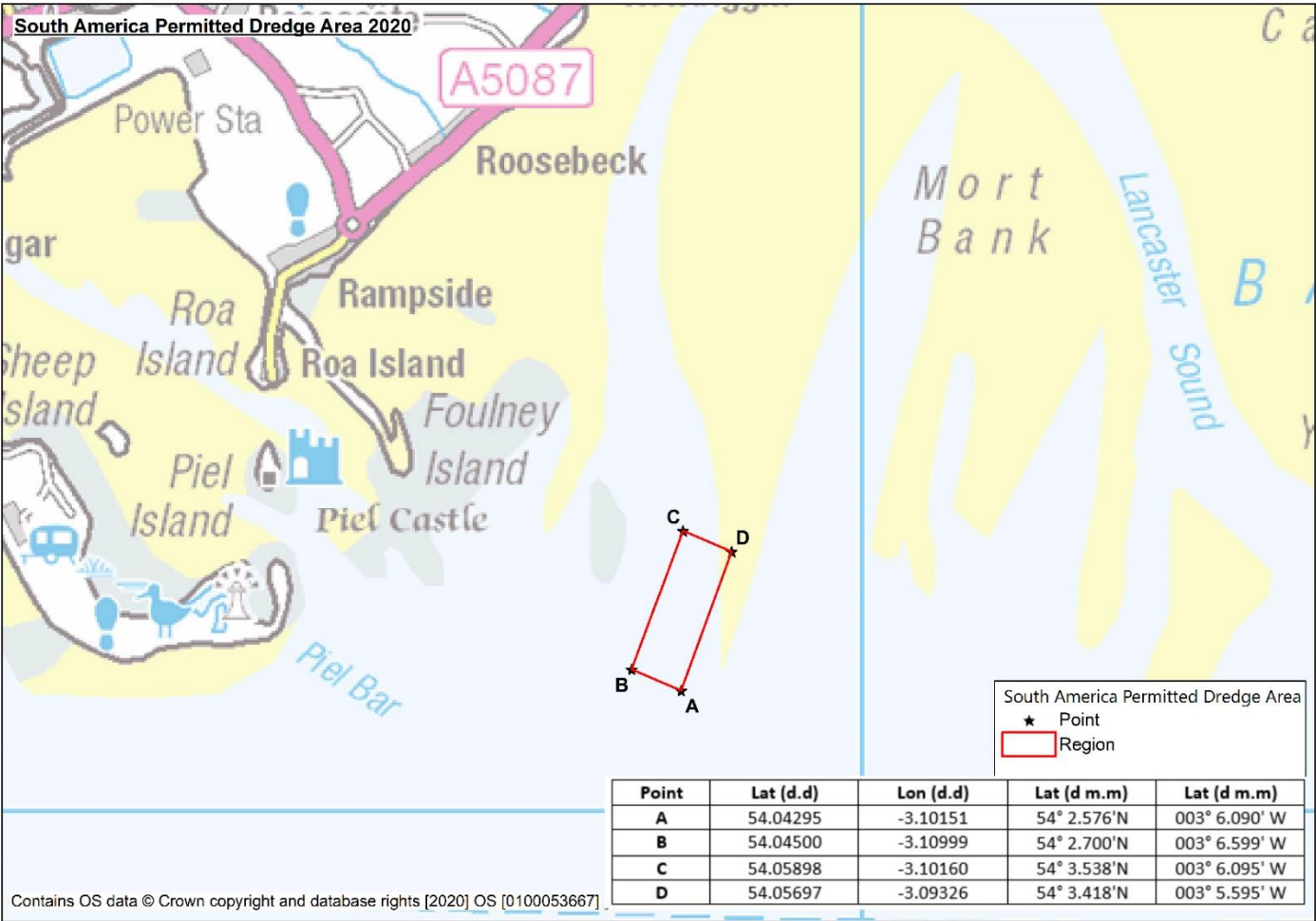
### Advisory Notes

1. This permit does not exonerate the holder from any other sea fisheries legislation.
2. NWIFCA has the power to withdraw flexible permit conditions at any point should the need arise, subject to the review procedure.
3. Any breach of the conditions constitutes a breach of the byelaw.

By Order of the Authority

STEPHEN ATKINS  
Chief Executive

Annex A – South America Permitted Mussel Dredge Area 2020



## Annex 6 – Summary of Mussel and Cockle Beds in Morecambe Bay (NWIFCA July 2020) from industry, inspections and surveys

Date	Location	Skear	Survey Method	Tide Height (m)	Description
14.01.20	Foulney	Foulney	Industry report	1.4	ID had spoken to B3 mussel gatherers. There is some tiny spat settlement on the skear in 'the bay' area. Not known about rest of skear.
27.01.20	Heysham	Heysham Flat	Inspection	1.8	Transects walked across the skear after reported fuel spill. Tide did not ebb past Conger Rock, some areas of 2019 persists mixed in with dead shell. There is a large area of low lying <i>Sabellaria aveolata</i> inshore of Conger Rock from edge of skear to middle of skear.
12.03.20	Heysham	Heysham Flat	Inspection	0.4	Skear down to bare cobble with only the occasional 2019 mussel. Some signs of 2020 spat in low densities. <i>Sabellaria alveolata</i> on north and south of the skear.
13.03.20	North Morecambe Bay	Falklands	Inspection	0.7	Area not accessed, but ground visible and gull activity present. Areas that looked black appeared uncovered in channel between Falklands, Walney and Foulney
13.03.20	North Morecambe Bay	South America	Inspection	0.7	New area has been exposed, 2020 mussel settlement, presents of <i>S. alveolata</i>
14.03.20	Foulney	Foulney	Rapid Visual Assessment (% cover)	1.1	Much of skear covered in mussel. Bottom has been fished but still large mussel around. Good pin prick spat settlement
14.03.20	Foulney	Foulney Island	Rapid Visual Assessment (% cover)	1.1	Whole of island covered in large mussel. Clean and loose. Good meat content/ Spat settled.
8.4.20	North Morecambe Bay	South America	Industry report	0.2	Sporadic seed settlement and an abundance of starfish. Limited area covered.
		Falklands	Industry report	0.2	To the south and west of the Falklands area, two areas of mussel named Trailer Bank and Small Island were visible. Both size mussel and spat settlements present on both, and an abundance of starfish. Mussel were hard in to the substrate and although beginning to build mud in some areas.
6.5.20	Foulney	Foulney	Dutch Wand	0.7	Foulney and Foulney Island surveyed together as the area between has filled with mussel, resulting in an increased area from 2019. Spat has settled across most of the skear in high densities. Sizes of mussel (excluding spat) were between 15-67mm, with although predominantly between 50-60mm in size, and as such over 3/4 of the mussel meets the 45mm MLS, areas that were predominantly undersize were on the higher areas of Foulney Skear. Starfish were observed along the bottom of Foulney Island. Estimates: area = 53.7ha, 6771 tonnes
7.5.20	Foulney	Walney Channel	Dutch Wand	0.5	Walney channel area reduced from 2019. Spat has settled in high densities across the eastern side of the area, no spat observed along the channel edge areas. Mussel (excluding spat) was between 40-68mm, as such the majority of mussel is of size. No starfish were observed. Estimates: area = 18.41ha, 1623 tonnes
7.5.20	North Morecambe Bay	Falklands	Industry report	0.5	Trailer Bank and Small Island areas surveyed. Mussel and spat have grown on and are putting down mussel mud. Starfish are still abundant in large numbers. Cobble areas were observed but were isolated between the larger areas of mussel. Trailer Bank was estimated at 26.53ha and small island at 16.89ha.

8.5.20	North Morecambe Bay	Low Bottom	Inspection	0.5	Dense spat settlement across large area, sizes ranges 4-10mm. The upper reaches of the bed held older barnacled mussel.
9.5.20	Heysham	Heysham Flat	Inspection	0.7	Patchy settlement on the main skear, larger mussel present towards Dallam Dyke, some areas of bare cobble present. Knott End skear held denser mussel settlement and a significant amount of size mussel. <i>Sabellaria alveolata</i> colonies present away from main skear.
4.6.20	Duddon Estuary	Hardacre	Inspection	1.1	No mussel present, substrate mainly sandy with dead mussel shell, area of bare cobble visible at low water.
4.6.20	Fleetwood	Black Scar	Inspection	1.1	Dense spat settlement 8-10mm in size, approximately 90% coverage on hard substrate. Small areas of 2019 mussel mixed in with spat.
4.6.20	Fleetwood	Perch Scar	Inspection	1.1	Dense spat settlement 8-10mm in size, approximately 60-70% coverage on hard substrate. Small areas of 2019 mussel mixed in with spat.
4.6.20	Fleetwood	Kings Scar	Inspection	1.1	Patchy spat settlement that had grown on to 5-15mm in size mixed in with 20-40mm mussel. Areas of bare cobble and <i>Sabellaria alveolata</i> , although the latter was covered in spat.
4.6.20	Fleetwood	Rossall skear	Inspection	1.1	50% coverage of spat settlement with 20-30mm 2019 mussel.
7.6.20	North Morecambe Bay	South America	Inspection	1	Seed mussel settlement surveyed previously has grown on to 10mm. Mussel is on muddy sandy substrate with no bare areas. Cobble area present to the north where there is no mussel. Some patches of <i>Sabellaria alveolata</i> that are covered in mussel.
8.6.20	Knott End	Wyre End	Inspection	1.1	Seed mussel settlement present across much of the main skear and a smaller channel edge area. Northern third of the main skear received no settlement. Larger mussel present across both areas with sizes ranging from 20-45mm, mussel and spat coverage ranged from 50-80%. Bare cobble area present on raised area of main skear, remnant <i>Sabellaria alveolata</i> deteriorated and covered in spat.
9.6.20	Heysham	Heysham Flat	Inspection	1.4	Further settlement of spat since last survey in May although still bands of bare cobble present. Some areas with 2019 mussel mixed with spat. <i>Sabellaria alveolata</i> on the main skear has been settled on by spat.
03.07.20	Heysham	Heysham Flat	Inspection	1.7	Much of upper skear with dense mussel covering of increasing sizes as you go down skear. Gales and tide didn't ebb off much beyond Conger Rock. <i>Sabellaria alveolata</i> on upper skear looking healthy and relatively free of mussel cover.

<b>Cockle Bed</b>	<b>Date of Survey</b>	<b>Area (ha)</b>	<b>Size Cockle (tonnes)<sup>1</sup></b>	<b>Undersize Cockle (tonnes)<sup>2</sup></b>
<b>Warton Sands Main Area</b>	<b>23<sup>rd</sup> June 2020</b>	<b>271.2</b>	<b>175</b>	<b>~115</b>
<b>Warton Sands Dense Area</b>		<b>14.6</b>	<b>105</b>	<b>~790</b>
<b>Aldingham and Newbiggin</b>	<b>9<sup>th</sup> July 2020</b>	<b>1351</b>	<b>~3200</b>	<b>~770</b>
<b>Pilling Sands</b>	<b>7<sup>th</sup> July 2020</b>	<b>1576</b>	<b>~2400</b>	<b>~900</b>
<b>Middleton Sands</b>	<b>8<sup>th</sup> July 2020</b>	<b>615</b>	<b>~300</b>	<b>~200</b>
<b>Flookburgh</b>	<b>22<sup>nd</sup> July 2020</b>	<b>2398</b>	<b>~3300</b>	<b>~500</b>
<b>Leven Sands</b>	<b>23<sup>rd</sup> July 2020</b>	<b>1859</b>	<b>~3100</b>	<b>~700</b>

## Annex 7: Byelaws regulating cockle and mussel hand-gathering in Morecambe Bay

### NWIFCA BYELAW 3 - PERMIT TO FISH FOR COCKLES (*Cerastoderma edule*) AND MUSSELS (*Mytilus edulis*)

#### Interpretation

1. In this byelaw:
  - a. “cockles” means the species *Cerastoderma edule*;
  - b. “mussels” means the species *Mytilus edulis*;
  - c. “fishery” means an area of sea, seabed, exposed estuary, seashore, or other marine environment in any part of the District;
  - d. “the NWIFCA” means the North Western Inshore Fisheries and Conservation Authority and is defined in articles 2 and 4 of the North Western Inshore Fisheries and Conservation Order 2010 (S.I. 2010 No. 2200);
  - e. “the District” means North Western Inshore Fisheries and Conservation District and is defined in articles 3 and 4 of the North Western Inshore Fisheries and Conservation Order 2010 (S.I. 2010 No. 2200);
  - f. “full gathering permit” means a permit which authorises a person to gather cockles and mussels and carry out all related activities, such as moving them and transporting them;
  - g. “support worker permit” means a permit which authorises a person to carry out activities related to the gathering of cockles and mussels, such as moving them and transporting them to support a person with a full gathering permit but only after the cockles and mussels have been placed in a receptacle, and in the case of cockles after having been passed through a riddle, by person with the full gathering permit;
  - h. “gathering” includes all activities related to the gathering of cockles and mussels such as moving and transporting them;
  - i. “Commercial Shellfish Fisheries Area” means an area designated by the NWIFCA pursuant to paragraph 13;
  - j. “Morecambe Bay Commercial Fisheries Area” means the area enclosed by straight lines joining the following co-ordinates in order:
    - I. 54° 08.490'N 03° 02.011'W
    - II. 54° 07.686'N 02° 53.497'W
    - III. 54° 03.204'N 02° 56.331'W
    - IV. 54° 04.062'N 03° 03.776'W
    - V. 54° 08.490'N 03° 02.011'W
  - k. “Ribble Estuary Commercial Fisheries Area” means the area enclosed by straight lines joining the following co-ordinates in order:
    - I. 53° 43.008'N 03° 05.177'W
    - II. 53° 43.572'N 02° 59.986'W
    - III. 53° 40.902'N 03° 00.341'W
    - IV. 53° 40.860'N 03° 05.122'W
    - V. 53° 43.008'N 03° 05.177'W
  - l. “Gangmaster Licensing Authority licence” means a licence issued under the Gangmasters Licencing) Act 2004;
  - m. “Foreshore Gatherers Safety Training Certificate” means a document issued by a Seafish Industry Group Training Association or a trainer approved by the NWIFCA, certifying that the person named on the certificate has completed a safety training course for intertidal shellfishing.

#### Permit

2. Subject to paragraphs 10, 11, 25 and 26 of this byelaw no person shall gather cockles or mussels within or from a fishery unless he has in his possession a full gathering permit.
3. Subject to paragraphs 10, 11, 25 and 26 of this byelaw, no person shall, in the area of the District below mean high water springs, move or transport cockles or mussels within or from a fishery unless he has either a full gathering permit or a support worker permit.
4. No person shall have in their possession any article for use in the course of or in connection with gathering cockles or mussels within or from a fishery in breach of this byelaw.
5. No person shall have in their possession any cockle or mussel gathered within or from a fishery in breach of this byelaw.

#### **Minimum Sizes**

6. No person shall gather within or from a fishery any cockle which will pass through a gauge having a square opening of 20mm measured across each side of the square or any mussel less than 45mm in length.

#### **Fishing Methods**

7. No person shall gather cockles or mussels except:
  - a) by hand or using hand-held rakes;
  - b) in the case of cockles by using craams, rakes, spades, tamps or jumbos; or
  - c) by using buckets, sacks, net bags, ton bags and other such containers ordinarily used for the storage of cockles and mussels.
8. No person shall place cockles that have just been fished into a container unless they have been passed through a rigid riddle designed to retain cockles which will not pass through a gauge having a square opening of 20mm measured across each side.

#### **Redeposit**

9. Any person who removes or possesses shellfish the removal or possession of which is prohibited by or in pursuance of these byelaws or any Act of Parliament shall immediately redeposit the same without injury as nearly as possible in the fishery from which they were taken or under the written authority of the NWIFCA on another suitable fishery and shall spread them thinly and evenly through the fishery.

#### **Written permission**

10. This byelaw shall not apply to any person performing an act which would otherwise constitute an offence against this byelaw if that act was carried out in accordance with a written permission issued by the NWIFCA permitting that act for scientific, management, stocking or breeding purposes.

#### **Exception for Personal Consumption to the Requirement for a permit**

11. No person shall require a permit under this byelaw to gather less than a total of 5kg of cockles and 5kg of mussels during a calendar day intended for their own personal consumption within or from a fishery which is neither closed pursuant to paragraph 12 of this byelaw or byelaw 13A of the North Western and North Wales Sea Fisheries Committee (cockles and mussels – management of the fishery) or byelaw 18 of the Cumbria Sea Fisheries Committee (shellfishery – temporary closure) nor designated a Commercial Shellfish Fishery Area pursuant to paragraph 13 of this byelaw nor part of the District managed under the Dee Estuary Cockle Fishery Order (2008).

#### **Fisheries Closure**

12. No person shall gather any cockle within or from a fishery on or between the 1<sup>st</sup> day of May and the 31<sup>st</sup> day of August in the same year or have in their possession any cockle or mussel from a fishery area that has been closed pursuant to byelaw 13A of the North Western and North Wales Sea Fisheries Committee (cockles and mussels – management of the fishery) or byelaw 18 of the Cumbria Sea Fisheries Committee (shellfishery – temporary closure) or from within that part of the District managed under the Dee Estuary Cockle Fishery Order (2008) without a licence to fish issued within the terms of that Order.



## **Commercial cockle or mussel fisheries**

13. The NWIFCA designates the Morecambe Bay Commercial Fisheries Area and the Ribble Estuary Commercial Fisheries Area as Commercial Shellfish Fisheries Areas.

### **Application for Permits**

14. The period of validity of permits shall be from 1<sup>st</sup> September in any given year to 31<sup>st</sup> of August the following year unless otherwise stated. Permits shall be annually renewable subject to paragraph 15 of this byelaw. A fee of £500 will be charged each year by the NWIFCA for all Byelaw 3 permits.
15. Holders of a permit to gather cockles or mussels under this byelaw in any given year shall be entitled to renew the permit for the next year up to one year after the permit term has expired.
16. Applications for the renewal of permits pursuant to this byelaw shall be made using the printed forms available from the NWIFCA offices or the NWIFCA website. Renewal forms will be made available 2 calendar months before the date each permit term begins. On renewal, applicants must satisfy the NWIFCA that at some time in the previous 3 years they have derived a substantial part of their income from fishing activities by providing evidence which may include a personal statement detailing fishing activities in the last 3 years and evidence that tax has been paid on fishing income in the last 3 years.
17. Applications for new permits pursuant to this byelaw shall be made using the printed forms available from the NWIFCA offices or the NWIFCA website. Applications for new permits to be issued pursuant to paragraphs 22 and 27 of this byelaw shall be made by first registering an interest with the NWIFCA in writing. If the number of applicants registering an interest exceeds the number of available permits a waiting list will be compiled on a 'first come, first served' basis and an applicant will be invited to complete an application for a new permit in the first year a new permit becomes available. Applications shall meet all the requirements of paragraph 22 in the case of full gathering permits and paragraph 27 in the case of support worker permits.
18. A permit issued pursuant to this byelaw is not transferable.
19. Failure to produce, on the reasonable demand of a properly warranted Officer or a Constable, a valid permit when carrying out any activity for which a permit is required constitutes a breach of this byelaw.
20. Failure to notify the NWIFCA of any change of name or address during the period of the validity of a permit constitutes a breach of this byelaw.

### **Filing returns**

21. The holder of a permit to gather cockles or mussels under this byelaw shall be required to file with the NWIFCA, no later than the 5<sup>th</sup> day of the month following, such information in regard to catches and fishing effort for the previous month, under the terms of such permit, as the NWIFCA may require. Nil returns may be required at the discretion of the NWIFCA. Permit holders not filing returns may have their permits suspended by the NWIFCA until returns have been filed.

### **New Permits**

22. New full gathering permits shall be issued each year to a maximum of the first 10 applicants on the waiting list who have not held a permit pursuant to this byelaw in the previous year on production of :
  1. evidence of the applicant's identity, containing photograph and signature, such as a valid passport; or a driving licence with photo;
  2. evidence of the applicant's address, such as a utility bill issued in the preceding 4 months of application or a current tenancy agreement;
  3. evidence of the applicant's National Insurance Number;
  4. 2 recent passport style photographs of the applicant signed on the back by the applicant;
  5. the applicant's valid Foreshore Gatherers Safety Training certificate or proof of the successful completion of an equivalent safety training course. Equivalence is determined at the discretion of the NWIFCA; and
  6. payment of the fee set in paragraph 14.

## Transitional Arrangements

23. Holders of a permit for 2011/2012 issued under byelaw 5 of the NWIFCA (permit to fish for cockles (*Cerastoderma edule*) and mussels (*Mytilus edulis*)) shall be entitled to renewal of that permit under this byelaw 3 for the year 2012/2013.
24. Permits to fish for cockles and mussels for the year 2012/2013 shall be issued to 40 new applicants under the rules set out in Byelaw 5 of the NWIFCA (permit to fish for cockles (*Cerastoderma edule*) and mussels (*Mytilus edulis*)). No permits to fish for cockles and mussels shall be issued to new applicants under this byelaw 3 for the year 2012/2013.
25. Persons who provide evidence to the satisfaction of the NWIFCA that they have in the past held a permit issued under Cumbria Sea Fisheries Committee byelaw 21 (cockles – permit scheme) or 23 (mussels – permit scheme) and have in the past been engaged in commercial cockle or mussel fishing activities in a specified region or regions within the district formerly administered by the Cumbria Sea Fisheries Committee shall be eligible to apply to the NWIFCA for written authority to continue to fish in any fisheries within that region or regions. The obligations in this byelaw apply to a person fishing under a written authority but no fee is payable for the issue of that authority.
26. Persons who provide evidence to the satisfaction of the NWIFCA that they have in the past been engaged in commercial cockle or mussel fishing activities in a specified region or regions within the Dee Estuary shall be eligible to apply to the NWIFCA for written authority to continue to fish in any fisheries within that region or regions. The obligations in this byelaw apply to a person fishing under a written authority but no fee is payable for the issue of that authority.

## Support worker permit

27. Commercial organisations trading in cockles and mussels may apply to the NWIFCA for permits for specified members of staff who they wish to perform ancillary trading activities within a cockle or mussel fishery which would constitute taking, removing or transporting cockles or mussels within or from a fishery including driving transport vehicles, transporting shellfish, weighing shellfish. The NWIFCA may issue up to a maximum of 6 support worker permits to each commercial organisation upon receipt of complete applications on production of:
  - The names, contact details, national insurance numbers and proof of right to work of the members of staff. Proof of identity of those members of staff containing photograph and signature, such as a valid passport; or a driving licence with photo and proof of address of those members of staff, such as a recent utility bill;
  - Proof from the annual account or annual report of the organisation's trade in cockles or mussels;
  - Evidence that the organisation holds a Gangmaster Licensing Authority licence for shellfish operations if required;
  - Statement of the duties members of staff will perform in the shellfish fishery;
  - Two recent passport style photographs of the members of staff signed and dated on the back by the members of staff;
  - Valid Foreshore Gatherers Safety Training certificates for each of the members of staff or proof of the successful completion of an equivalent safety training course. Equivalence is decided at the discretion of the NWIFCA; and
  - Payment of the fee set in paragraph 14.

## Use of boats

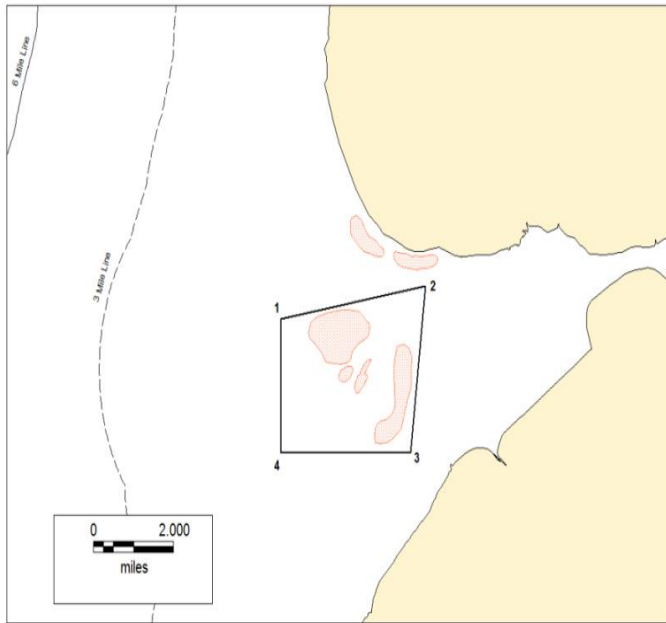
28. No holder of a permit pursuant to this byelaw shall use a boat to access shellfish beds in order to gather, remove or transport cockles or mussels without having their permit endorsed as a boat user by the NWIFCA. The NWIFCA will endorse permits as boat users on production of evidence that the holder has completed training of an equivalent standard to the courses provided by Seafish in: Sea Survival, First Aid, Fire Fighting and Health and Safety Awareness. Equivalence is decided at the discretion of NWIFCA.
29. No person shall be granted an endorsement as a boat user unless they have in their possession a serviceable life jacket and the boat they will use is equipped with a serviceable means of communication such as a VHF radio or mobile telephone, a serviceable means of navigation such as global positioning equipment and serviceable safety provision including marine distress flares and an adequate anchor with a means of effective deployment.

## Revocation of Legacy Byelaws

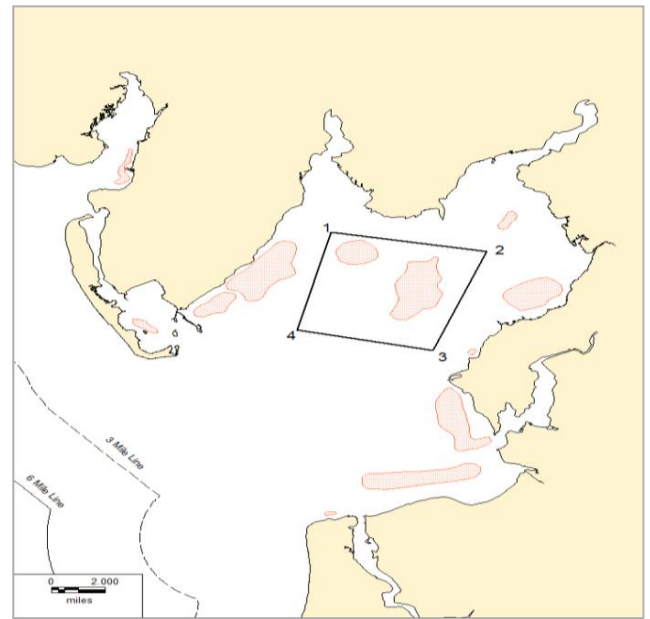
30. Byelaw 5 (permit to fish for cockles (*Cerastoderma edule*) and mussels (*Mytilus edulis*)) made by the NWIFCA is revoked.
31. The following byelaws made by the North Western and North Wales Sea Fisheries Committee are revoked in so far as they apply within the District:
- (a) byelaw 5 (permit to fish for cockles (*Cerastoderma edule*) and mussels (*Mytilus edulis*));
  - (b) byelaw 13 (cockles – minimum size);
  - (c) byelaw 14 (cockle fishery – seasonal closure);
  - (d) byelaw 15 (mussels – minimum size);
  - (e) byelaw 17 (redeposit of shellfish);
32. The following byelaws made by the Cumbria Sea Fisheries Committee are revoked in so far as they apply within the District:
- (a) byelaw 5 (minimum removal size for mussels);
  - (b) byelaw 6 (minimum removal size for cockles);
  - (c) byelaw 12 (re-depositing of shellfish);
  - (d) byelaw 16 (cockles - seasonal closure).
  - (e) byelaw 21 (cockles - permit scheme)
  - (f) byelaw 22 (cockles - catch restrictions)
  - (g) byelaw 23 (mussels - permit scheme)
  - (h) byelaw 24 (mussels – catch restrictions)

### Explanatory Note: (This note does not form part of the byelaw)

1. *The purpose of this byelaw is to control the exploitation of shellfish fisheries of cockles and mussels to ensure catches remain at a sustainable level and are obtained by sustainable fishing methods. As cockle and mussel fishing can be highly lucrative depending on price variations the NWIFCA has concluded a permit scheme is necessary to limit the number of fishermen and consequently the number of cockles gathered, along with the methods they use.*
2. *The byelaw prohibits the gathering of cockles or mussels for sale without a full gathering permit and prohibits the moving and transporting of cockles or mussels for sale below mean high water springs without a support worker permit (paragraphs 2 and 3). The full gathering permit also permits the holder to move and transport cockles or mussels below mean high water springs (definition of 'full gathering permit' in paragraph 1).*
3. *The byelaw prohibits the possession of articles to gather cockles or mussels in breach of the byelaw and specifies the fishing methods that may be used (paragraphs 4, 7 and 8).*
4. *The byelaw prohibits the possession of cockles or mussels gathered in breach of the byelaw (paragraph 5) and provides for their redeposit (paragraph 9).*
5. *The byelaw sets minimum sizes for cockles and mussels (paragraph 6).*
6. *The byelaw provides an exemption for a person who carries out an act which would otherwise constitute an offence if it is in accordance with a written permission issued by the NIFCA permitting that act for scientific, stocking or breeding purposes (paragraph 10).*
7. *The byelaw provides that a person does not need a permit to gather less than 5kg of cockles or mussels for personal consumption from areas that are not closed or in Commercial Shellfish Fisheries Areas (paragraph 11).*
8. *The byelaw provides for the annual closure of cockle fisheries throughout the District for a specified period (paragraph 12).*
9. *The byelaw provides for the designation of certain cockle beds as Commercial Shellfish Fisheries Areas as shown in the indicative maps (paragraph 13).*



**Fig 1. Ribble Commercial Fisheries Area with known historical cockle beds**



**Fig 2. Morecambe Bay Commercial Fisheries Area with known historical cockle beds**

10. The byelaw provides an application procedure for permits (paragraphs 14 to 20).
11. The byelaw provides for permit holders to file returns (paragraph 21).
12. The byelaw provides for the renewal of permits and the issue of new permits (paragraph 22).
13. The byelaw provides transitional arrangements for those with a right to gather shellfish under existing byelaws (paragraphs 23 to 26).
14. The byelaw provides for the issue of support worker permits (paragraph 27).
15. The byelaw provides that a full gathering permit must be endorsed if the holder uses a boat to access shellfish beds (paragraphs 28 and 29).
16. The byelaw provides for the revocation of specified byelaws that previously applied in the District (paragraphs 30, 31, and 32).

The North Western Inshore Fisheries and Conservation Authority and the North Western Inshore Fisheries and Conservation District are defined in articles 2, 3 and 4 of the North Western Inshore Fisheries and Conservation Order 2012 (S.I. 2010 No. 2200).

*Byelaw confirmed 23.08.12*

#### **NWSFC BYELAW 13A - COCKLES AND MUSSELS -MANAGEMENT OF THE FISHERY**

1. The Committee, may close any cockle (*Cerastoderma edule*) or mussel (*Mytilus edulis*) bed or part of a bed for the purposes of fishery management or for controlling the rate of exploitation with regard to cockles and mussels.
2. Such closure shall be for a specified period and be undertaken only after the Joint Committee has consulted such persons or bodies appearing to them to represent local cockle or mussel fishermen, and provided the Committee has been advised by fishery scientists who appear to them to be suitably qualified, as to the need for such action.
3. No person shall, without the consent of the Committee, under the written authority in that behalf signed by the Clerk, remove, take or disturb any cockle or mussel from a bed or part of a bed of cockles or mussels which has been closed pursuant to this byelaw.

*Byelaw confirmed 29.03.96*



## NWSFC BYELAW 16 – SHELL FISHERY -TEMPORARY CLOSURE

Where, in the opinion of the Committee, in any fishery, any bed or part of a bed of shellfish is so severely depleted as to require temporary closure in order to ensure recovery, or any bed or part of a bed contains mainly immature shellfish which in the interests of the protection and development of the fishery ought not to be disturbed for the time being, or any bed of transplanted shellfish ought not to be fished until it has become established, and where the bed, or part thereof, has been clearly defined in notices displayed in the vicinity prohibiting the removal or disturbance of the shellfish, no person shall, while the bed or part thereof is so defined, take away or otherwise disturb any shellfish therein.

Provided that no bed or part of a bed may remain closed under this byelaw at any one time for a longer period than one year, without review by the Committee.

*Byelaw confirmed 14.09.73*

## Annex 8a: Byelaw dredge fishing in NWIFCA District

### RESTRICTIONS ON THE USE OF A DREDGE BYELAW 2017

*Byelaw confirmed 13.12.17*

#### Interpretation

1. In this byelaw:
  - a. "AIS" means an operational transceiver of Class A or Class B design that transmits and can exchange accurate information with shore based facilities;
  - b. "the Authority" means the North Western Inshore Fisheries and Conservation Authority as defined in articles 2 and 4 of the North Western Inshore Fisheries and Conservation Order 2010 (S.I. 2010/2200);
  - c. "the District" means the North Western Inshore Fisheries and Conservation District as defined in articles 2 and 3 of the North Western Inshore Fisheries and Conservation Order 2010;
  - d. "dredge" means a dredge, scoop, or similar device and any auxiliary hydraulic equipment that is designed for or capable of taking sea fisheries resources;
  - e. "permit" means a permit issued by the Authority in accordance with this byelaw.
  - f. "specified vehicle" means a vehicle for which a permit to dredge has been issued under this byelaw;
  - g. "specified vessel" means a vessel for which a permit to dredge has been issued under this byelaw;

#### Prohibition

2. A person must not use a dredge for the exploitation of sea fisheries resources except in accordance with a permit issued under this byelaw.

#### Exception

3. Paragraph 2 does not apply to any person performing an act that would otherwise constitute an offence under this byelaw, if that act was carried out in accordance with a written permission issued by the Authority permitting that act for scientific, stocking or breeding purposes.

#### Permits

4. The Authority may issue a permit in respect of a specified vessel or specified vehicle authorising the use of a dredge to fish or take shellfish.
5. Contravention of a permit condition or a flexible permit condition constitutes an offence under this byelaw.

#### Permit conditions

6. A person may apply for a permit only in respect of:
  - a. a vessel for which the person is the owner, the majority shareholder in the company that is the owner, the leaseholder or the charterer or;
  - b. a vehicle for which the person is the owner, the majority shareholder in the company that is the owner or the leaseholder.

7. An undamaged identity tag supplied by the Authority must be permanently attached to a specified vehicle.
8. Permit applications may only be made using the form available from the Authority.
9. A permit is valid from the date of issue to 31 December of the same year unless specified in the permit
10. A fee is payable prior to issue for each permit as follows:

a.	Vessels 15 metres overall length and over	£9,000
b.	Vessels less than 15 metres overall length	£1,000
c.	Vehicles	£1,000
11. The Authority may charge a fee of £50 to issue a replacement permit or vehicle tag.
12. A permit:
  - a. is not transferable from a specified vessel or specified vehicle to another vessel or vehicle;
  - b. must be available for inspection by an IFC officer during a compliance visit to a vessel or vehicle;
  - c. remains the property of and must be surrendered to the Authority if no longer required.
13. A permit holder must not obstruct an IFC Officer.
14. Fishing returns must be filed as required by the Authority providing dates, times and locations of dredging and the quantity of fish taken. Returns including nil returns may be required for all months for which permits are valid.
15. The Authority may suspend a permit until outstanding returns have been filed.
16. A specified vessel used in conjunction with a permit must have a fully functioning AIS transmitting information including the vessel's identity course and speed at all times when the vessel is not stationary in port.
17. A permit holder must notify the Authority by phone, text or email at least 2 hours prior to commencement of fishing in conjunction with a permit.
18. A permit holder must notify the Authority of any change in the information provided to obtain a permit during the period when the permit is valid.

#### **Flexible permit conditions**

19. On receipt of the information specified in paragraph 20, the Authority may, in order to promote sustainable exploitation of sea fisheries resources, attach flexible conditions to a permit including some or all of the following:
  - a. dates, times or tides during which using a dredge for the exploitation of sea fisheries resources is permitted;
  - b. areas where using a dredge for the exploitation of sea fisheries resources is permitted;
  - c. species for which using a dredge to fish is permitted;
  - d. the type, size or design of dredge which is permitted;

- e. the maximum number of permits which can be issued for a fishery;
- f. the maximum number of dredges or total length of dredges that a vessel or vehicle may use in a fishery;
- g. the total catch limit permitted within a specified period or a specified area.

#### **Review procedure**

- 20. The Authority will review flexible permit conditions no less than once every 4 years as follows:
  - a. the Authority will consult in writing with permit holders and such other stakeholders, organisations and persons as appear to the Authority to be representative of the interests likely to be substantially affected by changes in permit conditions;
  - b. the Authority will decide whether to add, vary or remove any permit condition taking account of the consultation responses and information received in accordance with paragraph 20;
  - c. following a decision by the Authority, permit holders will be notified in writing and permits will be amended as necessary with no charge.
- 21. The information in paragraph 19 is:
  - a. information and advice received from permit holders;
  - b. scientific and survey information gathered by the Authority or provided to the Authority by any other organisations or persons as the Authority thinks fit;
  - c. advice provided by Centre for Environment Fisheries and Aquaculture Science or Natural England or any other organisations or persons as the Authority thinks fit;
  - d. an impact assessment of any proposed changes;
  - e. information from any other relevant source.

#### **Revocation of byelaws**

- 22. The byelaw with the title "Byelaw 12 Restrictions on fishing for bivalve molluscan shellfish" made by the North Western and North Wales Sea Fisheries Committee under the Sea Fisheries Regulation Act 1966 (c.38) section 5 and confirmed on 21 January 1998 is revoked.

#### **Explanatory Note:** (This note does not form part of the byelaw)

*This byelaw prohibits the use of dredges towed by vessels or vehicles for fishing within the NWIFCA District without a permit. The permit application requirements and the conditions of use are set out in the byelaw. In addition the Authority may attach conditions which may be varied to promote sustainable exploitation of sea fisheries resources. The procedure by which permit conditions may be varied is set out in the byelaw.*

*Vessels for which permits have been issued must carry a functional automatic identification system (AIS) which meets Class B design (tested and certified compliant by a notified body under the Radio Equipment Directive) or the higher specification Class A design (International Maritime Organisation (IMO) performance standard in the SOLAS Convention Chapter 5 Regulation 19 Section 2.4.5).*



## Annex 9 – Code of Conduct for Intertidal Shellfisheries



### *North Western Inshore Fisheries and Conservation Authority*

### *Code of Conduct for Intertidal Shellfisheries*

Fishing for cockles and mussels on the shore is a long-established activity. In recent years the level of activity has increased, and there has been increasing public concern about it.

By observing this simple code of conduct you can help to reduce complaints and protect your own long-term interests.

#### **1. Treat the foreshore with respect**

Much of the foreshore is privately owned. Many landowners tolerate access to and from shellfisheries. This does not include the storage of fishing equipment or catches on private land. To protect your own interests:

- Don't damage gates, fences or signposts;
- Don't block access routes; and
- Get the landowner's agreement before storing any fishing equipment, vehicles or catches on private land.

#### **2. Use vehicles on the shore carefully**

Many landowners and coastal residents are concerned about the use of tractors, ATVs / Quad Bikes, and other vehicles on the shore. Try to minimise complaints by:

- Ensuring all vehicles are in good repair and have exhaust silencers;
- Keep noise to a minimum - especially early in the morning and at weekends;
- Avoid churning up mud at the top of the shore;
- Don't abandon vehicles on the shore.

#### **3. Leave the shore as you find it**

Frequent complaints are made about litter being left by fishermen. This includes food wrappers, cups, sacks used to transport shellfish, and shellfish dropped or discarded on the shore.

- Clear up any litter left at the end of the day;
- Don't leave unwanted shellfish or sacks lying around; and
- If storing gear or shellfish on the shore, make sure it doesn't impede access.

#### **4. Have regard for wildlife**

Much of the seashore is protected by wildlife designations. It is a criminal offence to harm protected wildlife. To avoid possible prosecution:

- Don't disturb bird nests or eggs;
- Avoid nature reserves;
- Don't take vehicles across areas of saltmarsh or seagrass; and
- Contact the NWIFCA office for advice if in any doubt.

#### **5. Fish sustainably**

IFCA byelaws protect the long-term future of shellfish stocks, and must be complied with at all times. Complying with byelaws protects your own future livelihood. You can help further by:

- Scattering riddled shellfish evenly back on the bed they were removed from - don't leave them in a heap;
- Avoid harming or gathering juvenile shellfish - they are the future of the fishery; and
- Ensure that vehicles used on the shore don't harm the shellfish beds.

#### **6. Observe other guidance & advice**

Other authorities may provide guidance relating to your activities. You should ensure that you are aware of:

- Guidance issued by local authorities and landowners concerning access and other issues;
- Guidance issued by the Health & Safety Executive and the Coastguard.

For further information, contact the NWIFCA at our Carnforth offices or visit [www.nw-ifca.gov.uk](http://www.nw-ifca.gov.uk)

## **Annex 10     Management of Seed Mussel Stock**

Certain conditions need to occur for the NWIFCA to authorise fishing of seed mussel, namely that the stock has been assessed as in imminent likelihood of being lost to the fishery through natural causes, and subsequently that a high proportion of it will not grow through to reach size; and that conditions pertain to fishing being possible without risk of damage to the cobble and boulder substrate conservation features. These include:

- settlement in high abundance and density, and;
- fast growing and high deposits of pseudofaeces (mussel mud), and;
- the mussel mud becoming very soft and loose and at risk of being washed out, taking the mussel with it;
- or dense settlement being heavily predated on by thousands of starfish.

The fishery is highly variable depending on the vagaries of the stock, and the changes in the dynamic environment of the north west coast and have to be assessed on a year by year basis.

Annex 11 - Minutes of NW&NWSFC meeting March 1971 (highlighted by M.Knott)

38. AT A MEETING of the Scientific and Pollution Sub-Committee held at the Municipal Annexe, Dale Street, Liverpool, at 2.30 p.m. on Thursday 25th March, 1971

PRESENT: Messrs. S. Baxter (Chairman), J.P. Ennis, Dr.J.D. Fish, E. Hardy, Captain W.B. Herbert, H. Hunt, E.L. Lloyd-Jones, H.M. Manning, Professor W.T.W. Potts and E.I.S. Rees.

APOLOGIES.

39. Apologies for absence from Mr. J. Beardsworth and Mr. J. Taberner were presented.

PROCEEDINGS.

40. RESOLVED: That the minutes of the last meeting held on 20th November 1970 be approved as a correct record and signed by the Chairman.

MUSSELS FOR RE-SEEDING.

41. At the request of the Severnside Oyster Co. (Bangor) Ltd., the Sub-Committee proceeded to consider and discuss with them the utilisation of the unexploited mussel stocks in Morecambe Bay and for this purpose there were present, in addition to the members of the Sub-Committee, the following persons:-

Representing the Ministry of Agriculture Fisheries and Food Scientific Department, Conway:

Dr. P. Dare

Representing the Severnside Oyster Co. (Bangor) Ltd.:

Mr. J.G. Sprött (Director)

Mr. R.G. Shaw

Mr. R. Teck

The Committee's biologist briefly reviewed the history of the mussel beds in Morecambe Bay and referred to earlier reports made to the Committee by its officers. These reports had indicated the existence of considerable and regular settlements of mussel spat, particularly in the Heysham area, which, due to predation and to scouring of the banks by strong tidal currents and gales, rarely survived to marketable size. The Committee had for a long time been impressed by these regular and abundant settlements and had realised that this stock could be a most valuable source from which to re-seed other areas. Surveys had been carried out, and encouragement given by the Committee towards the utilisation of this otherwise wasted resource; however up to now there had been little requirement for large supplies of seed, and economic methods of large-scale transport had not been developed.

The need for large quantities of seed mussels had now arisen, and there had also been improvements in the techniques of collection and transport and in our knowledge of the size and regularity of the settlements.

The Superintendent reported that the land between high and low water mark was in private ownership and did not, as is generally the case, belong to the Crown Estate Commissioners. Because of this, there could be some difficulty in getting



permission to take vehicles on to it, whereas there would be less difficulty if the seed mussels were harvested using a boat. He instanced the fact that Morecambe and Heysham Corporation owned the land down to low water mark off the Borough, and they issued licences for the digging of bait. He also referred to the Public Health Shellfish Order which was in force for the Heysham area and which prohibited the taking of mussels for human consumption unless subjected to cleansing or sterilisation.

Dr. P. Dare outlined the research programme at present being carried out in the area by Ministry of Agriculture Fisheries and Food personnel from the Fisheries Laboratory at Conway. The purpose of the programme, which was begun in 1968, was to obtain accurate information about the settlement and survival of spat at Heysham and Roosebeck and to carry out periodic stock surveys in the two areas. In effect it served to quantify and pursue in further detail the surveys initiated by the officers of the Lancashire and Western Sea Fisheries Joint Committee. He was of the opinion that 4,000 tons of relayable mussels could be harvested from the area of the Roosebeck outer skears known as Smooth America. The maximum amount was generally present in September; by the end of that month or in October, 75% - 100% of the stock would have vanished as a result of gale damage and predation. The accumulated mud was also washed away during the winter leaving the area clear for fresh settlements of spat from January onwards.

Thus the programme had served to confirm previous knowledge of the area, and from now on greater emphasis would be laid on methods of exploiting this spatfall e.g. by encouraging the spat to settle directly on ropes laid on the mussel beds and then hanging these ropes vertically in a fattening area such as the Menai Strait. The biology of these hanging cultures would be further investigated; from preliminary results it appeared that survival and growth of the seed mussels was better on ropes hung in the Menai Strait than on the mussel beds at Morecambe.

Mr. Sprott thanked the Committee for their invitation to come and discuss the matter, and stated that the Severnside plant at Bangor now seemed to have passed the experimental stage in which it had been for the last 8 - 10 years. During that period local supplies of seed mussels had been sufficient, but now additional supplies of seed would be needed beginning in the 1972/73 season. This had led his Company to look again at the resources in Morecambe Bay which, as had just been pointed out, were ample for their purpose and were otherwise going to waste. During the discussion reference was made to previous quantities of seed obtained from the area and Mr. Sprott confirmed that these trial efforts had not been successful. His Company would now however like to look at the Heysham and Roosebeck areas again, to try various dredging methods and to take a sample by road to the Menai Strait.

The Clerk reported that on two occasions the Annual Inspection party had referred to the problem of utilising these resources and, in order to ensure that they would be available to anyone who wished to use them, they had discussed the possibility that the Committee might provide a suitable craft which could be used for the collection, transport and laying of seed mussels in any part of the District. It would have to be a



fairly big vessel because of the minimum quantity of seed needed and because the seed would have to be transported across considerable distances of open sea. If Severnside were now to do this part of the work, i.e. to provide a vessel, would they be prepared to collect seed for use by other fishermen?

Mr. Shaw replied that his Company would be prepared to make supplies available to others should sufficient seed be gathered to suit their own requirements. This would be made available on a cost basis, but he would like it to be appreciated that there was only a limited time during which seed could be harvested from the South America skear. The area was fishable by traditional dredging methods for only 8 weeks in the year (July - September). If sufficient tonnage could be collected over and above their requirements in that period then the excess could be made available to other fishermen. The season could be extended by using the suction dredge developed by his Company and the White Fish Authority, and they would like permission to develop the hydraulic dredge for this purpose.

Dr. Dare confirmed that using the hydraulic dredge would enable the season to be extended backwards by about one month.

Reference was made to previous trials of the hydraulic dredge which had been observed by the Committee's officers and during which a considerable proportion of the cockles harvested were found to be damaged. It was pointed out that no apparent improvement had been observed in this feature of the cockle harvester during the four years between the earliest and most recent trials observed. It therefore seemed likely that similar damage would be caused to young thin-shelled mussels, particularly if these were held together in bunches. Dr. Dare explained that these young mussels were not embayed or clumped.

Professor Potts enquired whether the Company had any ideas for overcoming the problem of shell damage.

Mr. Teck in reply explained that the major proportion of the damage was believed to occur at the bend in the pipe immediately above the dredge and was due to turbulence of the water flow at this point. He proposed to remove this bend and felt that this would remove the cause of the damage. He also intended to explore the possibility of using a submersible fish pump to lift the mussels and he would like permission to experiment with a number of other methods also. Mr. Rees added that, from the results of some experiments he had carried out, he considered young mussels to be less liable to damage in the dredge.

Mr. Manning considered that progress should be encouraged but wished it to be placed on record that the Ulverston Coast Road fishermen had a local interest in the Roosebeck area.

The desirability of control by means of a Regulating Order under the Sea Fisheries (Shellfish) Act 1967, and the limitation of licences thereby, was then discussed. The representatives of the Company stated that it would be in Severnside's interest to have the area subject to a Regulating Order and that they would support the Committee in obtaining such an Order. The Company would also welcome the presence of

one of the Committee's scientific officers at any trials that would be carried out. If given permission to go ahead, the Company would like to tackle the area firstly using the suction dredge experimentally and secondly by the removal of seed using conventional methods. They would also like permission to dredge for sub-littoral mussels and to explore further the possibility of landing seed at Heysham.

The following points were then put forward as embodying the main requirements of the Company:-

- (i) obtaining a Regulating Order to cover the mussel beds
- (ii) investigating the possibility of using vehicles on the foreshore
- (iii) investigating the possibility that sub-littoral stocks of mussels might be present in the area
- (iv) with a view to systematic harvesting of the seed mussels permission be granted:-
  - (a) for the collection of seed at Roosebeck by conventional dredge, and
  - (b) for the development of a modified hydraulic lift dredge for use at Heysham and Roosebeck.

The representatives of the Severnside Oyster Co. were informed that the Committee would consider these matters, and after expressing their thanks and their opinion that the meeting was of considerable value to them, they departed.

The members then proceeded to give further consideration to points (i) to (iv) above, and it was

RESOLVED: That

- (1) in the opinion of this Committee the vast resources of seed mussels which annually go to waste should be utilised and with this in view permits should be issued under Byelaw 1 for a period of one year at a time for
  - (a) the removal, for transplantation, of seed mussels from areas at Roosebeck by conventional dredge (these areas to be defined by the Committee's officers so as to avoid any conflict with areas used by local fishermen), and
  - (b) the development of a hydraulic lift dredge on parts of the Roosebeck and Heysham mussel beds and that this development be under the observation of the Committee's officers;
- (2) provisions of the permits to be decided by the Committee's biologist and Dr. P. Dare of the Ministry of Agriculture Fisheries and Food;
- (3) enquiries be made regarding the possibility of supplies of sub-littoral mussels being available in the District;

- (4) enquiries be made as to the possibility of using vehicles on the foreshore; and
- (5) application be made for Mussel Fishery Regulating Orders under the Sea Fisheries (Shellfish) Act 1967 and such Orders to provide for the limitation of licences.

## Annex 12 - MAFF data on South America 1968 - 1981

bed name	settlement year	year	month	Biomass (kg)	Area of skear (m2)	density no/m2	bulk kg/m2	mean length (mm)	skear condition and other comments on data	quality of data (source)
South America	1968	1968	6	900000	405000	37000	3.25			extensive sampling
South America	1967+	1968	6	350000	405000	350	1.25			extensive sampling
South America	1968	1968	7						spat field built up rapidly in last month	observation
South America		1968	10	963000	230850	7500	8.1		43% of bed lost following 10 days of sw gales	extensive sampling
South America	spat	1969	1			192000		1.3	widespread spatfall over landward third, locally thick. Some 1968 seed persists	core samples
South America	1968	1969	1			1000		25		estimate
South America	spat	1969	3			94000		1.5	spatfall extends beyond 100 acres estimated last year	core samples
South America	spat	1969	4			171000		2	further spat growth and settlement	core samples
South America	1969	1969	5			122000	0.16	2.5	spat forming thick mats in many places. Large number of starfish present below low-water springs along west side	study plot sample
South America	1969	1969	6	1000000	504000			9	uniform expanse of small mussels	estimate
South America	1968	1969	6	250000				25	attacked by dense swarm of starfish	estimate
South America		1969	6	3000000	546750		6		vast expanse of seed but bed rapidly becoming unstable	extensive sampling
South America	1969	1969	8			13400	5.9	17.6	mussel bed being destroyed rapidly by tidal scouring in the north and predation by starfish in the south	study plot sample
South America		1969	9	2800000			5.51		scouring has left a thinned but more firmly set population. Spat starting to recolonise bare hardcore behind advancing starfish swarm	extensive sampling
South America	1969	1969	10			5040	7.51	23.7	scouring virtually complete and starfish swarm has vanished recently. Zone cleared by starfish is being recolonised by 1969 seed washed out from unaffected areas	study plot sample
South America	spat	1969	12			54000			no visible sign of winter spatfall but found in later analysis	core samples

South America	1969	1969	12			5105	9.32	25.7	still much firmly set seed over northern half of skear, plus some seed spreading back to starfish-cleared zone down west side	study plot sample
South America	spat	1970	1			59000			on bare ground cleared by starfish	core samples
South America	1969	1970	1			3800	7.09	26	much firmly-set seed survives over most of northern skear but scouring has occurred at northernmost tip and in south-east	study plot sample
South America	spat	1970	2			52000			entire skear probably has a substantial and continuing new settlement	core samples
South America	1969	1970	2			4000	8.15	26.9	marked scouring continues at southern and northern extremities of seed area	study plot sample
South America	spat	1970	3			100000			spatfall appears widespread but patchy	estimate
South America	1969	1970	3			3905	7.8	27	no further scouring	study plot sample
South America	spat	1970	4			190000			little change has occurred in past month	core samples
South America	1969	1970	5	1050000		3975	11.7	29.3	most of skear covered with a good spatfall	study plot sample + extensive sampling for biomass
South America	1969	1970	6			3900	16.6	34.4	mounds of 1969 seed in northern sector are rising rapidly	study plot sample
South America	1970	1970	6			13765	1.26	7	spatfall formed dense carpet wherever there was barren, stony or shelly ground, but light and patchy below LWMST	study plot sample
South America	1969	1970	7			3545	15.9	34.8	mounds of 1969 seed in northern sector are softening rapidly and seed is breaking loose	study plot sample
South America	1970	1970	7			1940	0.35	11.3	skear well covered with spat except at southern tip, where a kelp forest has suddenly developed, and down part of the east side where some scour has recently occurred	study plot sample
South America	1970	1970	8					17.5	much of skear still heavily set with 1970 seed though cover is breaking into discrete firm mounds due to scour.	observation



South America	spat	1970	8					8	southern end of the skear is largely barren with kelp forests but a few patches of summer spat were noted on the stony extremity	observation
South America		1970	9	900000			3.2		recent gales have removed seed from wide areas. Surviving area of seed, at northern end, comprises low but hard set mounds of 1969 and 1970 mussels amidst numerous bare patches	extensive sampling
South America	1969	1970	10			95	0.65	38.5	quantities of 1969 and 1970 mussels survive in northern and eastern sectors while all scoured areas have reverted to stone and shell hard core	study plot sample
South America	spat	1970	11			30000				core samples
South America		1970	11	50000					whole skear scoured almost clear of mussels but entire skear appears suitable for fresh spatfall	estimate following severe scouring
South America	spat	1970	12			53000		1.4	new spat visible sporadically	study plot sample
South America	spat	1971	1			137000		1.5	spatfall well under way	core samples
South America	spat	1971	2					1.5	spatfall is good and extensive, though patchy	core samples?
South America	1970	1971	2					21	a few small mounds of 1970 seed survive here and there but have poor growth	estimate for few surviving mounds
South America	spat	1971	3					2	no marked change but general increase or spread of spatfall	core samples?
South America	spat	1971	4					2.7	spatfall developing very gradually	core samples?
South America	1970	1971	4					24.5	sand recently deposited on west side of skear where patches of 1970 seed still survive	estimate for few surviving mounds
South America	1970	1971	5					28		estimate for remnants
South America	spat	1971	5					5	spatfall has produced a very good settlement over most of skear	estimate for widespread settlement
South America	1971	1971	7					16	very good crop of seed developing over most of skear	observation
South America	1970	1971	7					33		observation
South America	spat	1971	8		708750			20	fine crop of 1971 seed covering a very big area	estimated area of spatfall

South America	1970	1971	8					38	two large areas of 1970 survivors found in southern part of skear	observation
South America	spat	1971	8					12		observation for spat downshore
South America	1971	1971	8					18	tidal scour has just begun across the central area where some 1971 seed has been swept off its mounds into hollows	study plot sample
South America		1971	9	1.3E+07						estimate
South America	1970	1971	9					41	good patches of 1970 survivors in a few places	observation
South America	spat	1971	9					16	major part of skear holds a massive crop of 1971 seed	observation
South America		1971	9		1356750				much of the eastern and central sector is scouring gradually into hummocks and mud patches	revised estimate based on more extensive coverage
South America	1971	1971	11					26.1	surprisingly large quantities of 1971 seed survived the recent gales, the gales having washed out accreting mud allowing the seed to settle in a more stable state	study plot sample
South America	1971	1971	12					26	surprisingly good quantities of 1971 seed remain despite much scouring in last month	observation
South America		1972	1						little change since December. Trace of new spat on few small patches of stony skear which have reappeared	observation
South America		1972	2						spat most plentiful on humps of sand and shell at northern end but much of area covered by clay and shell hummocks not washed away or almost washed clean to stones with only sparse patches of spat and 1971 mussels	observation
South America	1971	1972	3	500000				30	bad condition for spatfall with large areas covered by dense mounds of 1971 survivors alternating with stretches of firm mussel mud	estimate for 1971 seeds diffusely spread over wide area
South America		1972	4						essentially same condition as in March with no spatfall on 90% of area	observation
South America		1972	4						patches more suitable for spatfall	observation

South America		1972	5	1400000					biggest starfish swarm since 1969 has appeared just below ELWMST at least 600 x 50 yds	estimate for prime-seed mussel
South America	spat	1972	5						1972 spatfall has failed so far except small, fairly dense patches scattered over northern tip	observation
South America	1970	1972	5					44		observation
South America	1971	1972	5					27.5	large quantity of 1971 seed has survived in two areas at the southern end, mixed with a few 1970 survivors	observation
South America	spat	1972	6					8	virtually no change since May with very little spatfall	observation
South America	1970	1972	7					45		observation
South America	1971	1972	7					35	1971 seed still occurs in south and west but central and eastern sectors are scoured to hardcore and appear suitable for settlement. Starfish have eaten virtually all the sublittoral mounds of 1971 mussels	observation
South America	spat	1972	7					14	spatfall still poor	observation
South America	spat	1972	8					22	spatfall has generally failed to materialise apart from patchy winter spatfall at north end	observation
South America	1971	1972	8					37	Good dredgeable 1971 mussels on Falklands and also 1970/71 seed at southern end. starfish have destroyed all sublittoral year-old seed in 3 months	observation
South America	1972	1972	9					26	no spatfall since January	observation
South America	1971	1972	9					40	big area of 1970/71 seed at southern end is still very good for dredging as are small areas on the west side. Starfish have moved little since last month and being eaten by gulls	observation
South America	1972	1973	3						a few small patches of seed remain from the poor 1972 spatfall at north end	observation

South America	1971	1973	3					48	several hundred tons of 1971 mussels have survived at the southern ends of the skear	observation
South America	spat	1973	3					2	very heavy settlement over northern end, good patches down scoured east side and one extremely dense patch on Falklands but otherwise light	study plot sample
South America	spat	1973	4					2.1	no further settlements since early March, but spat now very conspicuous	observation
South America	1972	1973	4					34.5		observation
South America	1971	1973	4					50	mixed 1970/71 stock at southern end looks good. Starfish have extended further up west side	observation
South America	spat	1973	7					11.5	early spatfall has redistributed itself to occupy most of the barren areas on east side and fill previous gaps elsewhere	observation
South America	1971	1973	7					50.1	large quantities of 1971 mussels have scoured away. Some 1973 spat have appeared among the old mussels in places. Starfish still present along the west side spread along nearly a mile	observation
South America	1973	1973	8					14	entire skear is well covered by 1973 settlement. Older mussels appear to be being overwhelmed by new settlement on Falklands	observation
South America	spat	1974	4					2.5	mostly poor spatfall	observation
South America	1973	1974	4					24	excellent 1973 settlement has survived well and covers much of north end, west half and parts of Falklands	observation
South America	1971	1974	4					53	many small patches of 1971 mussels still survive at the south end with scattered individuals up the west side	observation
South America	1974	1974	7					15	1974 settlement confined to broad northern part of Falklands plus light settlement at southern extremity of South	observation

									America and small patches up west side	
South America	1971	1974	7					55	very thin sprinkling of 1971 mussels survive mainly at southern tip of South America and northern end of Falklands	observation
South America	1973	1974	7		100000			32	most 1973 seed in north and centre had been smothered by accreting sand and an exceptionally rich growth of Enteromorpha, leaving only a narrow zone down western margin good quantities still on Falklands and seaward end of South America	observation plus estimate of 1973 coverage mixed with some 1974 seed
South America	spat	1977	6					3	spat spreading over clean stony ground	observation
South America	spat	1977	7					10	slower growing than Heysham	observation
South America	spat	1977	8					10	growth poor compared with previous years	observation
South America	spat	1977	8					11	surprisingly large area of settlement	observation
South America		1980	4						generally good covering of spat and 1979 seed	mapped observations
South America	1979	1981	4					37.7	moderate stocks of viable two year old mussels remain	observation
South America	spat	1981	4					3	light to heavy spatfall in parts	observation
South America	1980	1981	4						moderate quantity of 1980 seed mussels	observation



## Annex 13 South America Seed Mussel Historical 1993 – 2012

An extended study by MAFF biologists in the 1970s documented the frequent presence of a great biomass of immature mussels, often thousands of tonnes, and extreme annual mortality, and this underpinned the creation of the Morecambe Bay Fishery Order in 1978. The purpose of this was to allow the Sea Fisheries Committee to regulate the collection of seed mussels from the South America Skear, with the presumption that bulk harvesting would take place to stock the Several Order layings created in the Menai Strait.

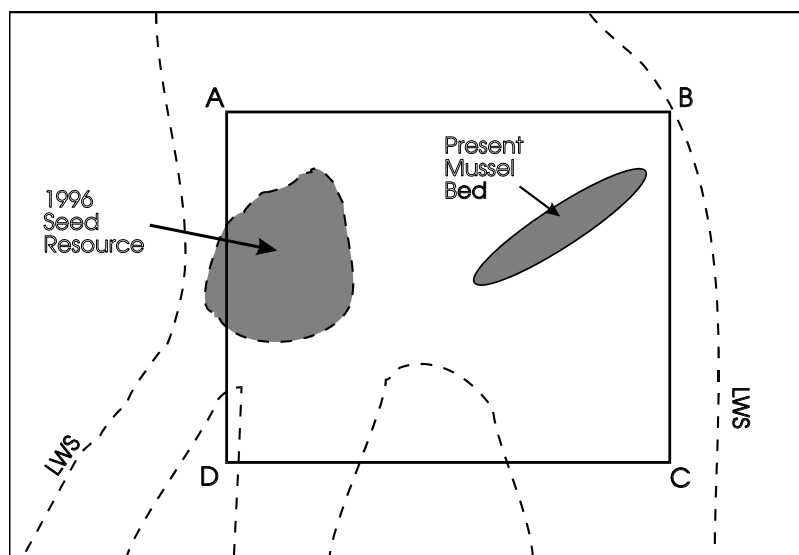
### 1993 – October:

It was observed that little recruitment appeared to have taken place in 1993, only one limited area containing seed mussels (<45mm shell length). However, unusually for this area there was a significant quantity of harvestable mussels remaining from the 1992 spatfall and surviving the 1992/93 winter. Hand-gatherers were observed working the part of the South America skear to the immediate north of the Morecambe Bay Regulating Order area.

1995 – NB THIS SOUNDS LIKE HEYSHAM FLAT - surveyed by 2 ATV off Still Ostrea dried out on bed. No detectable spatfall, but there was an unusually high number of mussels surviving from previous years. This may have been due to recent atypically calm, mild winters. It is likely that the presence of these older mussels, together with high populations of tube-dwelling worms along the western edge of the skear, had encouraged the accumulation of coarse sand over the bed thereby inhibiting spat settlement. Densest area contained significant patches of good quality mussels with relatively few barnacles although some were lightly infested with the boring worm *Polydora*.

1996 – estimate of 5 – 6000 tonnes on 2<sup>nd</sup> July over 27.5ha. Mean length 10 – 15mm (range 5 – 20mm) depending on position on bed. Dredging in August but gales and losses in September. 3280 tonnes harvested.

1997 – length frequency mean appears to be 42mm from n = 189. range 35-50mm, discounting a few very newly settled. 500 tonnes – survived from 1996. Authorised for dredge in August but lost before vessels arrived. Co-ordinates of authorised area under FO:



### CO-ORDINATES OF LICENSED AREA

A	54° 03.50'N	03° 07.00'W
B	54° 03.50'N	03° 06.00'W
C	54° 03.00'N	03° 06.00'W
D	54° 03.00'N	03° 07.00'W

1999 – July stock assumed to be 1650 tonnes, approx.. 10ha. Same area as 1996. proposed to authorise, under Byelaw, and licence through the Regulating Order, the removal of as much as possible of this stock by dredging, commencing Monday July 19th 1999. Initial interest was from mussel growers in the Menai Strait, although the proposal has also been drawn to the attention of other potential growers within the District. The proposed authorisations would be valid until August 13th 1999. Fishing would be restricted to the hours between sunrise and sunset, in order to facilitate monitoring of the operation. 'The ephemeral nature of the mussels means that the effects of removal by dredging are unlikely to be different to removal by bad weather. Dredging is not 100% efficient, and there are inherent errors in the estimation of standing stock. However, it is likely that 1000 tonnes may be removed by the operation and 500 tonnes left behind. It is however likely that the stock remaining after dredging will have an enhanced probability of survival. With a more sparsely spread population, the build up of faeces and pseudo-faeces will be reduced, indeed it may be removed by tidal scour, leaving the remaining stock more able to attached to the limited number of hard anchorages.'

SSB – not affected as they will not reach maturity here. Also looked at what stocks elsewhere in Bay.

#### 4.2 'Effects on bird feeding

Observations by the Committee's staff in this area are limited, but do not record the presence of eiders or other birds feeding on mussels. Gulls and cormorants have been observed during low-water surveys of the area. Intermittent recruitment to the South America Skear in recent years, the ephemeral nature of the mussel stock, and the presence of much greater stocks in the Walney and Foulney areas imply that mussels here are not a critical food resource for birds. However, it is acknowledged that small mussels on South America Skear may on occasion be a potential food resource and a better understanding of bird feeding patterns in the Bay is desirable. In the present case, the unstable attachment of the mussels would indicate early loss is likely even without dredging, so their value as a bird food resource is likely to be limited'.

#### 4.2 Effects on Fish

'Mussels are known to form a food resource for fish, particularly flatfish such as plaice and flounder. However, fish normally take mussels shortly after settlement. The present mussels on South America Skear are already at too large a size to form a food resource for fish'.

Note from BC to EN - In normal years, mussels are not ready for harvesting by dredger from this area until the end of July or into August. However, it is suggested that any harvesting of the present resource should be done at the earliest practical opportunity, as any adverse weather is likely to remove and destroy much if not all of the stock.

Conclude NLSE on Candidate SAC.

2000 – rough biomass calculation of 5070 tonnes.

2001 – large settlement

2002 – April: Widespread settlement of v small spat in the same area as last year (where dredging had taken place) – heavier than 2001. Approx. 50ha. Some larger mussels immediately to seaward of this area being taken by eiders (couldn't fly). Might have been a later settlement in 2001.

June - range 15-19mm shell length. Only a few small patches of 2001 mussels were found, with these being 40-45mm length. Estimated overall biomass of 700-1750 tonnes. Depending upon their progress, and survival, it is estimated that some 4,000 tonnes could be available for harvest. Up to 40cm of mussel mud and estimated that 30% already scoured out. BS 'a suitable seed resource for gathering by dredging, which should be considered as soon as possible in order to maximise the survival of this stock'.

2004 - July Seed area estimated to be 35 ha. Assume % cover = 70%.

Assume equivalent to 24.5 hectares covered with 100% mussel. Estimate between 3500 – 5000 tonnes.

2005 -

2006 - July – Falklands – most extensive spatfall BC had ever seen. Extends to Heysham and over Foulney – eiders seen feeding here, though industry thought they were targeting crabs.

No eider over main Falklands skear – appear to favour more inshore areas or edge of channel.

September 2006 application to harvest seed mussels from the South America skear. The applicant was in the process of transplanting up to 2,500 tonnes of mussels from “Falklands” authorised area to over-wintering ground in the Walney Channel. 800 tonnes had been successfully moved, when fishing on Falklands area deteriorated due to a period of very strong tides. A visit to the “South America” outside of the authorised area, was made, suggesting that a stock of 5,000-6,500 tonnes of fishable mussels presently exists in this area. Wished to remove some 1,700 tonnes of mussels from the South America skear to complete the Walney Channel relay.

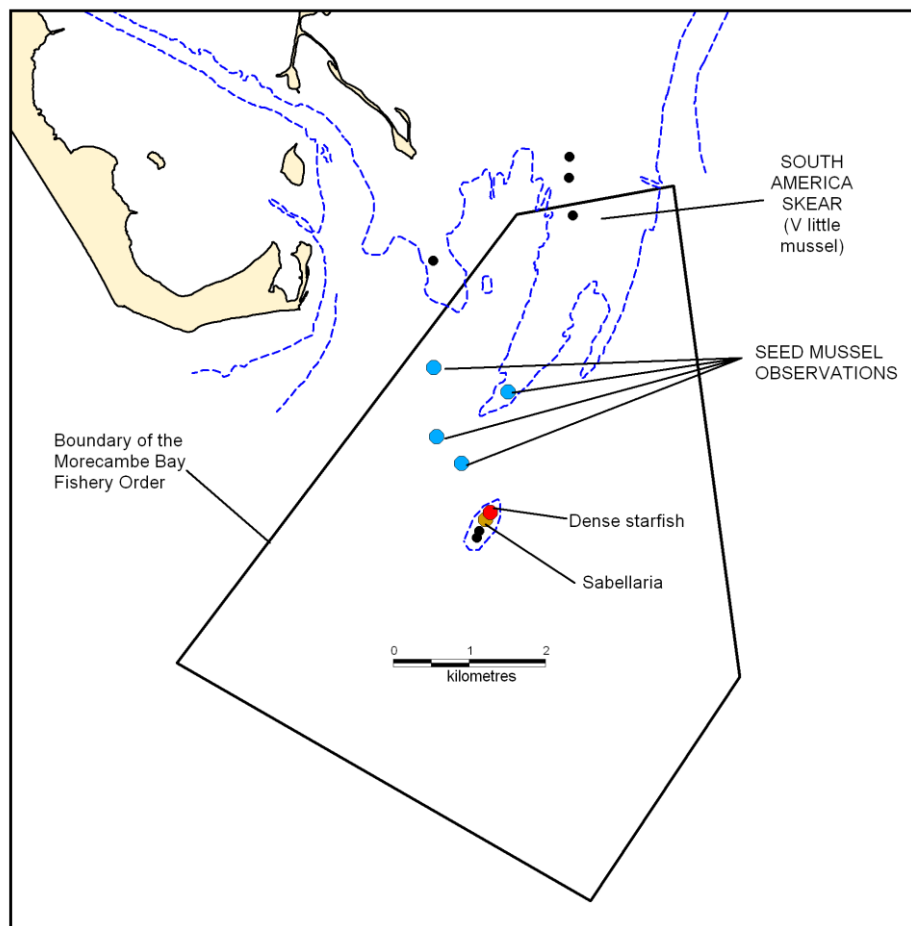
The proposal would leave at least 3,300 tonnes of mussels on South America. The proposal would therefore utilise seed mussels that will otherwise be lost during the late summer or autumn. If successful, the operation would have the effect of preserving those mussels, increasing both the standing stock and breeding population of mussels in the Bay, particularly the Walney Channel area.

No LSE as relaying and providing winter bird resource.

‘The pattern and scale of juvenile mussel settlement was unusual in 2006 in that , as well as the low-lying banks of the South America skear, mussel spatfall had taken place further offshore, on more remote banks and in the shallow sublittoral. Overall, this was one of the largest mussel spatfalls ever observed in Morecambe Bay. In all, some 10,000 tonnes of seed mussels were removed by dredging. None were taken from the South America skear itself, as these mussels were lost by tidal scour before harvesting could take place.

2007 - April 2007 using a helicopter to access offshore areas. The intended purpose of the survey was to identify any areas of new, 2007, spatfall. None were located.

A surprising finding of the survey was that a considerable quantity of 2006 year class mussels had survived in the shallow sublittoral area between South America skear and the Falklands banks. The location of these mussels makes their biomass difficult to quantify, but there is a likely stock of several thousand tonnes. The mussels appear to have grown very little over the winter period, and most are around 20-30mm shell length. At the time of the survey most of the mussels were partly embedded in the substrate, and it is believed that this has enabled them to survive the winter without being eroded. Very few mussels have survived on the drying banks of South America and the Falklands skears. It is possible that the survival of the mussels is due to the thinning of the stock by dredging in 2006, reducing the population density such that the individual mussels can partially bury themselves in the substrate thereby stabilising the bed. This effect has been documented on the intertidal Heysham Flat skear near Morecambe. The position of the seed mussels is shown below.



As well as the mussels, substantial quantities of starfish were found on the offshore areas. On the Falklands bank, the starfish were extremely dense (see Fig. 2), and appeared to be causing total mortality to any remaining mussels. In the denser seed mussel areas starfish were also present, but not yet in such dense swarms. It is anticipated that predation by these starfish will result in near-total loss of the remaining mussels over the early summer period. This order of mortality has been observed on many occasions in the past on South America skear, and in sublittoral areas such as Conwy Bay.

The mussels are now entering a period of growth, and will be expected to emerge from the sediment and build up a layer of mussel mud. It is therefore proposed to authorise their removal by dredging, for relaying elsewhere within the Sea Fisheries District. It is believed that they will become dredgeable on the neap tides in mid-May 2007, and it is therefore proposed to commence harvesting then in order to minimise losses due to starfish predation.

The proposal is to dredge mussels that are unstable, lying on soft mud, and subject to intensive starfish predation. If left unfished, we believe that these mussels will be subject to imminent loss either through erosion or predation. Fishing the mussels may have a thinning-out effect, improving their stability. It is believed that this has been the effect of the 2006 dredging, resulting in enhanced over-winter mortality.

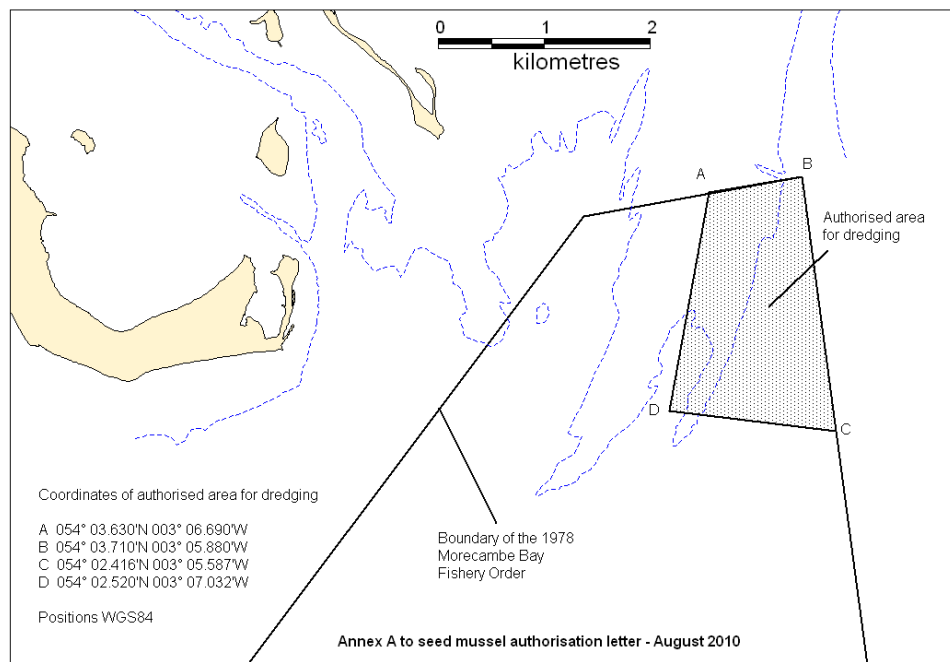
Dredging these seed mussels will enable some of them to be relaid elsewhere in Morecambe Bay, including experimental bottom cultivation. This will increase the supply of mussels available as food for birds, including eider.

We therefore conclude that there will be no likely significant effect upon the SAC or SPA features of Morecambe Bay, and certainly no adverse effect on the integrity or conservation status of the site.

2008 – covered in sand – no mussels.

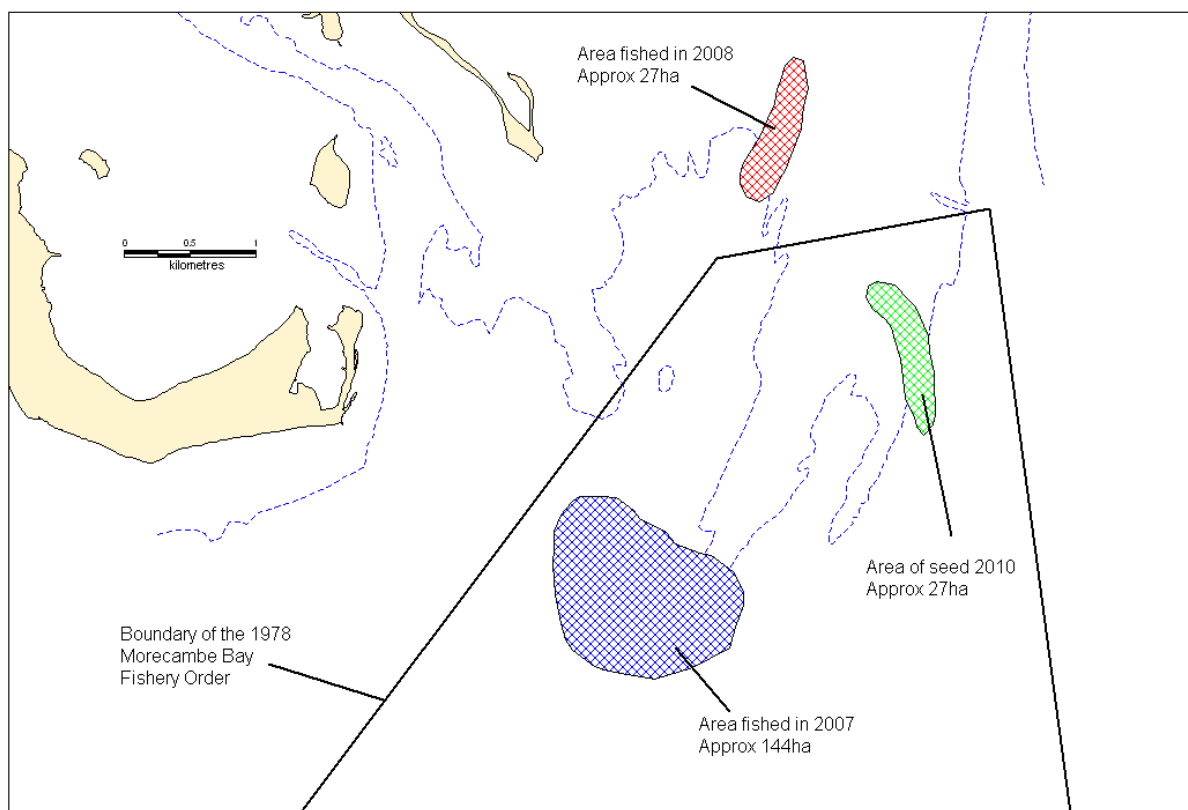
2009 – Fishery Order expired. Covered in sand – no mussels.

2010 – 2 vessels – 4330 tonnes. 21 days total – 182.75 hours.



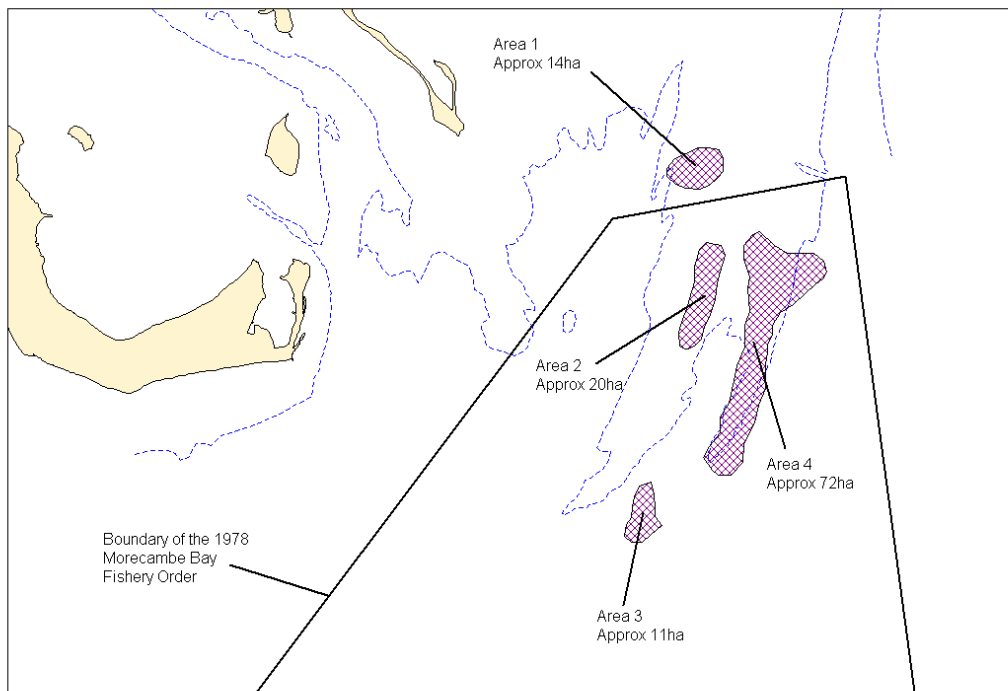
Aerial survey in April 2010 revealed a small area (27ha) of seed mussels (5-15mm shell length)

Since 2007, South America and Falklands skears have been covered by mega sand ripples and as a result no mussel settlement has taken place. However, an aerial survey in April 2010 revealed a small area (27ha) of seed mussels (5-15mm shell length) within the former Fishery Order boundaries. Figure 1 shows this in relation to the last area authorised for fishing within the Fishery Order in 2007 along with another area outside the Order boundary that was dredged for seed in 2008 after consultations with the industry and conservation interests.





July – 120ha in four distinct patches. Already an area of similar settlement around the oyster trestles just to the north of the beds referred to above has been completely washed away as a result of recent south westerly gales. Proposal to fish easterly edge



There are currently concerns about a decline in numbers of the breeding population of eiders on Walney Island. One of the potential contributory factors suggested for this is the effect of the removal of seed mussel by dredging. There is no supporting evidence either way so a precautionary stance must be adopted until cause is established.

The proposal is to allow fishing in an area that covers no more than 50% of the known stock. It is thought that a maximum of five vessels will prosecute the fishery and overall effort is further confined by tidal and weather windows. The likelihood of the fishery procuring all the resource from the fished area is extremely low. Past experience suggests a catching efficiency of between 50-75% on dredged areas so a large proportion of the stock in the fished area will remain.

## 2011

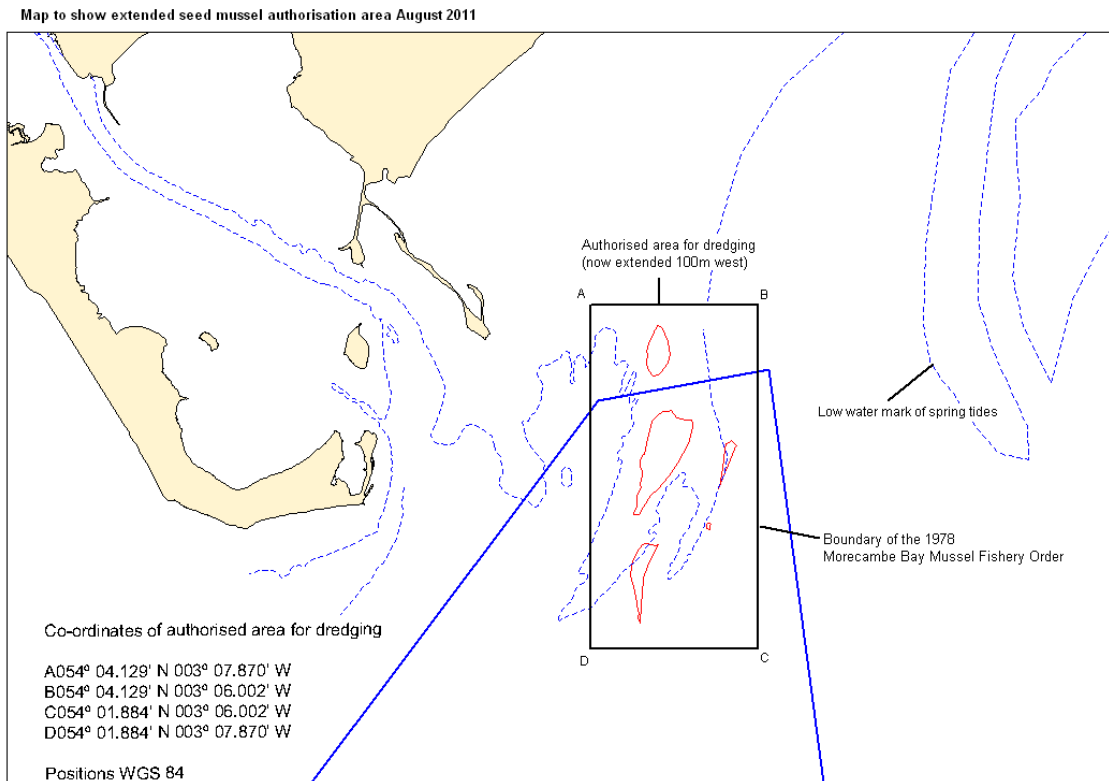
Extensive settlement – estimate of 25,000 – 30,000 tonnes. Still concerns about eiders – in middle of collaborative work with NE and RSPB – although indications are that the eider numbers are rising again (in the Bay) and that it is predation pressures from land mammals that are causing the problem.

5 authorisations were issued in June – start 20<sup>th</sup> June but stock not actually fishable till around 1<sup>st</sup> July. Agreed to TAC of 50% ie. 12500 tonnes because of perceived eider risk. NWIFCA had granted permissions for two relaying trials in Walney Channel – Barrow I where around 840 tonnes were relayed – and North Walney which did not happen.

XXX also relayed seed on the Foulney skear as mitigation to hand-gatherers for Barrow I trial area. (This looked like it had stuck and was healthy in early 2012).

Storms and weather caused problems with fishing – one vessel did not use authorisation at all; one took 20 tonnes for relaying at Ravensglass but it was laid high on beach on hot day and it all died; one tried to take mussels back to Northern Ireland by truck but due to timings at Fleetwood dock lock gates etc it all died. Two from Menai Strait took remainder – and total was 7900 tonnes.

Had a couple of changes to area of authorisation and one time extension into September. Were considering a further time extension into October but observations from industry said it had all gone back in and was not now harvestable (30<sup>th</sup> Sept).



## 2012

March observations from industry - The areas where large mussels have overwintered have suffered a lot of predation and storm damage. The survival rate of these mussels is less than 10%. The ground where these mussels are situated is extremely hard and any survivors are dug deep.

There is a copious recent settlement of seed mussel throughout the whole area. Should this survive the next couple of months it will equal or exceed last year's settlement.

May observation industry - The spat has stayed despite some evidence of heavy weather. The weather has produced some scouring and removed many of the overwintering half grown, as can be seen by comparing the pictures from the 11th March survey and the attached pictures taken yesterday.

The pictures were taken from position 54 03.962' N, 003 07.151' W. I didn't go any further than this position being on foot and having had a relatively late start. The wind had also held the tide in more than expected, occasioning a swim rather than a wade.

As far as I could see, the other customary areas of settlement seemed to be well covered and had the usual numbers of birds in attendance.

# Annex 14 Seed Mussel Dredge Fishing North Morecambe Bay 1999 - 2019

Year	No of Days Fished	No. Hours fished (sum of ind. Vessel totals)	No. Vessels	No. Under 15m vessels	No. Over 15m vessels	Total Landings Declared (tonnes)	Notes
1999	3		3			950	
2000			0			0	May survey - heavy settlement. By July lost to weather
2001			8			4975	
2002			2			3600	
2003			2			2820	
2004			5			4050	
2005			0				Substantial spatfall in April but all gone by June
2006	40		6			10210	
2007			6			1440??	2006 mussel survived the winter but covered in starfish in spring and authorised for fishing
2008			0			0	The bed was sanded over and no fishing took place (Low Bottom was authorised on condition that 25% was relaid for hand-gatherers)
2009			0			0	The bed was sanded over and no fishing took place
2010	16	182.75	2			4330	
2011	20	n/a	5	1	4	7900	
2012	22	n/a	7	1	6	<b>12449</b>	
2013	15	n/a	7	1	6	5806.5	
2014	10	167	3	0	3	1220	Area much reduced as sand cover encroaching on skears
2015			0			0	No fishery - covered in sand
2016	9	154	4	1	3	2700.9	Area fished mainly just off Foulney and on the outskirts of Walney Channel as starfish were devouring mussel on the S. America and Falklands skears
2017			0			0	Not sufficient stock and ground not right to authorise dredge (not enough mud cover)
2018			0			0	Beds could be accessed by quad bike due to sand covering much of skear and channels shallow enough on big tides to get across. What little ground there was held mainly US mussel which was being heavily predated on by starfish.
							Agreement through BMWG for limited US hand-gathering authorisation
2019			0			0	

							Not sufficient stock as shears still mainly covered by sand. What areas there are uncovered with mussel settlement is not putting down enough mud to permit dredging
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