NORTH WESTERN INSHORE FISHERIES AND CONSERVATION AUTHORITY

SEED MUSSEL REMOVAL FROM HEYSHAM FLAT MUSSEL SKEAR
APPROPRIATE ASSESSMENT JULY 2016

Background

1.1 Heysham Flat skear is subject to regular foot inspections by NWIFCA Science Officers due to its locality to the NWIFCA office, the relative ease of access, subject to tides, and the dual responsibilities of managing the mussel fishery and protection of the *Sabellaria alveolata* reef, an Annex 1 habitat qualifying feature of the Morecambe Bay European Marine Site.

During 2016, inspections and surveys have been undertaken on:
11th March (0.4m tide), 5th May (0.5m tide), 23rd May (1.5m tide), 6th June (0.6m tide).

The area in question is shown in Figure 1 below.

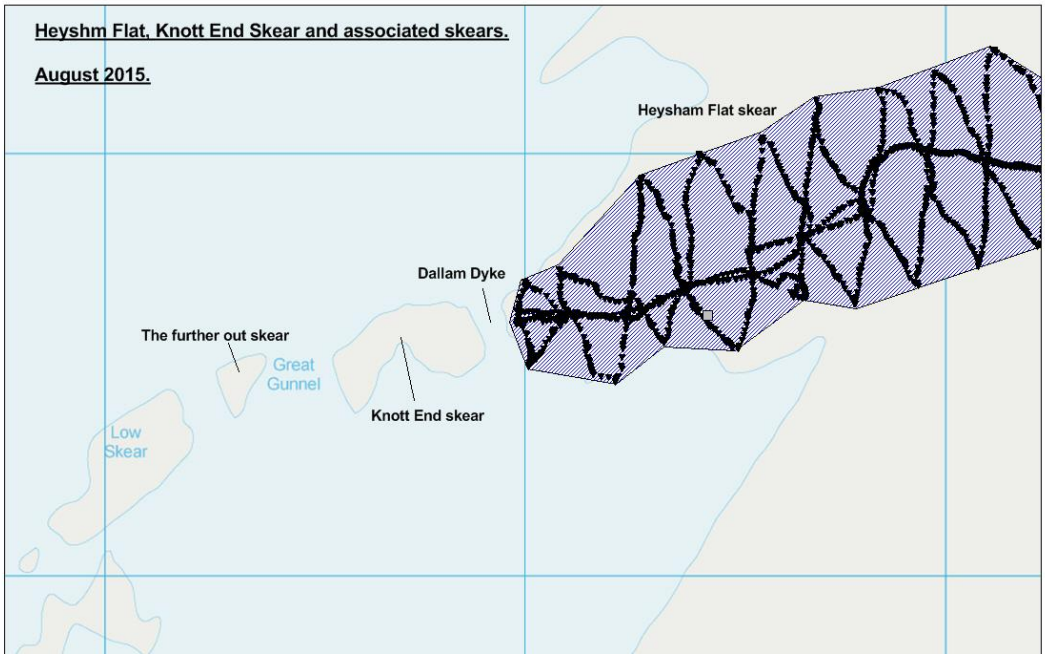

Fig. 1. Illustrative map of Heysham Flat and associated skears 2015.

1.2 The early inspections revealed that in March the main skear was devoid of any mussel other than fresh spat (pin prick size). All the bottom skears had size mussel on, of up to 65-70mm length. In May a vast seed mussel settlement had occurred from high up on the skear to the bottom of Knott End skear, covering the *Sabellaria alveolata* reef area which is in really bad condition, having been buried under mussel and mussel mud almost continuously for two years. This is the worst the NWIFCA Senior Scientist has seen it since her visits began in 2008 (pers comm. Knott. M). The only vaguely healthy-looking area of reef was very small and on the northern extent of the skear next to the channel, although there was mussel spat all around it on other clumps and it may not survive smothering.

There was an expanse of bare cobble and stone on Knott End skear. The best area for seed was nearest to Dallam Dyke, while the bottom end held some size mussel around 55mm. Some samples were taken to check for pea crab. None were found in any of samples taken, which had good meat content in some, looked in spawning condition in others, and some looked spent.

Officers did not attempt to get over to Out skears due to tidal constraints. However gulls could be seen on them and they looked black so it could be assumed that they still held size mussel. A small flock of dunlins was seen feeding on the sand, and a number of small green polychaetes on the mud around the mussels.

1.3 A full survey was carried out on 23rd May when the main skear was surveyed by zig zag transects from a centre line defined by GPS. Fifty paces were taken between quadrats, and percentage cover of the two main mussel types per station recorded (Fig. 2).

The main mussel type was spat higher up on the shore, transitioning into seed (only just 10mm) lower down where the skear remains under water for longer (Fig. 3). As the tide ebbed off the lower end of the skear, gulls were seen feeding on the mussels on the bottom skears across Dallam Dyke, along with some oystercatchers and knot observed in the area.

There was very little *Sabellaria alveolata*; some very small patches were alive, though much was covered in mussel mud and spat/seed (Fig. 4).

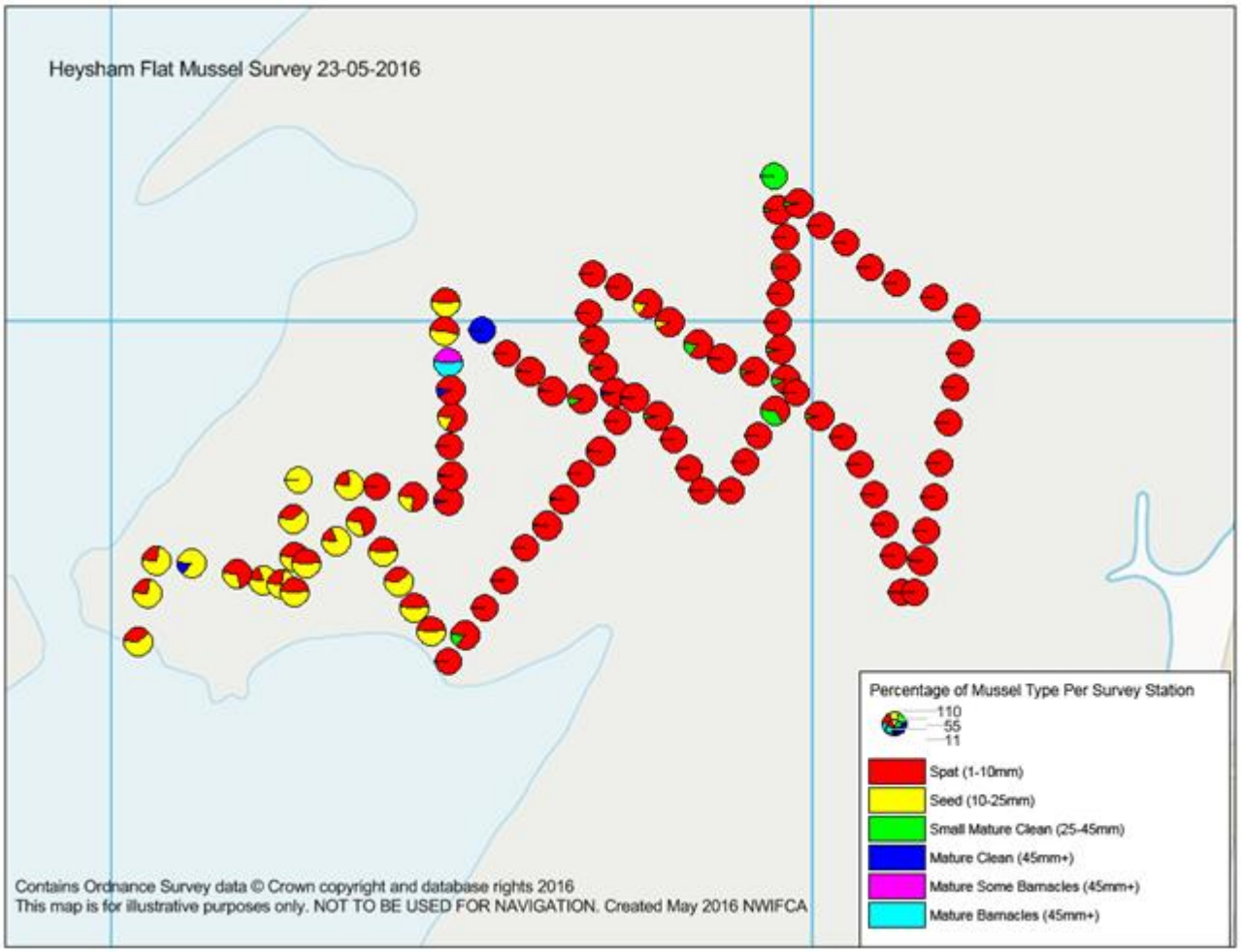

Fig. 2. Thematic map of transect and percentage cover mussel survey. Heysham Flat. 23rd May 2016.

Fig. 3. Dense mussel seed cover. Heysham Flat. 23-05-16

Fig. 4. Sparse Sabellaria alveolata covered in mussel seed. Heysham Flat. 23-05-16

1.4 There has been a long history of the NWIFCA (and previously the NW&NWSFC) authorising a hand-gathered seed mussel fishery on Heysham Flat skear. Management has shown that when mussels in concentrated aggregations such as these put down mussel mud beds in this condition, unless in very sheltered areas, will quickly show catastrophic losses through erosion.

1.5 NWIFCA Officers have records of the spatfall and survival of mussels in this area in recent years. This bed has been classed as an ephemeral bed (Dare. 1976). Annual spatfalls have been regular and heavy over the eastern half of Heysham Flat. Records show that mortality of the first-year mussels has generally been very high. In many years, virtually the entire stock of mussels has been lost in the autumn and winter of their first year. Even when a proportion of the stock has survived this winter period, the relatively high tidal level has resulted in poor growth and continued high mortality.

1.6 The past two years has seen a period of dramatic change at Heysham Flat and other areas of the Bay. The sand that had previously covered the bottom skears washed off revealing bare substrate on which mussels settled. Although the mussel mud under on these skears was over a metre deep and very soft, not all of it washed out as predicted, and some of the stock remained and grew on to size, as it did on the *Sabellaria alveolata* reef towards the bottom end of the main skear. This was all subsequently buried under a mass settlement in spring 2015 and the larger mussel was killed off. A hand-gathering fishery was authorised in 2015, with an exclusion zone around the main reef area as has been practiced over most years in recent history, and 700 tonnes were reported as having been removed.

1.7 Over the winter 2015-16 the mussel on the main skear and parts of Knott End skear were washed out, with some 2014 and 2015 mussel persisting on the outer skears (only accessible on the biggest of tides for short periods of time). The spring settlement has covered the majority of the main skear and parts of Knott End skear.

1.8 It has therefore become difficult to predict which areas and to what extent will erode and scour out during the autumn and winter. The recent monitoring provides evidence that what mussel does persist is on the lower reaches of the skears.

1.9 In 2004, a study was carried out on this part of Heysham Flat Skear, to determine the survival and growth of the mussels, and to assess the effects of simulated seed mussel harvesting (Gascoigne et al. 2007). The study found that the reduction in mussel density due to harvesting was followed by immigration and recruitment. This was due to increased exposure of the underlying hard substrate. Conversely, there was a reduction in density on some un-fished, control plots, where sediment accumulation resulted in loss of stock. By the end of the study there was no apparent difference between the harvested and control plots. The study therefore confirmed that removal of seed mussels can have a “thinning out” effect that leads to improved persistence of the remaining stock on the bed.

<u>Extent and Condition of the *Sabellaria alveolata* reef at Heysham Flat:</u>

There is evidence of a cyclical competitive relationship occurring between the *Sabellaria alveolata* and the mussel on this skear (Knott. 2009). An extensive and healthy looking worm reef was totally inundated with mussel settlement and a build-up of over 1m deep mussel mud during 2008, smothering the worm tubes and causing the reef to crack and crumble under the weight of mud. The NW&NWSFC authorised a hand-gathering fishery for seed mussel that autumn. Following winter storms, the mussel was washed out and the reef looked almost totally destroyed.

A time series of surveys into the distribution and condition of the reef were started in 2011 in partnership with Cumbria Wildlife Trust, which have shown the variability but robustness of the reef. The annual reports (2011-15) can be found on the NWIFCA and Wildlife Trust

websites: http://www.nw-ifca.gov.uk/contents/images/File/2013%20Sabellaria%20Report_SEgerton%20(3).pdf and http://www.cumbriawildlifetrust.org.uk/sites/default/files/distribution_mapping_and_health_assessment_of_honeycomb_worm_sabellaria_alveolata_reefs_on_heysham_flat_lancashire-_vicki_foster_2015.pdf

In summary, inspections and surveys carried out by the NWIFCA in 2011 showed that in the period between 16th June and 30th August 2011 the reef grew from being patchy and low lying, to fully formed large hummocks with evidence of fresh settlement. Interestingly that year, mussel recruitment was relatively slight.

Inspections and surveys during 2012 show that the reef was in a healthy state, having been subjected to a mosaic of mussel settlement, and showing evidence of new worm settlement.

Inspections in spring of 2013 showed that the worm colonies were spreading across the skear and in a very healthy state. However early summer saw at least one spatfall of mussel covering the reef and smaller colony outcrops over the whole skear. The August survey revealed that the reef was covered in mussel and mussel mud, other than the peripheral areas on the western extent where some reef remained intact. Past observations have shown that this level of survival of the *Sabellaria alveolata* is generally sufficient to repopulate the reef again once the mussel mud has been washed off.

Inspections in spring 2014 showed that the reef was again in a healthy state, now colonising areas to the north of the skear that had previously been large tracts of old broken mussel shell. There had been a mussel spat settlement on the skear, and the July survey showed the *Sabellaria alveolata* was now totally covered in mussel and mussel mud. This cycle of events again confirms the competitive relationship between the mussels and the worms on Heysham Flat skear – that in summer and autumn the worms can be virtually wipe out by the mussel and mussel mud, but during winter and spring they repopulate the skear to a healthy state.

Details are given above of the observed state of the skear during 2015 and 2016.

Assessment of Mussel Biomass

Although the NWIFCA utilises survey methodologies such as the 'Dutch Wand' methodology, at certain times to assess mussel biomass, enormous questions remain over the validity of such data for more than a few days after the survey time in an area such as Morecambe Bay, and its application to management decisions over mussel resource.

Mussel can and does recruit to skears in the Bay (Fig. 5) in extraordinarily dense aggregations, and depending on tidal height and period of inundation, as well as sea temperature and chlorophyll levels, can put on growth exceedingly fast, thus increasing biomass equally rapidly. On the contrary, the highly dynamic environment and the process of mussel putting down deep levels of soft mud in pseudofaeces, can also lead to rapid erosion and wash out so that biomass can be diminished overnight. Dense recruitment also results in high levels of competition for food and space, and the act of fishing can have a 'thinning' effect which can actually lead to an increase in biomass.

The resource requirement on the NWIFCA to provide biomass data in which a satisfactory level of confidence could be placed is not realistic or achievable in a constantly changing environment like the Bay.

Other mussel beds within Morecambe Bay

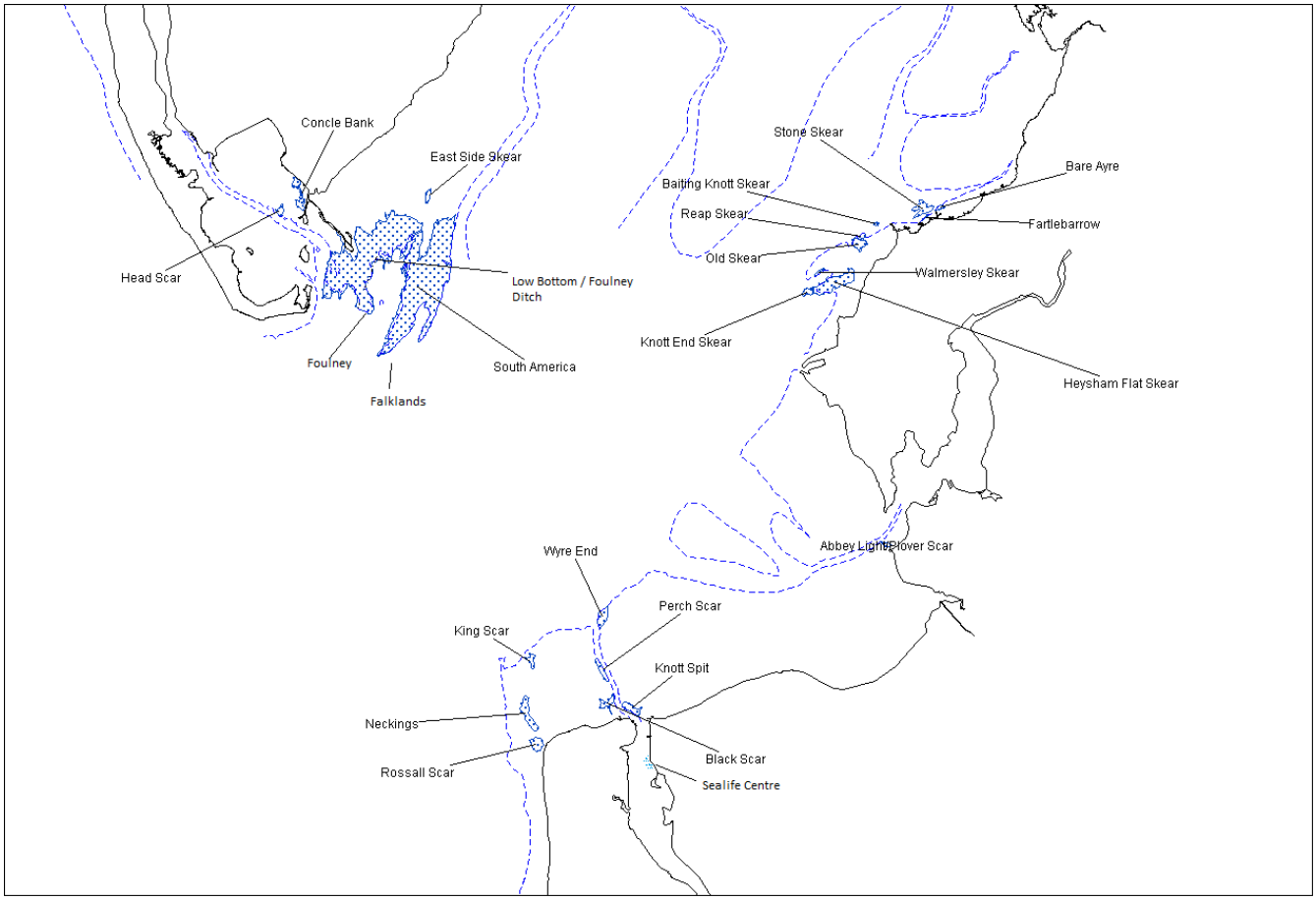

Fig. 5. Illustration of the position of mussel beds in Morecambe Bay and Fleetwood.

Duddon Estuary – Hardacre:

A survey was due to be carried out on the mussel bed at Hardacre on 7th June 2016 (0.6m tide). IFCOs had reported a spat settlement there earlier in the spring. However when officers arrived they found the sandbanks had shifted and the cobble skears holding mussel were now covered over. Subsequently there is no mussel resource of any note in the Duddon in 2016.

North Morecambe Bay – there are a number of mussel beds in North Morecambe Bay. The map in Figure 6 illustrates their positons in relation to one another.

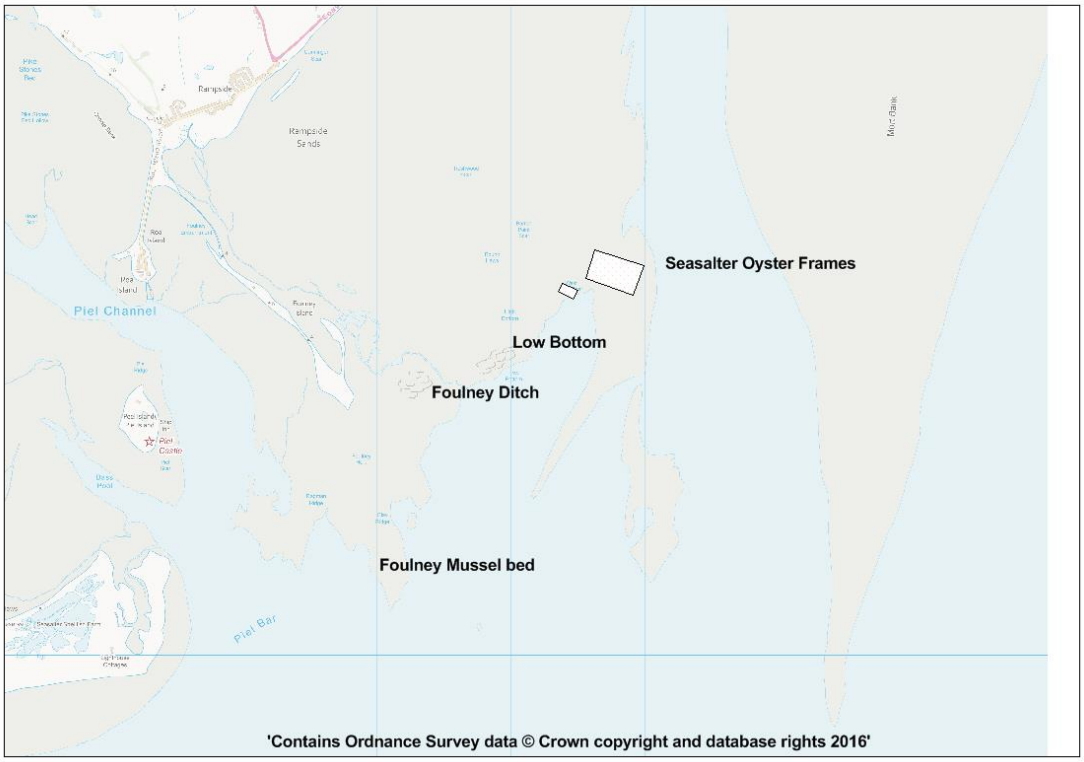

Fig.6. Illustration of position of mussel beds and oyster frames in North Morecambe Bay.

Foulney:

A survey was carried out on 10th May 2016 (0.8m tide) with transects taken across the survey area, with 0.5m² quadrat every 50m recording percentage of mussel type.

The target area of the survey was the main area on Foulney. The area surveyed has a covering of spat which was seen in most survey stations. At the bottom of Foulney (known as the Island) there is an area of mature clean mussel (45+mm) which has a covering of 2016 settlement. Higher up the main skear the mussel is smaller and undersize, and shown on the map as small mature clean which has a settlement of this year's spat on it. Moving to the top of the skear the mussel becomes much more mixed and barnacled mussel starts to appear (Fig. 7).

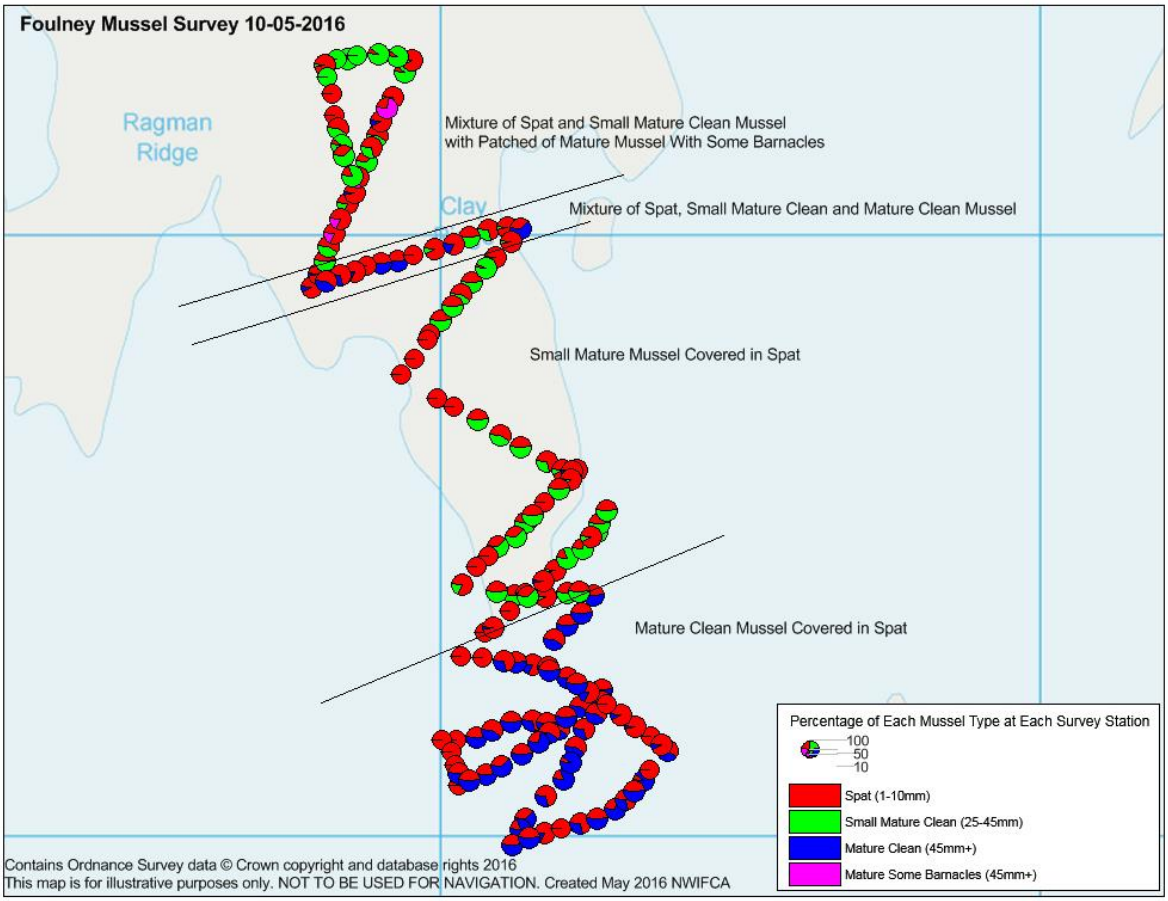

Fig. 7. Thematic map of Foulney Mussel Survey results (10th May 2016)

Foulney has been inspected and surveyed for many years by the NW&NWSFC and NWIFCA. The main skear area has stayed relatively constant and it is reasonable to make an estimate of the area covered in mussel from previous years mapping as being around 41ha holding around 5000 tonnes of mussel.

Foulney Ditch:

A survey was carried out on the Foulney Ditch area on 5th June 2016 (0.8m tide) with transects taken across the survey area, with 0.5m² quadrat every 50m recording percentage of mussel type.

The survey target area was between the 'Ditch' (see Fig. 6) and the previously surveyed area on Foulney (surveyed 10-05-16). The aim was to find the area of stunted mussels which is reported never to reach size before the next years spat covering. The mussel below MLS is reported to get choked out by the new settlement.

The surveyed area has a good covering of newly settled spat which ranged from 2-8mm with the larger spat nearer the low water mark and near to the channel known as the 'Ditch'. There are clear zones with the mussel higher up the shore being older and covered in barnacles (Fig. 8), moving to mussel with a few barnacles mid shore (Fig. 9), to mature clean and small mature clean (40mm size class) at the low water mark. At the bottom of the Ditch there was an area of clean mussel which was a mixture of between 40 and 50 mm. Both of the latter areas were covered in 2016 spat (Fig. 10).

Fig.8. Old barnacled mussel forming a lrage part of the bed on the upper reaches of the 'Ditch' area at Foulney. (5th June 2016).

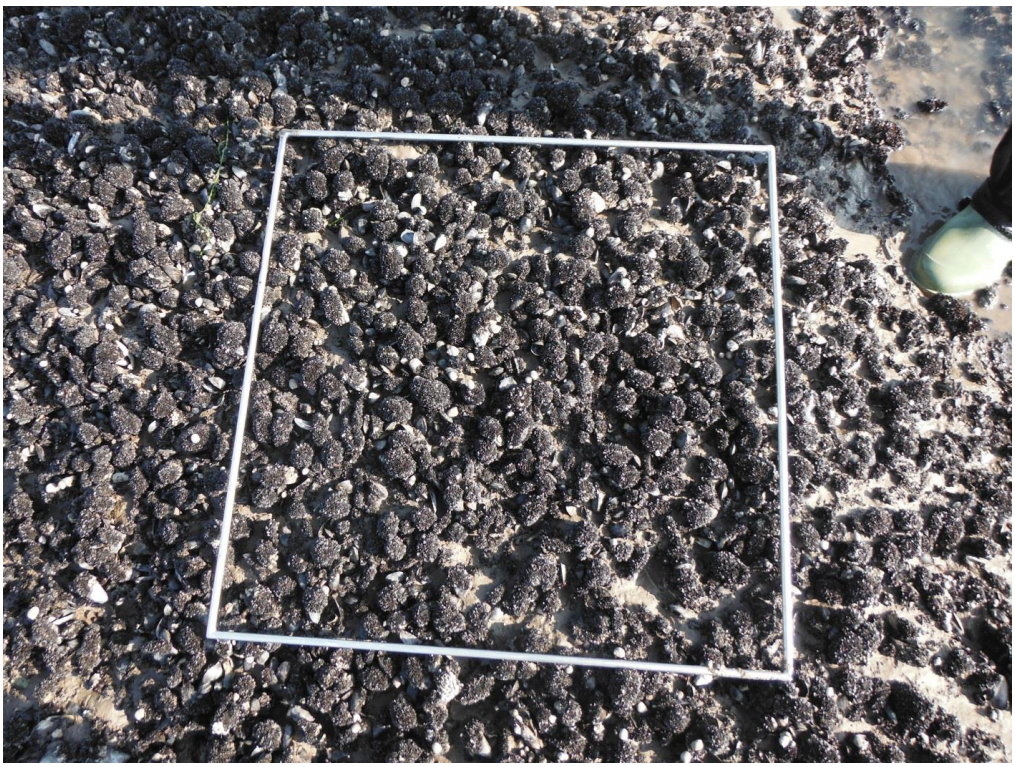

Fig. 9. Mature barnacled mussel with spat cpvering on the mid shore of the 'Ditch' area at Foulney. (5th June 2016).

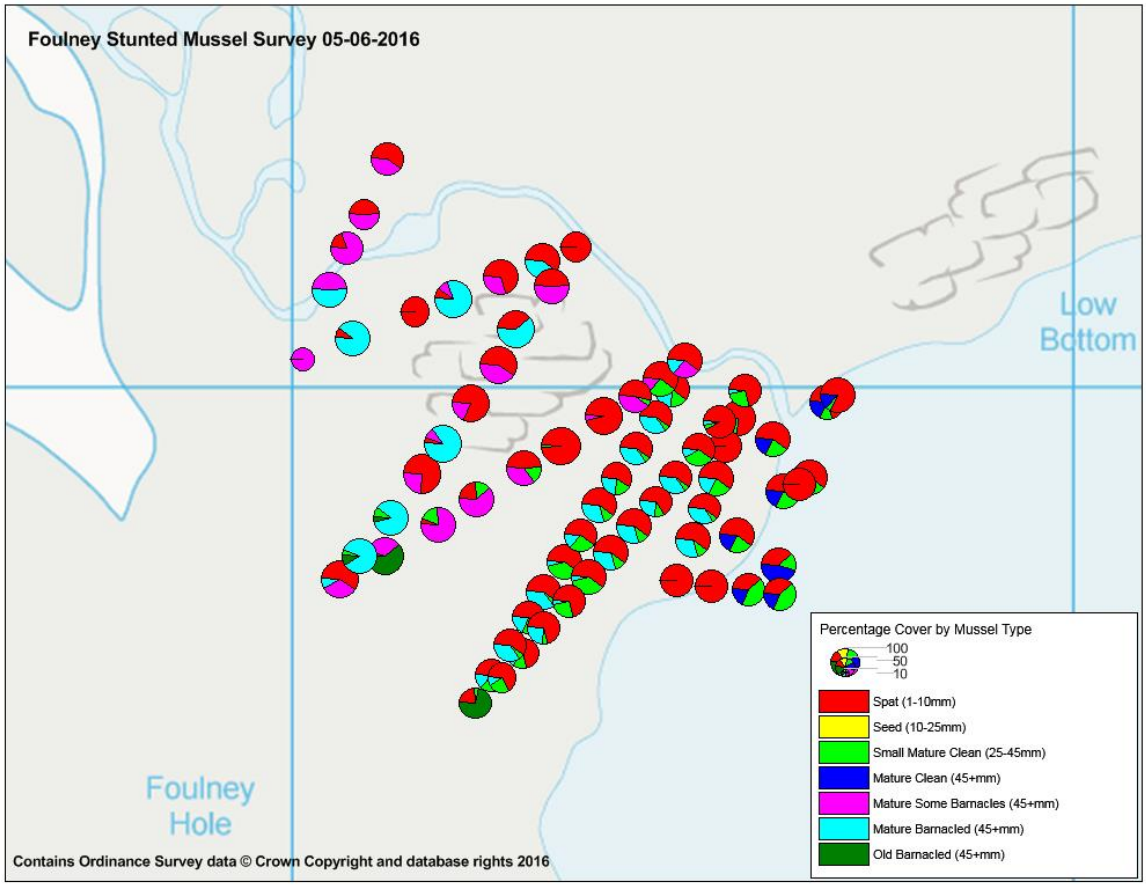

Fig.10. Thematic map of Foulney Ditch mussel survey results (5th June 2016).

Low Bottom – area between Foulney Ditch and the Seasalter Oyster Farm:

An inspection was carried out on 6th May 2016 (0.8m tide) when GPS positions and the type of mussel found at each location was recorded. From this rough polygons were mapped recording the areas of change in mussel types. A large part of the intertidal area had received a very dense covering of 2016 mussel, estimated at 1.2 km² which is growing on at different rates. An indication of the size of spat was given. It was seen that the larger spat was closer to the low water mark (Fig.11).

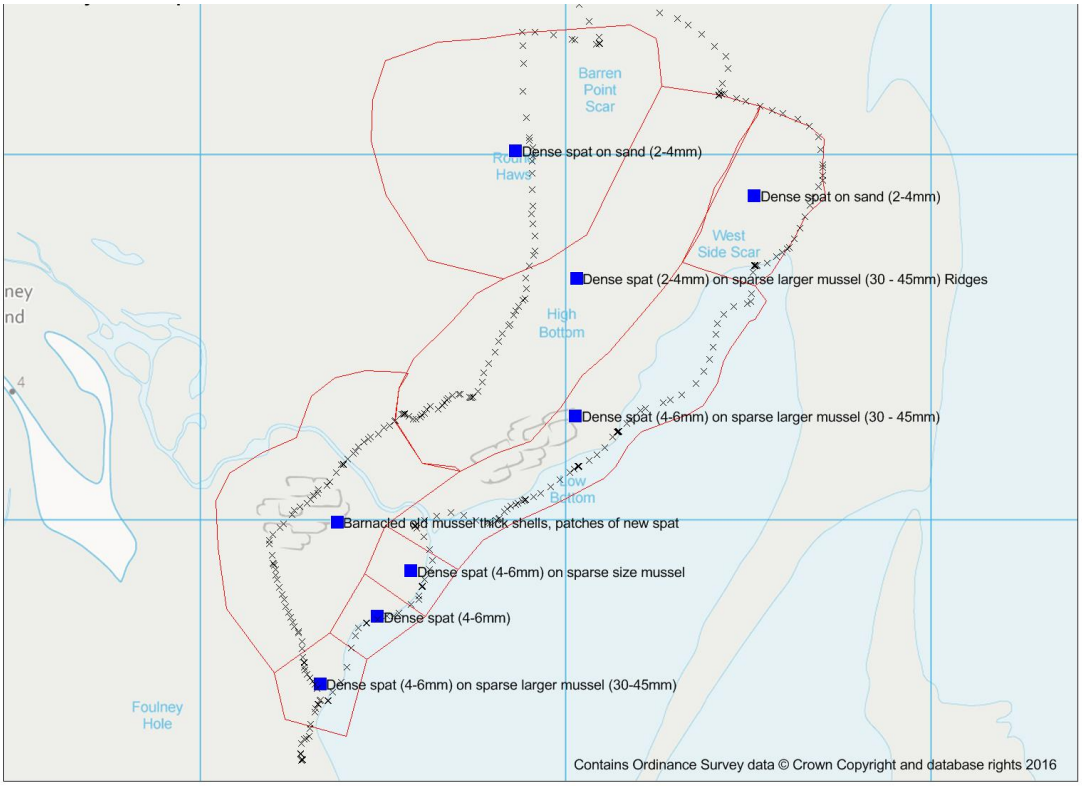

Fig. 11. Mapping to show area pf mussel settlement and different size zones between Foulney Ditch and the oyster frames. 6th May 2016.

Fleetwood Beds:

the mussel beds at Fleetwood were inspected on 6th June 2016 (0.6m tide). Positions of these beds are shown in Figure 12. The mussel resource on each bed is described below:

GPS tracks were recorded of the edge of the mussel beds (Black Scar, Perch Scar, Kings Scar and Neckings) and notes were taken to describe the cover and size of the mussel. This information was made into maps using MapInfo: see figures below for detail of the mussel beds. It was not possible to map Rossall Scar as two ATVs got stuck in the soft mud just before the Scar at low tide, so the team had to leave the beach.

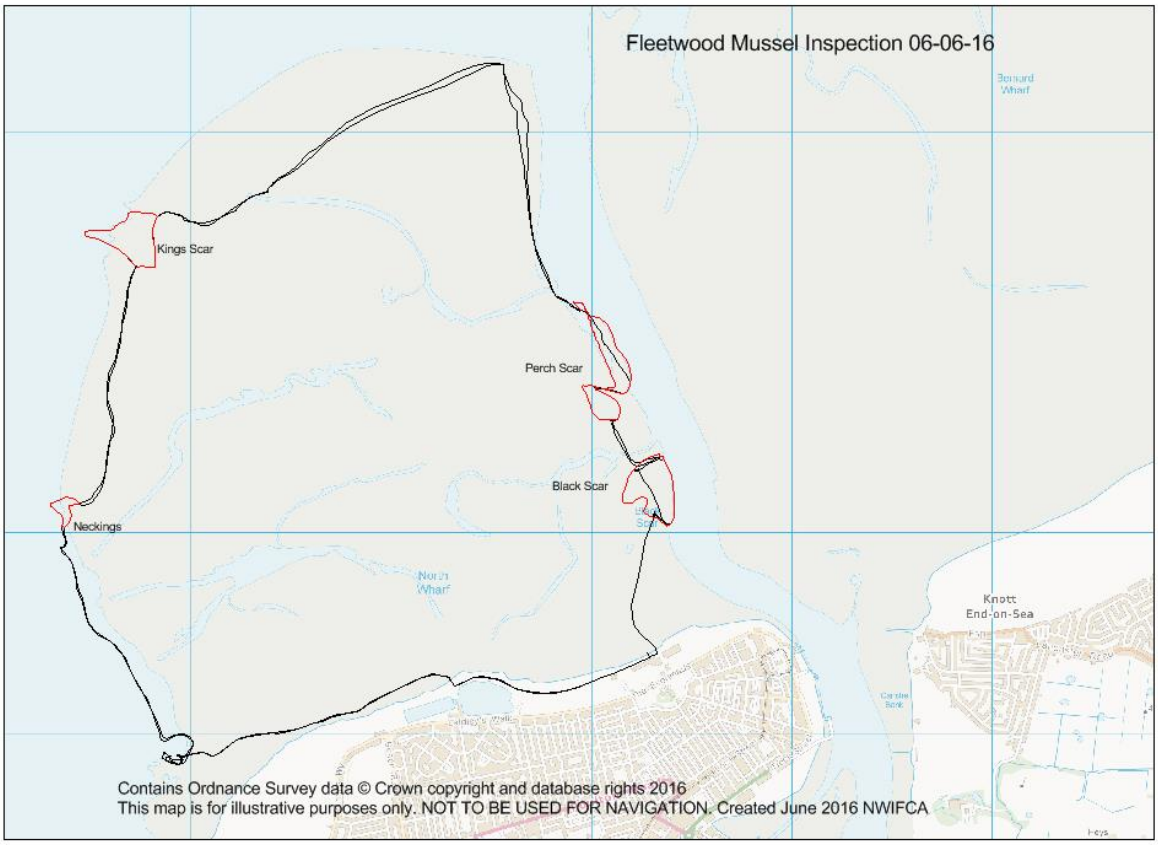

Fig.12 Illustrative map of the positions of the Fleetwood skears. 6th June 2016.

Black Scar: an estimated area of 5.8 ha had 80% cover of 5-8mm mussel, with size mussel along the channel edge (Fig. 13).

Perch Scar: an estimated area of 5.3 ha had a main area 80 – 100% cover of 5-8mm mussel, with a further area having 50% cover of 5-8mm mussel (Fig. 13).

King Scar: only around 0.1ha of the 5.3ha skear had mussel cover, of around 5-8mm. There was a small patch of remaining size mussel.

Neckings: minor spat settlement on this skear.

Rossall Scar: a visual from the heliflight that took place on the same day reported minor spat settlement on this skear.

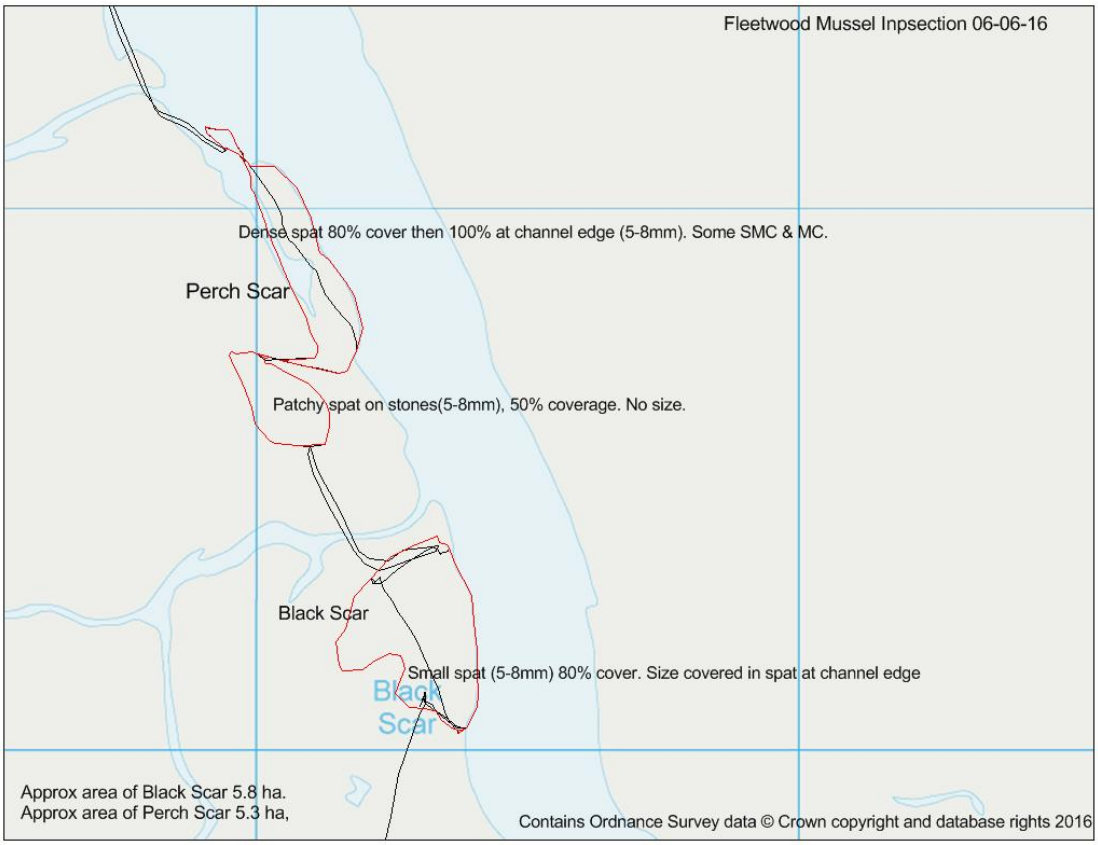

Fig.13. Illustrative mapping of the seed mussel at Perch Scar and Black Scar, Fleetwood, 6th June 2016

Wyre End Skear:

the Wyre End skear and Knott Spit mussel beds (Knott End) was inspected on 8th June (0.8m tide). The bed boundaries were tracked on foot with a GPS. One transect was taken through the middle of the bed and the mussel type was recorded.

There has been a new settlement of mussel which was found on Wyre End skear itself and on patches of mud and sand to the east of the skear. The spat has settled on most surfaces, sand, mud, cobble, live size mussel and dead shell. The spat ranges from 1-2mm to 5mm with the smaller spat being higher above the low water mark. There is a shingle / cobble area in the middle of the skear with a raised elevation. No mussel was found directly on top of this feature but there was pinprick spat down the sides of it (1-2mm). Running south from the main Wyre End skear there is a long thin strip of hard substrate that has had a new settlement of spat (1-2mm). The combined area of these two skears was estimated as 21.7ha (Fig. 14).

Knott spit which is located just off of Knott End-On-Sea has had a good covering of spat in the 4-6mm range, with around 70% - 80% cover. There was an area of size mussel running along the edge of the Wyre. From previous years' mapping Knott Spit totals an area of 16.4ha. Due to the tide a full inspection of the area was not completed. There is another area of mussel further up the Wyre from where the hygiene samples are collected which is estimated to be 100m by 20m running along the edge of the Wyre which is a mixture of size and spat, and known as the Sealife Centre.

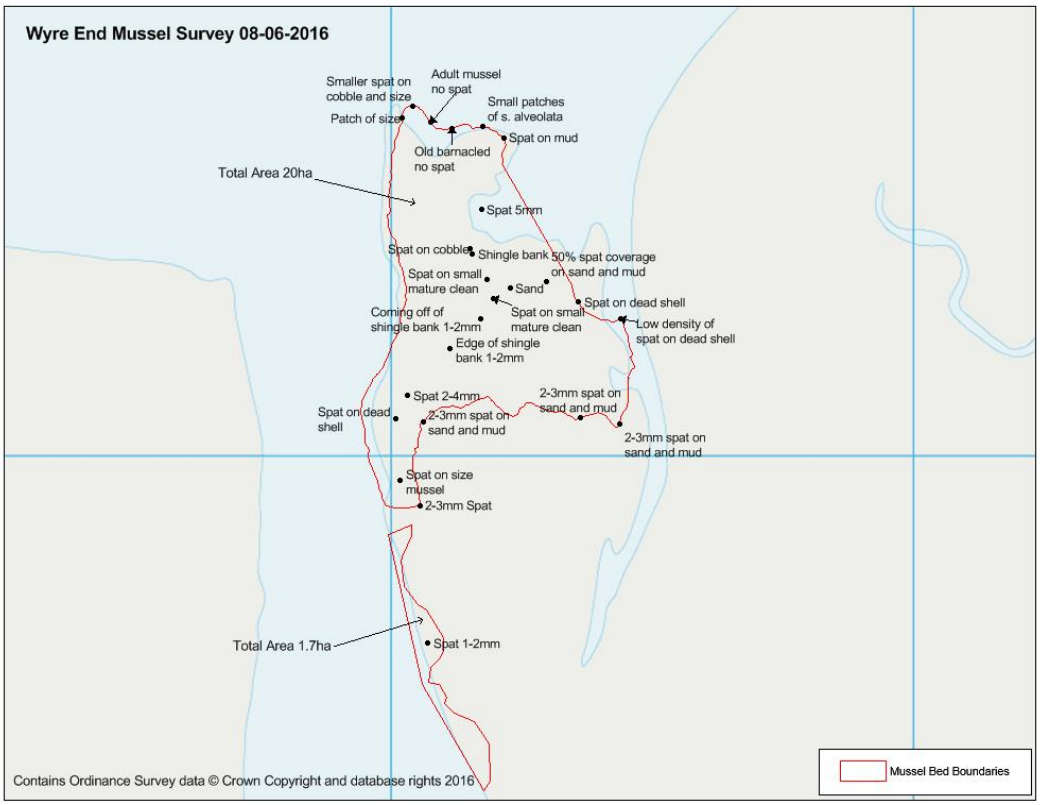

Fig. 14. Illustrative mapping of Wyre End skear and Knott Spit. 8th June 2016.

South America / Falklands

An inspection was made by quad bike on 9th May 2016 (0.5m tide) accessing the beds in question from the shore. It was only possible to reach the Falklands bed on the hour around low water due to water still covering the sandbanks until then. The South America area was passed on the way to the Falklands.

South America – there was a limited area of skear exposed which was covered in mussel spat and gulls. It was problematic to track the bed and obtain an estimate of the size of the area due to time and tide constraints. However a very rough estimate from mapping software is given as 19 ha (probably under-estimate). (See Fig. 15).

Falklands – the northern half was devoid of mussel (had previously had 2014 mussel cover). The southern half of the bed had some remaining size which was being devoured by starfish, which in turn were being predated on by gulls. There was evidence of pinprick mussel spat settlement on top of the larger mussel and in amongst the cobbles. A GPS track round the exposed bed was taken and estimated as 3.8 ha. The mussel appeared to continue out into submerged areas that could not be accessed.

An industry heliflight was attended by a NWIFCA Science Officer on 6th June 2016. This provided visual evidence that the size mussel had gone along with the larger starfish. The new spat also appeared to have gone but this needs to be verified by a further flight / inspection as it may have been too small to be seen from the air. It could be seen that mussel extended out into sub-tidal areas. A new area to the west that had not been known to hold mussel before was also found and from very rough mapping was estimated at being around 115 ha in size (Fig. 15).

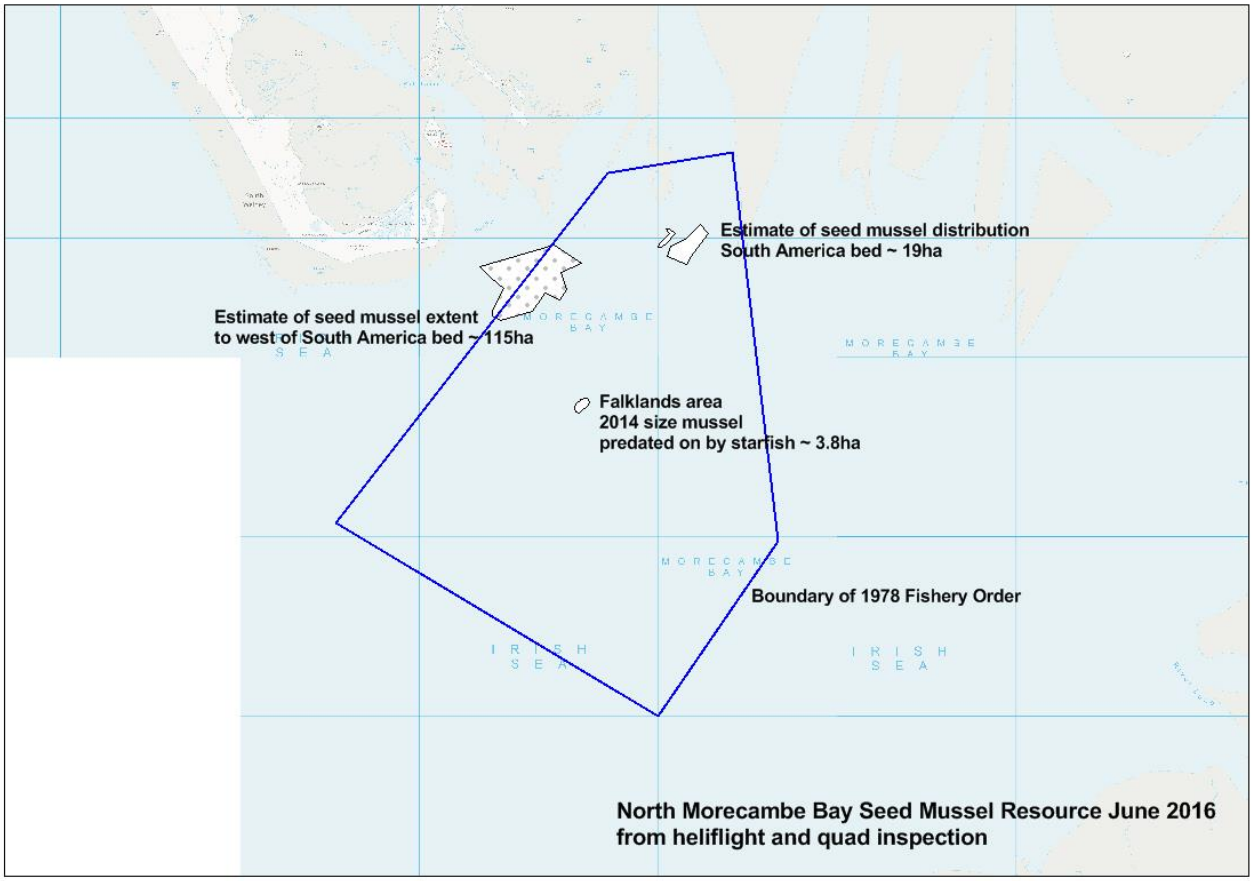

Fig. 15. Morecambe Bay Seed Mussel – Falklands and South America seed mussel resource from quad and heliflight inspections May and June 2016.
Blue polygon show boundary of old 1978 Fishery Order.

Proposed plan or project

2.1 The main areas of spat and seed mussel are shown in Figure 2 above. There is also seed on Knott End skear across Dallam Dyke. This can only be accessed on the largest tides, and the amount of time on this skear is limited.

2.2 It is proposed to permit the harvesting of seed mussels by hand-gathering from these areas as soon as the mussel is ready for harvest to minimise stock mortality.

2.3 It is proposed to authorise harvest of seed mussel from the area of main *Sabellaria alveolata* reef this year, which has previously been excluded in order to remove the mussel and provide optimum conditions for the reef to re-establish.

2.3 The main seed area where fishing will be authorised is approximately 45 ha in extent holding an estimated 4000 tonnes. The additional area on Knott End skear is estimated as around 5 ha. The further out skears, which are only accessible for short periods of time on the largest spring tides and therefore temporally restricted and unlikely to be fished by more than 6 permit holders, have been estimated at 7 ha (all estimates taken from MapInfo software).

2.4 As in previous years, access to and from the bed, and some transport of mussels from the bed will be by quad bike from the Battery car park in Morecambe. Lancaster City Council issue beach access permits for quad bikes – a maximum of 15. Considering some will tow a trailer with a second quad bike this leaves a maximum of 30 quad bikes on the bed. Only NWIFCA Byelaw 3 permit holders will be authorised to take the seed mussel under derogation from the minimum landing size. Currently around 150 permits have been issued. However recent mussel fisheries in Morecambe Bay (Heysham Flat, Foulney and the Duddon Estuary) have shown only around 40 fishers are likely to prosecute the fishery.

2.5 An alternative for loading the harvest was proposed by Lancaster City Council and was used in the 2014 and 2015 fisheries, whereby they permitted the buyers to bring two tractors with trailers each from Oakley Road on to the sand, and allowed tonning up on the beach. This method was discussed with Natural England representatives on 7th August 2014 and no objections or concerns were expressed. Indeed this has been carried out in the past with this fishery, and it is anticipated will be sued again in 2016.

2.6 The fishery will be restricted to daylight hours, Monday to Friday only between 25th July and 16th December 2016, excluding Bank Holiday Monday 29th August 2016.

European site name(s) and status

3.1 Heysham Flat Skear lies in Morecambe Bay, which has been designated as both a Special Protection Area (SPA), Special Area of Conservation (SAC) and as a Ramsar site. The NWIFCA is required, under the Habitats Regulations 2010 to consider the effects of permitting seed mussel harvesting on the features of the SPA and SAC.

3.2 Heysham Flat Skear contains biogenic reefs formed by the Honeycomb Worm, *Sabellaria alveolata*. This is an Annex I habitat that is present as a qualifying feature of the Morecambe Bay SAC. The main areas of *Sabellaria* reef are depicted on the accompanying map (Annex A).

3.3 The mussels on Heysham Flat Skear form a potential food resource for birds, particularly the oystercatcher, *Haematopus ostralegus*. Oystercatchers are a qualifying species of the Morecambe Bay SPA under Article 4.1 of the EC Directive on the conservation of wild birds (79/409/EEC). During the winter season Morecambe Bay holds populations of oystercatchers of European importance.

3.4 **List of interest features**

Large shallow inlets and bays:
intertidal boulder and cobble skear communities (including mussel and *Sabellaria* communities)
subtidal boulder and cobble skear communities
brittlestar bed communities
intertidal boulder clay communities
coastal lagoon communities

Mudflats and sandflats that are not covered by seawater at low tide:
mud communities
sand communities
eelgrass beds

Estuaries
Reefs
Perennial vegetation of stony banks (vegetated shingle)
Atlantic salt meadows (saltmarsh)
Salicornia and other annuals colonising mud and sand (pioneer saltmarsh)
Sandbanks, which are slightly covered by seawater at all times
Sand dune Communities
Coastal Lagoons
Great crested Newt
Annex 1 species: Little Tern, Sandwich Tern, Common Tern, Arctic Tern, Bar-tailed Godwit, Golden Plover
Migratory species: Herring Gull, Lesser Black-backed Gull, Pink-footed Goose, Shelduck, Oystercatcher, Grey Plover, Knot, Dunlin, Pintail, Curlew, Redshank, Turnstone, Ringed Plover, Sanderling
Nationally important aggregations: Great-crested Grebe, Cormorant, Wigeon, Teal, Eider, Goldeneye, Red-breasted Merganser, Lapwing, Black-tailed Godwit
Qualifying Assemblages: Seabirds; Waterfowl

4.0 Is the proposal directly connected with or necessary to the management of the site for nature conservation?

No.

5.0 What potential hazards are likely to affect the interest features?
Refer to matrix below and only include those to which the interest features are sensitive

Are the interest features potentially exposed to the hazard?				
Site & designation	Interest feature	Interest sub-features	Potential hazard	Potential exposure to hazard and mechanism of effect/impact if known
Morecambe Bay SAC	Large shallow inlets and bays	Intertidal boulder and cobble skear communities (including mussel and *Sabellaria alveolata* communities)	Vehicular/ trampling damage	Although dominated by mussel cover and in very bad condition this year, the intertidal skear contains the most extensive *Sabellaria alveolata* reefs in the SAC. *Sabellaria* reefs are vulnerable to physical damage from vehicular activity and trampling. Mussels are a characteristic community of the intertidal skears. Access over mussel beds to access the seed mussels to be fished may result in loss, damage or dislodgement of mussels. **Likely significant effect**
		Intertidal boulder and cobble skear communities (including mussel and *Sabellaria* communities)	Physical removal of seed mussels	The proposal is to remove seed mussel from the intertidal skear. Mussel beds are a characteristic and fluctuating community of the intertidal boulder and cobble skear interest sub-feature. **Likely significant effect**
		Subtidal boulder and cobble skear communities	Vehicular / trampling damage	Interest feature is adjacent to intertidal areas to be fished. Seed mussel fishers do not require access to the subtidal areas and there is no potential exposure to hazard from hand-gatherers. Not significant
		Brittlestar bed communities intertidal boulder clay communities coastal lagoon	Vehicular/trampling damage Bycatch	Interest feature not located close to fishery or access routes Not significant

	communities		
Perennial vegetation of stony banks (vegetated shingle) Atlantic salt meadows (saltmarsh) Salicornia and other annuals colonising mud and sand (pioneer saltmarsh) Sandbanks, which are slightly covered by seawater at all times Various Sand dune Communities Great crested newt Coastal Lagoons		Vehicular/trampling damage	Interest feature not located close to fishery or access routes Not significant
Mudflats and sandflats that are not covered by seawater at low tide	Mud communities	Vehicular/trampling damage	Traditional access route to fishery crosses firm sand. Little or no exposure of mud communities to vehicular damage. Not significant
	Sand communities	Vehicular/ trampling damage	Traditional access route to fishery crosses firm sand. Potential for local compaction or rutting of sand by vehicular use but unlikely to be extensive or other than short term. Not significant
	Eelgrass beds	Vehicular/trampling damage	Interest feature not located close to fishery or access routes Not significant

	Estuaries		None additional to above	
	Reefs		None additional to intertidal cobble and boulder skears above	
Morecambe Bay SPA	Annex 1 species: Little Tern, Sandwich Tern, Common Tern, Arctic Tern, Bar-tailed Godwit, Golden Plover		Vehicular/human disturbance	Bar-tailed Godwit feed on muddy intertidal areas and are particularly vulnerable to disturbance. Any Bar-tailed Godwit feeding in proximity to the mussel skears may be subject to increased disturbance as a consequence of the proposed seed mussel harvesting and access to the beds. Disturbance may increase the energy consumption of migrating or wintering birds and reduce the feeding areas and food resource available to birds, affecting the condition of the birds and the condition of the site to support birds. **Likely significant effect**
	Migratory species: Herring Gull, Lesser Black-backed Gull, Pink-footed Goose, Shelduck, Oystercatcher, Grey Plover, Knot, Dunlin, Pintail, Curlew, Redshank, Turnstone, Ringed Plover, Sanderling		Vehicular/human disturbance	Birds feeding on the seed mussel beds proposed for harvesting, on the intertidal skear in the vicinity of these beds and along the access route to and from the seed mussel beds are likely to be exposed to disturbing activity. Disturbance may increase the energy consumption of migrating or wintering birds and reduce the feeding areas and food resource available to birds, affecting the condition of the birds and the condition of the site to support birds **Likely significant effect**
	Migratory species: Herring Gull, Lesser Black-backed Gull, Pink-footed Goose, Shelduck, Oystercatcher, Grey Plover, Knot, Dunlin, Pintail, Curlew, Redshank, Turnstone, Ringed Plover, Sanderling		Physical removal of seed mussels	The seed mussels on Heysham Flat Skear form a potential food resource for birds, particularly the oystercatcher, knot and herring gull. **Likely significant effect**

Nationally important aggregations: Great - crested grebe, cormorant, wigeon, teal, eider, goldeneye, red-breasted merganser, lapwing, black-tailed godwit		Physical removal of seed mussels	The mussels may be a potential food resource for eider, although the importance of this has yet to be established. A reduction in the availability of mussel could have an impact on the species. **Likely significant effect**
Qualifying Assemblages: Seabirds; Waterfowl		None additional to above	

6.0 Is the potential scale or magnitude of any effect likely to be significant?

a) Alone? Yes.

b) In combination with other plans or projects? Yes

The NWIFCA authorised a seed mussel dredge fishery in north Morecambe Bay in July and there is on-going hand-gathering of size mussel at Foulney, Morecambe Bay on low water tides. The in-combination effects need to be assessed on the SPA bird features identified.

Conclusion: Is the proposal likely to have a significant effect alone or in combination on a European site?

It is considered that the removal of seed mussel has the potential to have a significant effect on the Natura 2000 features noted above. An Appropriate Assessment of the proposal is therefore necessary before the proposed seed mussel harvesting can be permitted.

The assessment of likely significant effect of this proposal concluded a likely significant effect on the following features of interest in the Morecambe Bay SAC, SPA and Ramsar Site. These features will be the subject of this appropriate assessment.

Intertidal boulder and cobble skear communities (including mussel and *Sabellaria* communities)

Annex 1 species: Bar-tailed Godwit
Migratory species: Herring Gull, Lesser Black-backed Gull, Pink-footed Goose, Shelduck, Oystercatcher, Grey Plover, Knot, Dunlin, Pintail, Curlew, Redshank, Turnstone, Ringed Plover, Sanderling
Nationally important aggregations: Eider
Qualifying Assemblages: Seabirds; Waterfowl

Appropriate Assessment

The scope of the appropriate assessment was the following:

- Vehicular, trampling and fishing damage to:
  - *Sabellaria alveolata* reefs
- Vehicular/human disturbance to birds
- Physical removal of seed mussel

a) Vehicular, trampling and fishing damage to:

- *Sabellaria alveolata* reefs

Heysham Flat Skear contains biogenic reefs formed by the Honeycomb Worm, *Sabellaria alveolata*. This is an Annex I habitat that is present as a qualifying feature of the Morecambe Bay SAC. The main historic areas of *Sabellaria alveolata* reef are depicted on the accompanying map (Annex A), and in some years have been in healthy condition. This year however they are in a very poor and damaged state, due to mussel having persisted on them throughout the winter of 2014-15, subsequent heavy settlement of newly recruited mussel in spring 2015 and its associated dense layer of mussel mud, scouring over winter 2015-16, and another dense settlement in spring 2016.

The harvesting operation clearly has the potential to damage the reef when it is in healthy condition and reef structure below the surface layer. However discussion with Natural England over authorising hand-gathering from this area to help de-stabilise the mussel mud and provide improved conditions for 2016/17 worm recruitment, has led the NWIFCA to propose this course of action for this year. It is important to state that this would not be setting a precedent for future years; rather that each year should be considered and assessed depending on the state of the reef and mussel interaction at that time.

The proposed method of harvesting by hand rake and access over the reef by quad bike is unlikely to result in damage to the skear habitat, in that the fishery will open only after the mussel mud has built up and the mussel is sitting loosely on it. Raking only penetrates the top few centimetres of mud and does not impact on the cobble and boulder below. Quad bike tracks have the potential to dig deeper into the mud and even create ruts over time. This is considered to be more of a 'risk' to the reef. However, as stated above, the reef is in such poor condition and the worm, worm tubes and underlying reef structure so denigrated that the risk is considered negligible this year. The action of eroding the mud may have a beneficial impact on the worm reef for the next settlement. It is also known from many years of monitoring the skear that *Sabellaria alveolata* will settle on areas that have previously been over-ridden by quads in the fishery as it has previously extended across the skear out of the main historic reef area.

Consequently the NWIFCA considers that the harvesting of seed mussel from the Heysham Flat skears will not have an adverse effect on the integrity of the Sabellaria alveolata feature of the EMS.

b) Vehicular/human disturbance to birds

The harvesting of seed mussels and the access to and from the mussel beds has the potential to affect birds feeding on the mussel beds themselves, on other parts of Heysham Flat Skear, and on the intertidal sediments adjacent to the skear or access route.

Mussels are a key food resource for oystercatchers for which Heysham Flat is considered to be an important area. The harvesting operation has the potential to disturb oystercatchers feeding on the skear and to impair their feeding over fishable periods of low water. There is also potential for disturbance to other feeding wading birds.

The inspections of Heysham Flat skear indicate that fishing activity is likely over around 45 hectares of the bed on the majority of tides below around 1.7m, with an additional fishable area of 7ha only accessible on the largest spring tides for a narrow tidal window of around an hour. The total area of skear is estimated to be approximately 69 ha, much of it containing mussels so that an area of bed will always remain undisturbed and accessible to oystercatchers and other birds utilising the mussel seed (knot and herring gull). Knott End skear and the more westerly skears uncover about an hour and a half before low water on the large tides and will also provide an undisturbed resource for the birds during this time on all but the largest tides. Indeed, observations of bird activity made during surveys showed a preference for these outer skears, despite the presence of abundant mussel on the main skear.

Activity is likely to be focussed to the 'best' areas at any one time – ie. where the mussel is loosest and densest, and subsequently disturbance affects a relatively restricted area during the uncovering period. This potentially also leaves a large area higher up the skear available to birds feeding on the smaller mussel.

The harvesting and access operations may result in disturbance to bird species feeding on intertidal sediments. The sediments in this area are relatively sandy and observed to be of lower value to birds than muddy sediments elsewhere in the Bay, and therefore the likely effects are considered not significant. The location of the fishery centrally in the skear and the direct access route proposed between the skear and shore access will maximise the distance between sources of disturbance and the low water mark where potentially vulnerable birds such as bar-tailed godwit and curlew are most likely to be feeding.

The fishery is also restricted temporally to weekdays, thus reducing any potential impact of disturbance.

Consequently the NWIFCA considers that the harvesting of seed mussel from the Heysham Flat skears will not have an adverse effect on the integrity of the bird features of the EMS.

c) Physical removal of seed mussel

Mussel communities

The proposal is to gather seed mussels by hand from a skear which has been described as an ephemeral bed (Dare. 1976) that is habitually subject to extensive mussel settlement that is unstable, lying on soft mud and which recurrently gets scoured out by autumn / winter storms. This description has been borne out through a time series of survey work (MAFF and NW&NWSFC Surveys. 1968 – 2001. NWIFCA 2011 - 13). Experience over many years suggests that if left un-fished, some areas of the skear may be subject to rapid loss through erosion.

Site inspections and surveys have shown that across the whole main skear, and lower skears, the seed mussel is building up a considerable quantity of mussel mud, which is de-stabilising the bed. Some losses through erosion were apparent from these areas, with the mussels being stripped away, exposing the soft sediment beneath. In the denser areas, the mussels were loose, with no byssus. This is an indicator of stress and is frequently followed by high mortality.

NWIFCA Officers have records of the spatfall, growth and survival of mussels in this area in recent years. Annual spatfalls have regularly been heavy over the eastern half of Heysham Flat. Mortality of first-year mussels is usually very high, however. In many years, virtually the entire stock of mussels has been lost in the autumn and winter of their first year. Even when a proportion of the stock has survived this winter period, the relatively high tidal level has resulted in poor growth and continued high mortality, or as in 2015 and 2016 total inundation with a new settlement. It is anticipated that in the absence of the proposed harvesting of seed mussel, there will be a substantial scouring and loss of the seed mussels from Heysham Flat Skear.

Returns from the 2015 fishery show that around 700 tonnes were removed by Byelaw 3 permit holders. When taking into consideration to total stock on the bed, this equates to around 8 ha worth of stock. Also considering that the thinning effect of harvesting may help to stabilise the beds and provide a more suitable environment for some mussel to over-winter, the NWIFCA concludes that the physical removal by harvesting will not result in a significant difference in remaining stock than natural processes.

Consequently the NWIFCA considers that the harvesting of seed mussel from the Heysham Flat skears will not have an adverse effect on the integrity of the seed mussel feature of the EMS.

Birds – oystercatcher, knot, herring gull, eider

Young mussels are a key food resource for knot and oystercatchers in particular. However, the mussels that will be harvested are not attached to the hard substrate, and are already being lost through erosion. Observations over many years indicate that this process will accelerate through the autumn period, and that the harvestable stock may not persist, and will not remain available as prey for birds.

The simulated harvesting study conducted on Heysham Flat Skear in 2004 (Gascoigne et al. 2007) suggests that removal of the mussels from the denser areas is likely to reduce sediment accumulation and therefore increase the persistence of the remaining stock. It is possible that the total food supply available to oystercatchers over the winter period may be more likely to increase rather than decrease by the proposed harvesting. There are substantial areas of seed mussel on Heysham Flat Skear which will not be harvested and if natural events allow will remain as a potential food resource for oystercatchers.

Assessments of all the mussel beds within Morecambe Bay have been made to inform this HRA, and the likely impacts on bird prey resource. Details are given in section 1 above. The main alternative bed is Foulney with an estimated biomass of 5253 tonnes, and the area from Foulney to the oyster frames, estimated at 1.2km². Foulney is open as a size mussel fishery at the present time, but is unlikely to see much activity other than on the largest spring tides (for access to the mussel on the 'Island') as the majority of the mussel on the bed is undersize. The area between Foulney and the oyster frames sees a very low level of size mussel fishing throughout the year, particularly in the winter, with up to six hand-gatherers fishing it on the largest tides. The impact they have on the stock is minimal. This year there is mussel all along the low water line and up on the higher shore. The low water line is likely to see scouring and natural erosion.

Additional mussel resource is situated at Wyre End, and the Fleetwood beds of Neckings, Kings Scar and Rossall skears.

Hand-gathering is not 100% efficient and may even serve to thin out the mussel on the rest of the skear, improve the bed's stability and allow it to grow on. It has been assessed that 4000 tonnes of mussel is available in the main fishable area. The level of activity predicted (based on recent years fishing) indicates that only a proportion of this mussel will actually be fished (expected around 700 tonnes maximum from NWIFCA landings data).

Knott End skear and the further out skear will only see a limited amount of effort due to tidal restrictions and therefore the majority of this stock is likely to remain unfished and available as prey resource.

Consequently it is not considered that the harvesting of the seed mussels will affect the oystercatchers, knot or herring gull by reducing their food supply.

The extent to which eider feed on Heysham Flat Skear is unclear. There have been concerns about the eider population and its breeding success in Morecambe Bay, and in particular those nesting on Walney Island, although investigations into reasons for lack of breeding success are inconclusive. There are many potential contributory factors suggested for this decline including and significantly predation by land mammals. However, one factor identified by Natural England may be the removal of seed mussel, and this factor has been fully considered in undertaking this Appropriate Assessment.

Seed mussels may be a potential food resource for eider, although the importance of this has yet to be established - Goss-Custard *et al.* (2004) report that eiders mainly eat larger size mussels.

The removal of seed mussel through harvesting is similar to natural processes, as these mussels are a highly fluctuating resource.

The Heysham Flat mussel may be of lower value than the mussel beds around South Walney and Foulney Islands, which are the centre of the breeding colonies. The importance of Heysham may increase in winter, when the eider population in the Bay increases, although regular visits to the bed during the 2007/8 winter showed that oystercatchers and knot were utilising the area, but not so eider.

The Eider Risk Review was carried out by a joint agency working party. In her draft report Dr Liz Bailey from Natural England put forward the recommendation that the annual requirement of mussels for a population of 6000 eiders In Morecambe Bay is estimated at 657 tonnes as an absolute minimum, with an 8 fold multiplication as a precautionary measure to take other bivalve feeding species into account, giving a total of 5256 tonnes. The Risk Review highlighted that feeding eiders have been observed around the Bay, particularly near Fleetwood and regularly travel many kilometres to feed, with a hotspot around the north Morecambe Bay beds.

Consequently it is considered that harvesting of seed mussel from Heysham Flat skear will not adversely affect the eider interest feature by reducing their food supply.

<u>In-combination effects with seed mussel dredge fishery in north Morecambe Bay:</u>

i) Removal of bird feeding resource:

A seed mussel dredge fishery has been authorised in north Morecambe Bay and has undergone a separate Habitats Regulations Assessment. The seed mussel there was being heavily predated on by starfish. Historical records and more recent observations confirm that vast swathes of seed mussel are wiped out by immense numbers of starfish in short periods of time. This mussel supply would be lost to the birds as a feeding resource by natural processes were it not to be fished.

Large areas of mussel resource in Morecambe Bay will remain for the birds, especially the areas on Foulney, where only a low level of size mussel fishing is authorised, between Foulney and the oyster frames (around 1.2km^2) and the majority of the stock at Heysham Flat, where only a maximum of 700 tonnes is anticipated to be removed from the main skear by hand-gathering. This mussel is likely to be lost to natural erosion by autumn / winter storms.

Alternative feeding stock is also situated at Wyre End and the Fleetwood beds.

ii) Disturbance to mussel feeding birds – knot, oystercatcher, herring gull and eider.

Heysham Flat is not considered a prime area for eider and therefore the likelihood of disturbance is very low.

Other mussel areas in Morecambe Bay will be available and not be fished and provide non-disturbed areas for knot, oystercatcher and herring gull.

Management:

Hand-gatherers will be required to submit weekly catch returns and fishing will be monitored and policed by NWIFCA officers to ensure it is conducted according to the conditions within the authorisation. 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.

NWIFCA believes that the fishing that will take place under this proposal is of a nature that is analogous to the natural processes that will inevitably result in large losses of mussels from these settlements. In view of this and the controls implemented, we conclude that there will be no risk of adverse effect on the integrity or conservation status of the SAC or SPA features of Morecambe Bay and the Duddon Estuary.

Appropriate assessment – summary table

Hazard	Interest feature	Favourable condition target for relevant attribute (including range of natural variation) based on conservation objectives	Adverse effect of proposal alone on attribute and/or feature	Adverse effect of proposal in combination with other plans or projects, on attribute and /or feature	Can adverse effects be avoided?	Adverse effect on integrity; (yes, no or uncertain

Vehicle & trampling damage	Intertidal boulder and cobble skear communities (including mussel and *Sabellaria alveolata* communities)	No decrease in extent, distribution and quality of *Sabellaria alveolata* reefs from established baseline (Woombs 1997), subject to natural change.	*Sabellaria alveolata* reef in such poor condition and worm, worm tubes and underlying reef structure so denigrated that 'risk' is considered negligible this year. The action of eroding the mud may have beneficial impact on worm reef for next settlement. Fishers take direct route to fishery. Limited number of fishers and quad bikes. Area is highly dynamic and is fished most years. Unlikely risk to cobble and boulder skear communities.	No other activity anticipated to cause in-combination effect.	No mitigation required	No

Physical removal of seed mussels	Intertidal boulder and cobble skear communities (including mussel and *Sabellaria alveolata* communities)	Mussels are loose and unembyssed on deep layer of soft mud and are subject to potentially catastrophic loss by tidal scour. Harvesting of mussels is therefore similar to natural processes.	Seed mussel is likely to be lost by end of November through natural processes. Harvesting the seed mussel will not have an adverse effect on the mussel beds.	No in-combination effect assessed as mussel likely to be lost by end of November through natural processes.	No mitigation required	No
Disturbance	Annex 1 species: Little Tern, Sandwich Tern, Common Tern, Arctic Tern, Bar-tailed Godwit, Golden Plover	No decrease in extent of skears (as important feeding areas) from established baseline, subject to natural change.	Potential risk of disturbance to bar tailed godwit and golden plover. Risk can be reduced to negligible or very slight by reducing the area exposed to disturbance at Heysham Skear, within the context of a very large SPA. Disturbance will also be of a short duration and reversible.	No other activity anticipated to cause in-combination effect.	Yes. By conditions in the authorisation to: restrict the times the fishery will be open; restrict access from shore to a route that minimises travel distance, runs over sandier sediments and maximises distance between it and the low water mark when harvesting operations are being undertaken. .	No
Disturbance	Migratory species: Herring Gull, Lesser Black-backed Gull,	No decrease in extent of skears (as important feeding areas) from established	Potential risk of disturbance to several wader species. Risk can be reduced to	Seed mussel dredge fishery in north Morecambe Bay. Other mussel areas in	Yes. By conditions in the authorisation to: restrict the times the fishery will be open;	No

	Pink-footed Goose, Shelduck, Oystercatcher, Grey Plover, Knot, Dunlin, Pintail, Curlew, Redshank, Turnstone, Ringed Plover, Sanderling	baseline, subject to natural change.	negligible or very slight by reducing the area exposed to disturbance at Heysham Skear, within the context of a very large SPA. Disturbance will also be of a short duration and reversible.	Morecambe Bay will be available and not be fished and provide non-disturbed areas for knot, oystercatcher and herring gull.	Other mussel areas in Morecambe Bay will be available and not be fished. The lower skears will uncover before they can be accessed and on tides when they cannot be accessed, providing an undisturbed area for mussel eating birds.	
Disturbance	Nationally important aggregations: Great -crested grebe, cormorant, wigeon, teal, eider, goldeneye, red-breasted merganser, lapwing, black-tailed godwit	No decrease in extent of skears (as important feeding areas) from established baseline, subject to natural change.	Potential risk of disturbance to several wader species. Risk can be reduced to negligible or very slight by reducing the area exposed to disturbance at Heysham Skear, within the context of a very large SPA. Disturbance will also be of a short duration and reversible.	No other fishery anticipated to cause in-combination effect. Heysham Flat is not considered to be a prime area for eiders.	Yes. By conditions in the authorisation to: restrict the times the fishery will be open; restrict access from shore to a route that minimises travel distance, runs over sandier sediments and maximises distance between it and the low water mark when harvesting operations are being undertaken;	No
Physical removal of seed mussels	Migratory species: Herring Gull, Lesser Black-backed Gull, Pink-footed Goose, Shelduck, Oystercatcher, Grey Plover,	Presence and abundance of prey species (including mussels) should not deviate from an established baseline, subject to natural change.	The seed mussels to be harvested are likely to be lost to birds within the next few weeks. Thinning of seed mussels may enhance the survival of a proportion of the	Seed mussel dredge fishery in north Morecambe Bay where seed mussel resource is being heavily predated on by starfish and therefore would be removed by natural	Other mussel areas in Morecambe Bay will be available and not be fished and sufficient resource will still be available	No

	Knot, Dunlin, Pintail, Curlew, Redshank, Turnstone, Ringed Plover, Sanderling		mussels. There is no baseline of seed mussel as it is subject to natural variation and does not persist.	processes if fishing were not authorised and lost to birds.		
Physical removal of seed mussels	Nationally important aggregations: Great -crested grebe, cormorant, wigeon, teal, eider, goldeneye, red-breasted merganser, lapwing, black-tailed godwit	Presence and abundance of prey species (including mussels) should not deviate from an established baseline, subject to natural change.	The seed mussels to be harvested are likely to be lost to birds within the next few weeks. Thinning of seed mussels may enhance the survival of a proportion of the mussels.	Seed mussel dredge fishery in north Morecambe Bay where seed mussel resource is being heavily predated on by starfish and therefore would be removed by natural processes if fishing were not authorised and lost to birds.	Other mussel areas in Morecambe Bay will be available and not be fished.	No

Can it be ascertained that the plan or project will not adversely affect the integrity of the European Site?
Yes.

The NWIFCA considers that the proposed harvesting of seed mussel from Heysham Flat Skear has the potential for a likely significant effect on the conservation features and associated habitats of the Morecambe Bay SAC, SPA and Ramsar Site.

However, the NWIFCA concludes that with the proposed mitigation measures in place there will be no adverse effect on the integrity of the Morecambe Bay SAC, SPA and Ramsar site. The management measures described above have been implemented over the past few years and have proved to be successful in permitting the fishery. They have been adapted this year with advice from Natural England regarding the condition of the *Sabellaria alveolata* reef.

MANDY KNOTT
NWIFCA Senior Scientist

22nd July 2016

Additional Note: despite the excellent work carried out during the Eider Risk Review many questions still remain around the eider population of Morecambe Bay, reasons for the apparent decline in its breeding success, predation pressures, feeding preferences and relation to the mussel fisheries. Shellfish harvesting is an important economic activity in the Bay and many of these questions have been circulating around the fisheries for many years. The NWIFCA fully supports the proposals for a full-time 3 year PhD studentship as a cost-effective way to attaining a more in-depth understanding of these issues and ideally to provide some conclusive research so that a consensus can be reached. This would facilitate a faster, more efficient Appropriate Assessment for each year's fishery.

Final Appropriate Assessment Record

This is a record of the appropriate assessment required by Regulation 61 of the Conservation of Habitats and Species Regulations 2010, undertaken by the NWIFCA in respect of the above application, in accordance with the Habitats Directive (Council Directive 92/43/EEC).

Having considered that the application would be likely to have a significant effect on the Morecambe Bay SAC, SPA and Ramsar Site and that the application was not directly connected with or necessary to the management of the site for nature conservation, an Appropriate Assessment has been undertaken of the implications of the proposal in view of the site's conservation objectives.

Natural England was consulted under Regulation 61. The conclusions of this appropriate assessment are in accordance with the advice and recommendations of NE.

The assessment has concluded that the plan or project as proposed has the potential for a likely significant effect on the conservation features and associated habitats of the Morecambe Bay SAC, SPA and Ramsar Site. The imposition of conditions or restrictions on the way the proposal is to be carried out has been considered and it is ascertained that the following conditions and/or restrictions would avoid adverse effects on the integrity of the site

The period of the authorisation does not extend beyond the end of December 2016.
The mussels shall only be gathered by hand or using a rake.
The NWIFCA includes notice to authorisation holders that damage to the reefs could lead to prosecution by Natural England under the Countryside and Rights of Way Act.
The accepted access to Heysham Flat Skear is from the Battery car park.
The fishery will be restricted to daylight hours, Monday to Friday only.
The NWIFCA will close the fishery during periods of prolonged cold weather.
The NWIFCA retain the power to revoke the authorisation for environmental reasons if Natural England advise that the activity may have adverse effects on those sites.

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Date: 18 July 2016
Our ref: 189656
Your ref: Seed Mussel Fishery Heysham Flat, Morecambe Bay

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BY EMAIL ONLY

Dear Mandy

Seed Mussel Fishery Heysham Flat, Morecambe Bay

Thank you for your consultation on the above which was received by Natural England on 28 June 2016.

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 potential SPA (pSPA) and the Morecambe Bay Special Area of Conservation (SAC) which are European sites. The site is also listed as Morecambe Bay Ramsar site[1] 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[2]. The Conservation objectives for each European site explain how the site should be restored and/or maintained and may be helpful in assessing what, if any, potential impacts a plan or project may have.

No objection

Natural England notes that your authority, as competent authority under the provisions of the

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

[2] 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. The Government has produced core guidance for competent authorities and developers to assist with the Habitats Regulations Assessment process. This can be found on the Defra website.
http://www.defra.gov.uk/habitats-review/implementation/process-guidance/guidance/sites/

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 in close proximity to 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(I) of the *Wildlife and Countryside Act 1981* (as amended), requiring your authority to re-consult Natural England.

DETAILED COMMENTS

The Habitats Regulations Assessment (HRA) does not make use of or mention of the bird food requirement model provided by NE to NWIFCA on 13th May. Although it is accepted that the mussel resource on the Heysham Flat bed is likely to change, the assessment should ensure that there is sufficient mussel stock available in the Morecambe/Heysham area of the Bay to meet the predicted needs of oystercatcher and knot (2743 tonnes in total). This is based on 3 Heysham WeBS sectors (Heysham, Morecambe Stone Jetty and Morecambe Prom)

- Mean of the peaks over 5-year period 2009/2010 – 2013/2014 for oystercatcher 8,107 birds which have an ecological requirement of 2,396 tonnes based on model
- Mean 5 year peak is 2009/2010 – 2013/2014 for knot -13,803 birds which have an ecological requirement of 347 tonnes based on model.
- Herring gull are also known to utilise mussel beds as they are omnivorous and gulls that remain over winter will also make use of these beds.
-

Due to the nature of the *Sabellaria* (Honeycomb worm) reef and the potential for resettlement on old, 3D reef structures we would advise that a survey of the site should be conducted prior to the start of the opening of the fishery. Should substantial areas of live worm reef structures or of exposed old worm reef be identified, both of which could facilitate development of more extensive *Sabellaria* reef structures, these should be demarcated and access to them restricted. We advise that the site is monitored as the fishery progresses to review the effectiveness of these demarcated areas in protecting the *Sabellaria* and identify whether any changes in management measures, including changes in demarcated areas, are needed.

No total allowable catch (TAC) has been proposed however the proposed authorisation states: "the fishery may be closed with immediate effect by the NWIFCA if in the opinion of NWIFCA Officers or Scientists, there is a failure to comply with these conditions or there is damage to the beds through over-fishing". In the absence of a TAC it is suggested that if

catch returns exceed that of the 2015 fishery (700 tonnes) then the HRA and fishery should be reviewed to identify whether additional management action needs to be taken in order to prevent damage through over-fishing.

In other HRAs (eg North Morecambe Bay Dredge Fishery, July 2016) North Western IFCA has stated that it would be able to close the fisheries should fisheries or natural mortality result in mussel stocks declining to levels at which the ability of SPA bird species to meet their feeding requirements could be compromised. We advise that a similar mitigation measure should be included in any authorisation for the proposed fishery with appropriate monitoring put in place that would trigger implementation of this measure.

Yours sincerely

Helen Ake
Lead Adviser – Cumbria Area Team

Update – 25th July 2016

Following receival of Natural England's formal conservation advice on 21st June 2016, NWIFCA Science Officers revisited the skear to carry out a rapid survey on the main *Sabellaria alveolata* reef area based on the established survey methodology that evening with representation from Natural England (Dr Emily Hardman) and Cumbria Wildlife Trust (Dr Emily Baxter). The access by foot proved to be hazardous in the loose mud and only a partial survey could be carried out due to time constraints. The results of this survey are presented in Fig. 16 and Fig 17. below.

Discussion around the meaning of the advice resulted in the NWIFCA revising the proposal and re-instating the exclusion zone to protect the main area of the reef and to include a small area of live worms currently positioned to the north of the main mussel area. This has been included along with mapping in the authorisation, and has been physically staked out on the mussel bed.

It was clarified that the conservation advice required the main area of reef to be protected regardless of there being any live structures present, and that the underlying dead worm tubes – the 3D structures referred to in the advice – also needed to be protected to provide the basis of a reef area to aid future recruitment in order for the fishery to be Habitats Regulations compliant.

Conservation advice regarding bird feeding requirements and setting of a TAC will be discussed further with Natural England. The NWIFCA is confident at the date of opening the fishery that there is an ample stock of undersize mussel in Morecambe Bay to ensure compliance of the fishery to the Habitats Regulations in relation to bird feeding requirements, including in-combination with other fisheries. This situation will be monitored and the fishery closed should concerns be raised over losses of stock due to erosion and natural processes as the year progresses. This has been written into the authorisation (Annex A).

Fig. 16. The survey grid for the Heysham Flat *Sabellaria alveolata* historic demarcation zone with the substrate (% cover) results from the rapid survey conducted on 21-07-16. Only positions exhibiting a pie chart were surveyed. NB. Red denotes the presence of *S. alveolata* reef structure only, live worms were not seen at these positions

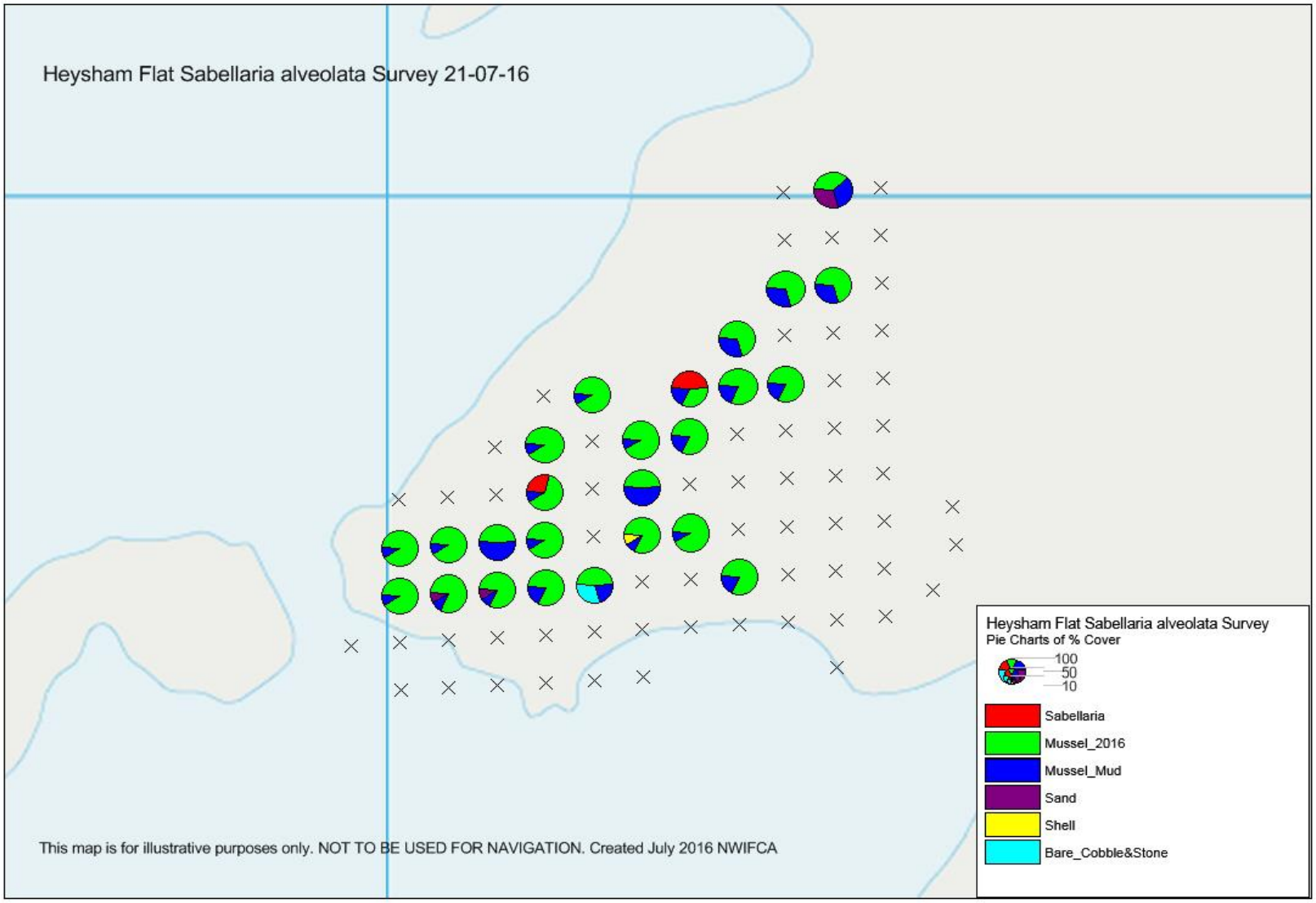
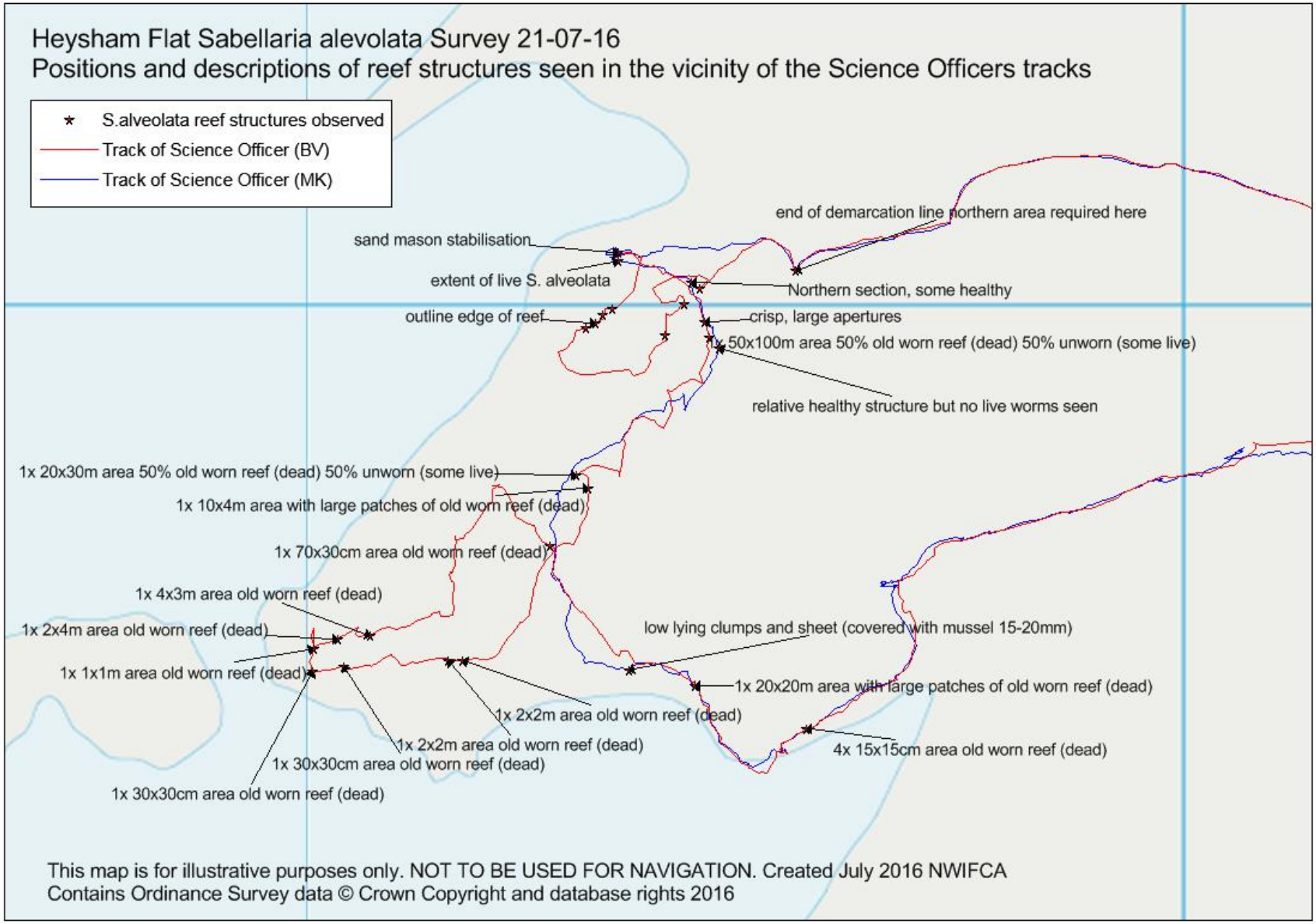


Fig. 17 Positions and descriptions of *Sabellaria alveolata* reef structures observed during the rapid survey at Heysham Flat on 21-07-16.



Annex A

North Western IFCA
Inshore Fisheries and Conservation Authority

AUTHORISATION TO REMOVE UNDERSIZED MUSSELS FROM HEYSHAM FLAT SKEAR 2016

All Current NWIFCA Byelaw 3 Permit Holders **With effect from 25/07/16**

Issue Date: **22/07/16** **Expiry Date:** **16/12/2016**

All current Byelaw 3 permit holders are hereby authorised, under Byelaw 3, section 6 (Minimum Sizes) to remove undersized mussels (for use as seed) in the area defined at paragraph 2 below, and is 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 the issue date to the expiry date as stated above, ***excluding Bank Holiday Monday 29th August 2016***.

(b) That the mussels shall only be gathered by hand or with a rake.

(c) That fishing shall take place only from Monday to Friday inclusive, during daylight hours.

(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) All Byelaw 3 permit holders shall submit to the Authority details of mussels taken, including nil returns, on the standard returns form no later than the 5th day of every month following fishing.

(g) 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.

(h) Any fishing taking place under this authorisation shall be carried out in accordance with the Authority's Code of Conduct for Intertidal Shellfisheries.

*revised co-ordinates 25/07/2016 due to typing error for position 'H' Big Stone, all other co-ordinates unchanged

2. Definition of Area

Part of that area within Morecambe Bay known as Heysham Flat Skear as illustrated on the map attached at Annex A, ***excluding*** the area bound by the following co-ordinates:

ID	Lat	Long	Lat	Long	
A	54.061488	-2.907935	54 03.689N	2 54.476W	
B	54.058900	-2.909545	54 03.534N	2 54.573W	
C	54.058330	-2.912200	54 03.500N	2 54.732W	
D	54.057012	-2.919268	54 03.421N	2 55.156W	
E	54.052900	-2.917241	54 03.174N	2 55.034W	
F	54.054450	-2.906557	54 03.267N	2 54.393W	
G	54.057052	-2.902889	54 03.423N	2 54.173W	
H (*revised)	54.056080	-2.911510	54 03.365N	2 54.691W	Big Stone

3. Advisory Notes

(a) When fishing, or when operating vehicles in the vicinity of Heysham Flat Skear, take care to avoid live colonies of the Honeycomb Worm. These are a protected species, and damaging them could lead to a fine of up to £20,000, revoking of authorisations and **closure of the fishery**.

(b) 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.

(c) Avoid driving vehicles over the seed mussels as far as possible. Using a single access route will avoid unnecessary damage to the mussel stock.

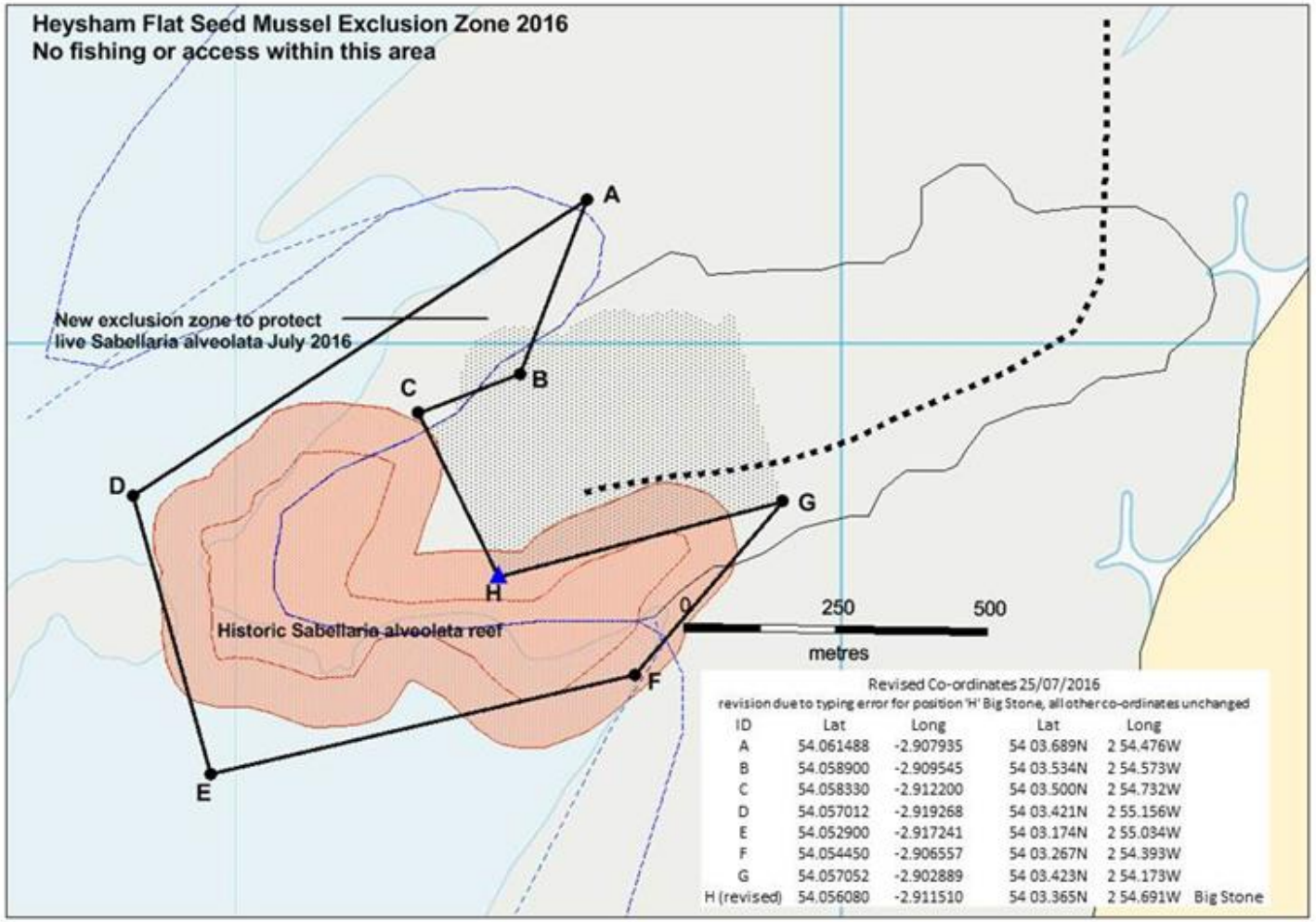
This authorisation may be revoked by the NWIFCA at any time and any breach of the terms or conditions of this authorisation shall make it null and void.

By Order of the Authority

STEPHEN ATKINS
Chief Executive

*revised co-ordinates 25/07/2016 due to typing error for position 'H' Big Stone, all other co-ordinates unchanged

Annex A



Revised Co-ordinates 25/07/2016
revision due to typing error for position 'H' Big Stone, all other co-ordinates unchanged

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