Morecambe Bay Cockle Fisheries Habitats Regulations Assessment 1st September 2019 - 30th April 2020

Introduction

There is a long history of management of hand-gathered cockle fisheries in Morecambe Bay and specifically on Flookburgh / Leven Sands, Newbiggin and Pilling cockle beds. The NWIFCA has carried out Habitats Regulations Assessments for these fisheries each time they have been opened since 2016. The most recent HRAs are available on the NWIFCA website: https://www.nw-ifca.gov.uk/marine-protected-areas/hra/ These contain lengthy detail about the nature of the fisheries, the variability of the stock, the conservation features for which the site is designated, their conservation status, the potential risks fishing activity could pose to the features, along with detail on potential impacts, vulnerability, and features' exposure to pressures. Finally the HRAs contain detail of the management (byelaws, and specific measures for each year depending on circumstances of the management and the stock) to ensure no risk to the integrity of the European Site.

Considering the history of these fisheries there seems little point in producing a lengthy document which repeats the information contained in previous versions. The NWIFCA has taken the approach to summarise the factors that have changed since the opening of the fishery in January 2019, and carry out an Appropriate Assessment on these. This is provided in concise format below.

Please refer to the HRA for these cockle fisheries carried out for 2017 for the most up-to-date detailed information on all factors that are not covered in this document: **NWIFCA-MB-EMS-2017.** The HRA carried out for the October 2018 fishery **Leven and Flookburgh 2018** and the January 2019 fishery **Morecambe Bay Cockle Fisheries January 2019** is also available. Both can be found at: https://www.nw-ifca.gov.uk/marine-protected-areas/hra/

1. Change to Site Information

Addition of Wyre – Lune Marine Conservation Zone (MCZ). The site is designated for smelt (*Osmerus eperlanus*). The Pilling cockle bed is within the MCZ but due to the nature of the activity (intertidal hand-gathered cockle fisheries) it is extremely unlikely that there will be any impact on smelt from the fishery.

Updated conservation advice for Morecambe Bay and Duddon Estuary SPA. Changes specific to the HRA;-

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

2. Information about the fishing activity within the site

Regulation of Hand-gathering – change in number of permit holders

There are currently a maximum of 136 NWIFCA Byelaw 3 permits which could be issued for the 2019 – 2020 season (correct 29-07-19).

NWIFCA are currently in the process of consulting on NWIFCA Byelaw 3 (2019) which if it comes into force during the 2019 – 2020 fishery will replace the current management. There are no changes in the byelaw that need to be considered in the HRA as the byelaw will build on and improve the current ability to management the fishery.

3. Current Status of main Cockle Stocks within Morecambe Bay

For all surveys:

Means were calculated from all stations with zero counts on the edges of the bed removed. Less than 5mm cockle was not used in the undersize figures due to the high variable survivability of cockle at this small size but has been included as a separate figure.

Maps were created showing the overall survey area, density of size cockle, density of undersize cockle (excluding cockles in the 0-5mm size range) and the frequency of size classes (pie charts show the frequency of different size classes, the size of the pie chart indicates the total density of cockles present).

For biomass calculations - size cockle is defined as cockle which will not pass through a square gauge 20 x 20mm in size. The biomass of undersize cockle does not include any estimates of cockle less than 5mm due to the high variability of survival of this size class.

Middleton Cockle Survey 05-06-19

Tides: LW 07:52 1.2m (Liverpool tides)

Survey method - Jumbo and 0.5m^2 quadrat

49 stations were sampled from a 250m grid. 4 additional stations were added to ensure full coverage. The density of size cockle across the bed was relatively low and the small area of high density size cockle in 2018 was no longer present. Some undersize cockle persisted from last year but not in significant densities. There were no signs of a 2019 cockle settlement but this is to be expected due to the time of year.

Mean number of size cockle	7 per m^2	(min 0, max 52)
Mean number of undersize cockle	17 per m^2	(min 0, max 142)
Mean number of 0-5mm cockle	0 per m^2	(min 0, max 0)

	Area (ha)	Size Cockle (tonnes)[1]	Undersize Cockle (tonnes)
Middleton Sands	**461**	**~300-350**	**~80-100**

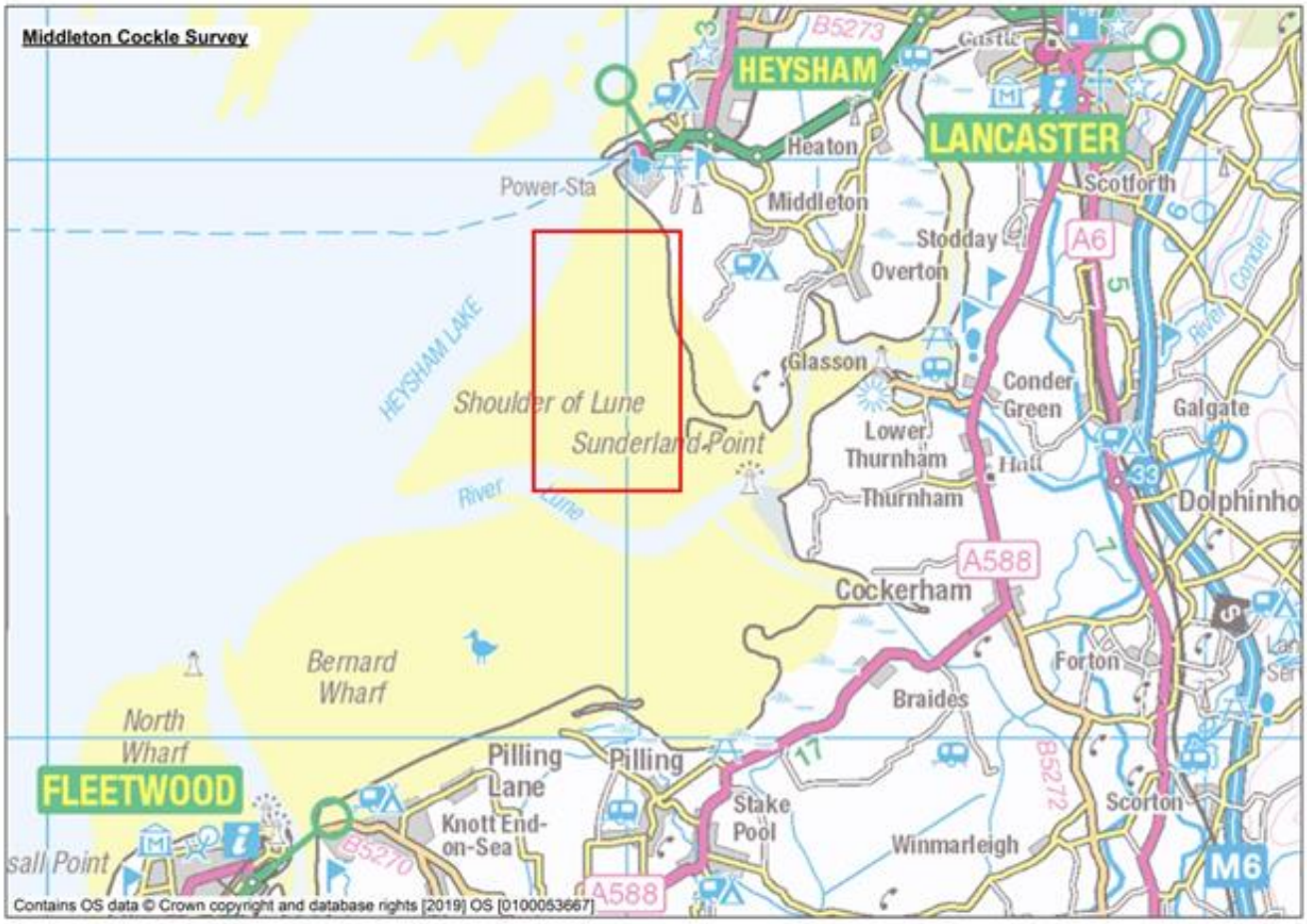
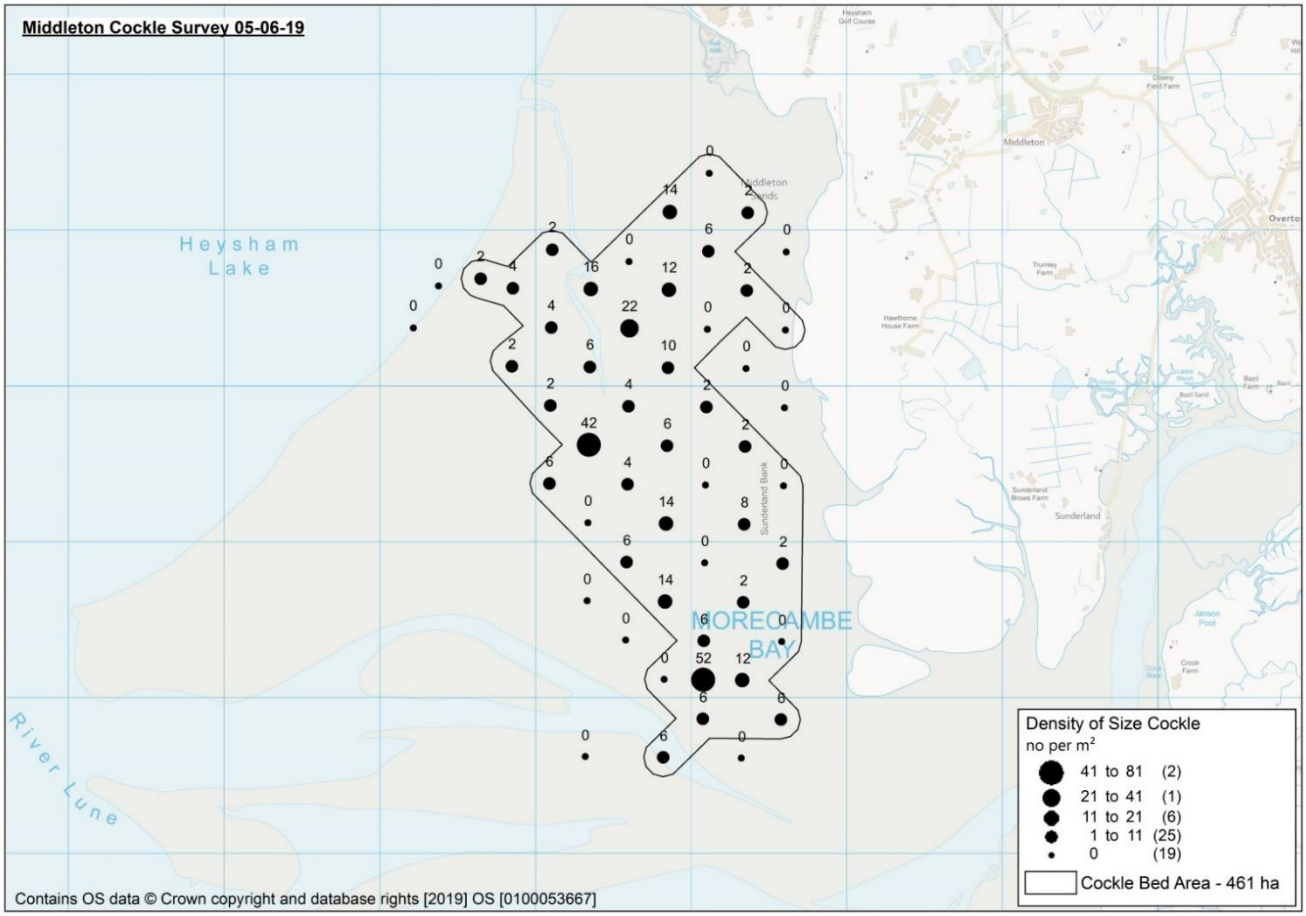
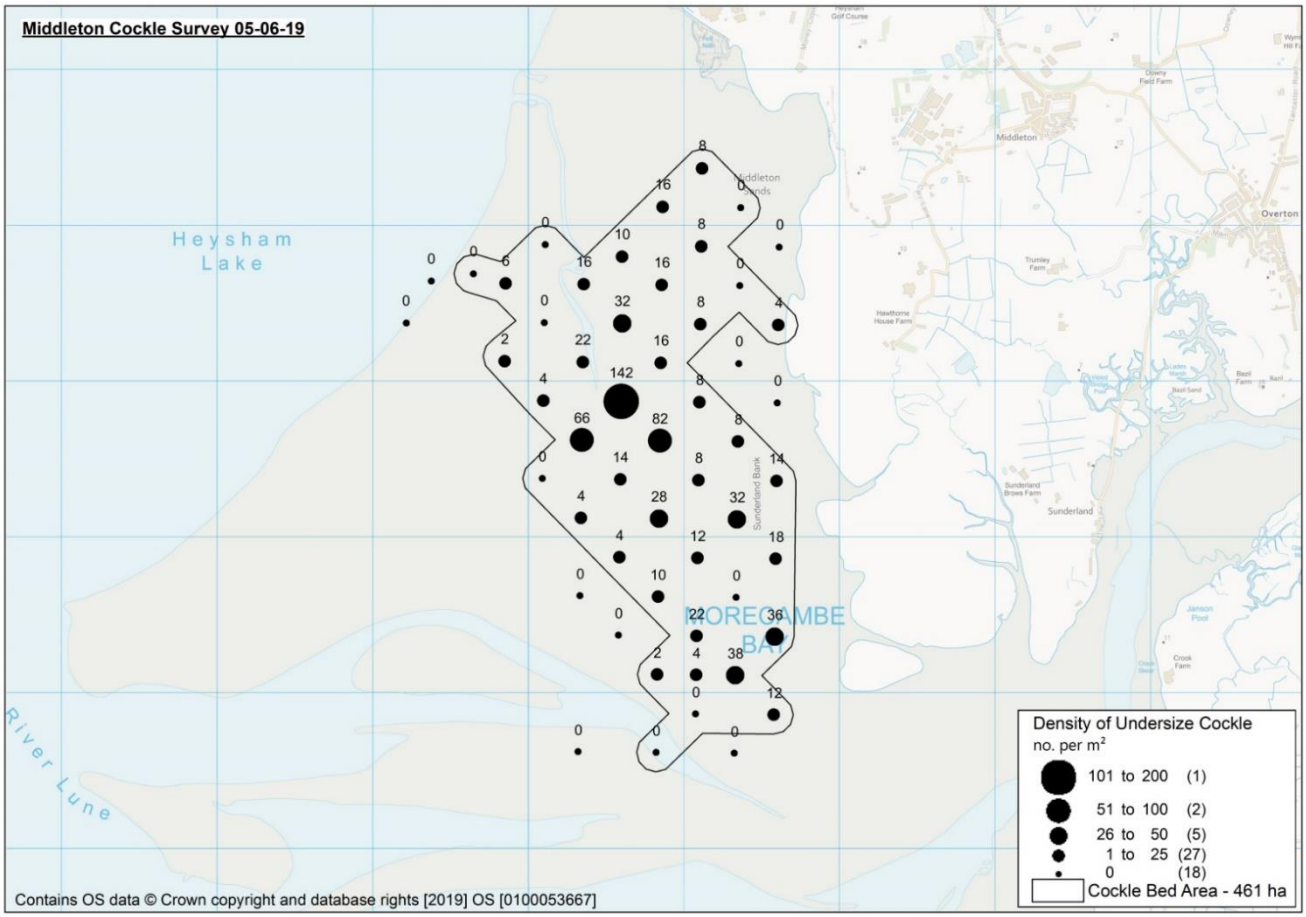


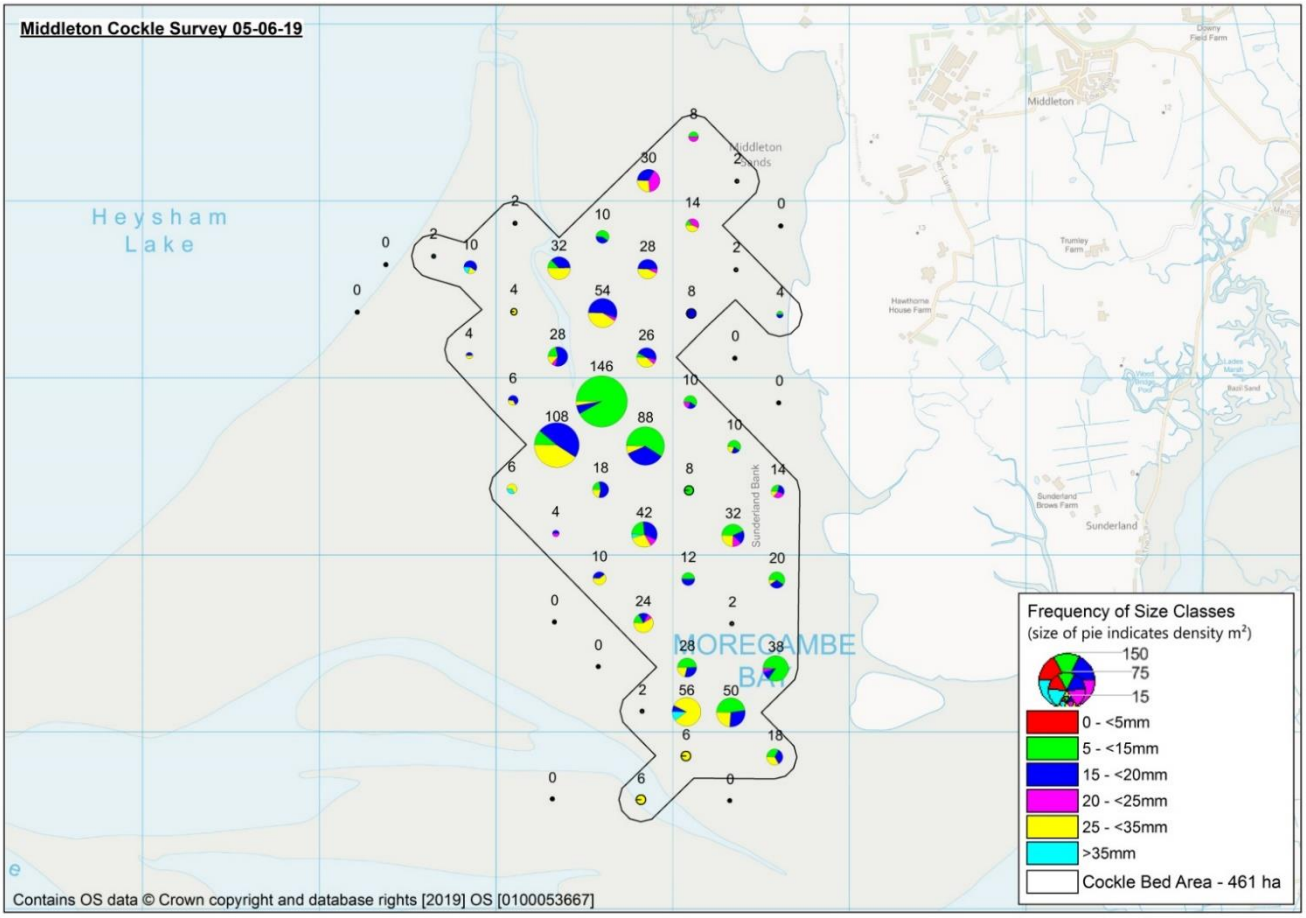
Illustration of position of Middleton Sands cockle bed



Density of size cockle per m² Middleton Sands June 2019



Density of undersize cockle per m² Middleton Sands June 2019



Frequency of size classes of cockle per m² Middleton Sands June 2019

Warton Sands Cockle Survey 06-06-19

Tides: LW 08:35 1.2m (Liverpool tides)

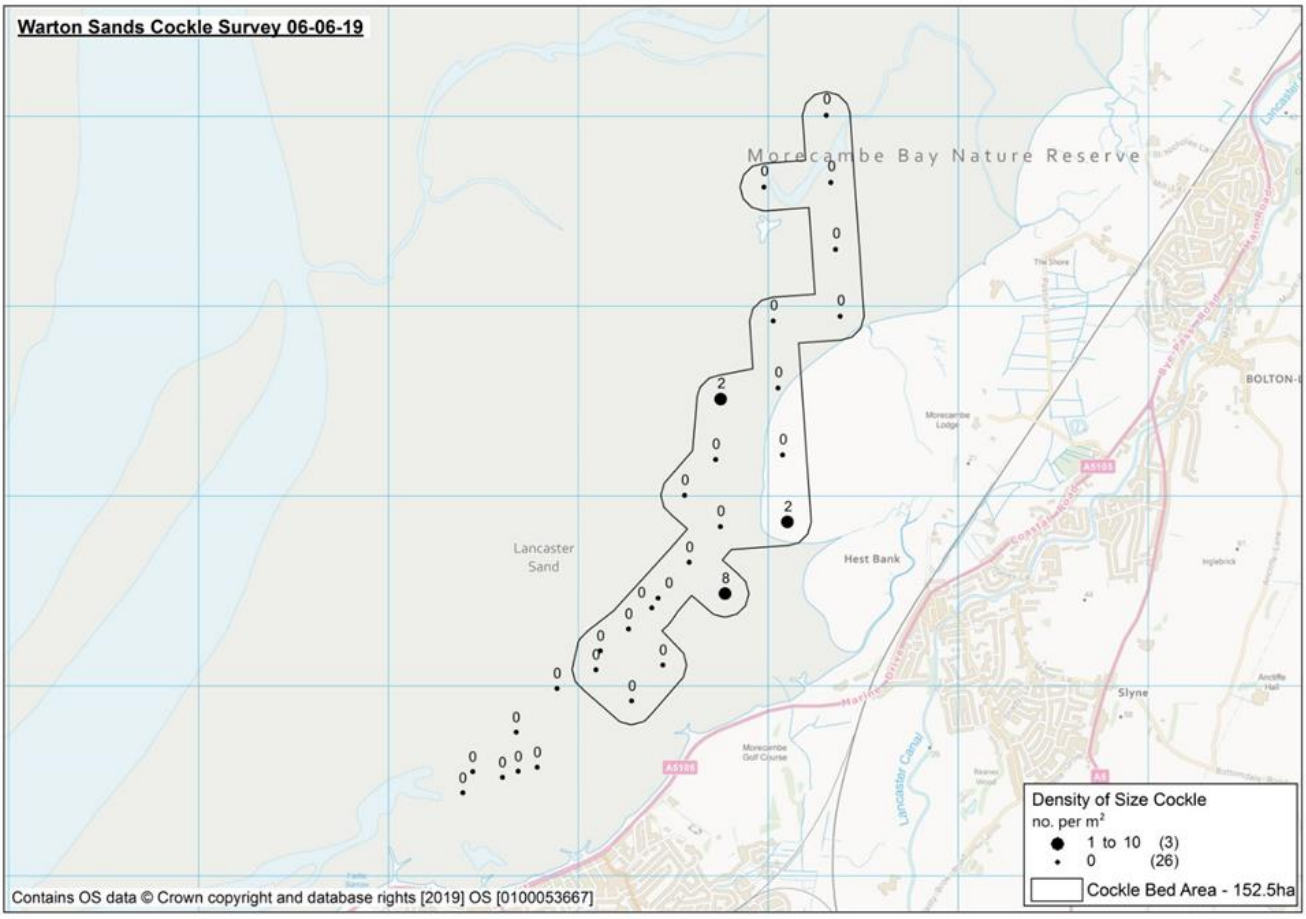
Survey method - Jumbo and 0.5m² or 0.1m² quadrat and sieve depending on cockle densities.

19 survey stations were sampled from a 250m grid with an additional 10 stations added to areas which could be accessed. Due to channels and very soft ground many of the survey stations from the grid could not be sampled. The density of size cockle across the bed was very low with only a couple of stations containing size cockle. There was a muddy band running parallel with the shore that contained a significant amount of undersize cockle in the 15-20mm size class. There were no signs of a 2019 cockle settlement but this is to be expected due to the time of year. There was a small area in the south of the survey area across a channel that contained low numbers of cockle but because it was only in low densities and away from the main area it has not been included in the means or biomass figures.

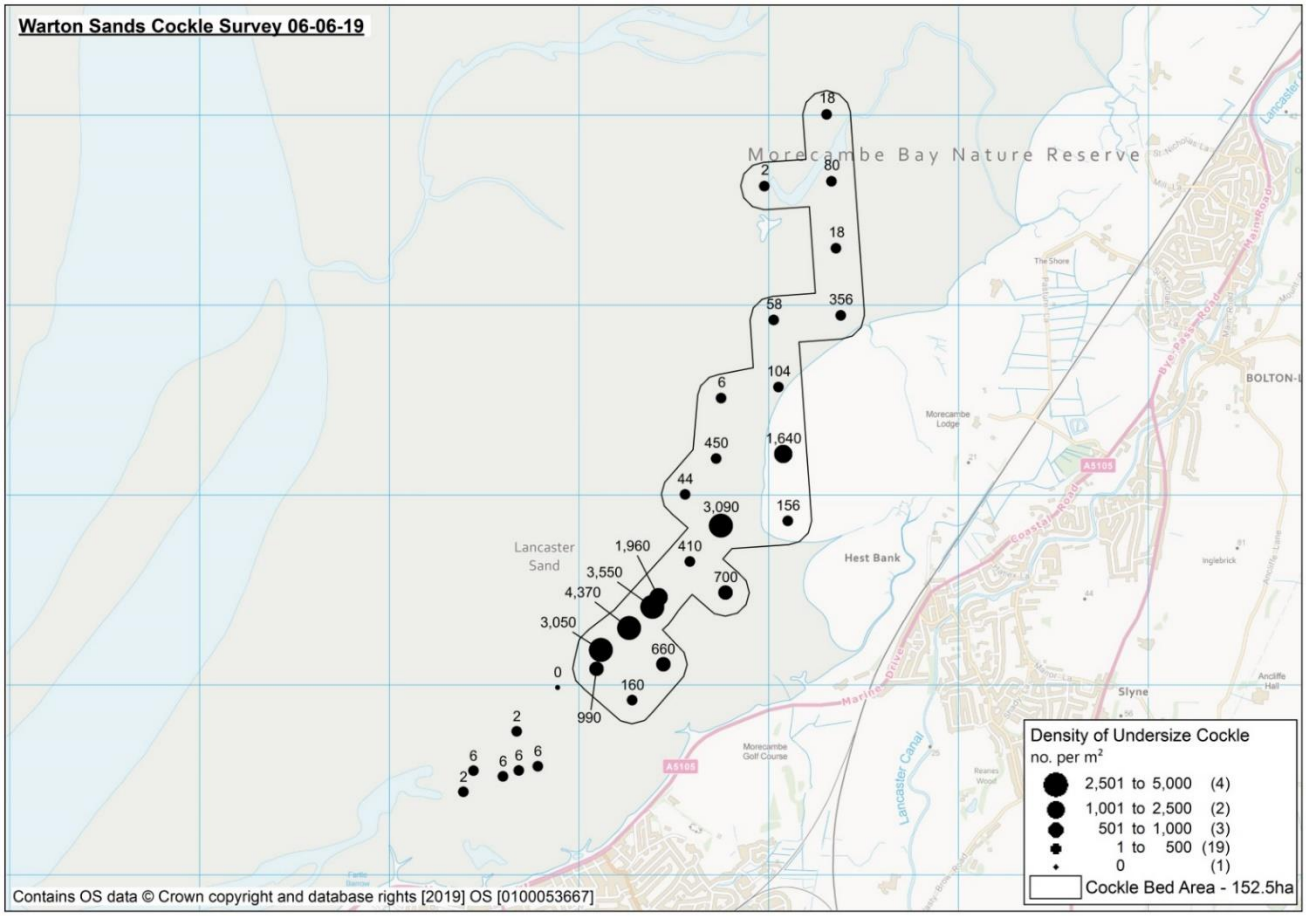
Mean number of size cockle	<1 per m²	(min 0, max 8)
Mean number of undersize cockle	994 per m²	(min 2, max 4370)
Mean number of 0-5mm cockle	0 per m²	(min 0, max 0)

	Area (ha)	Size Cockle (tonnes)[1]	Undersize Cockle (tonnes)
Warton Sands Dense Area	**152.5**	**<10**	**~2300**

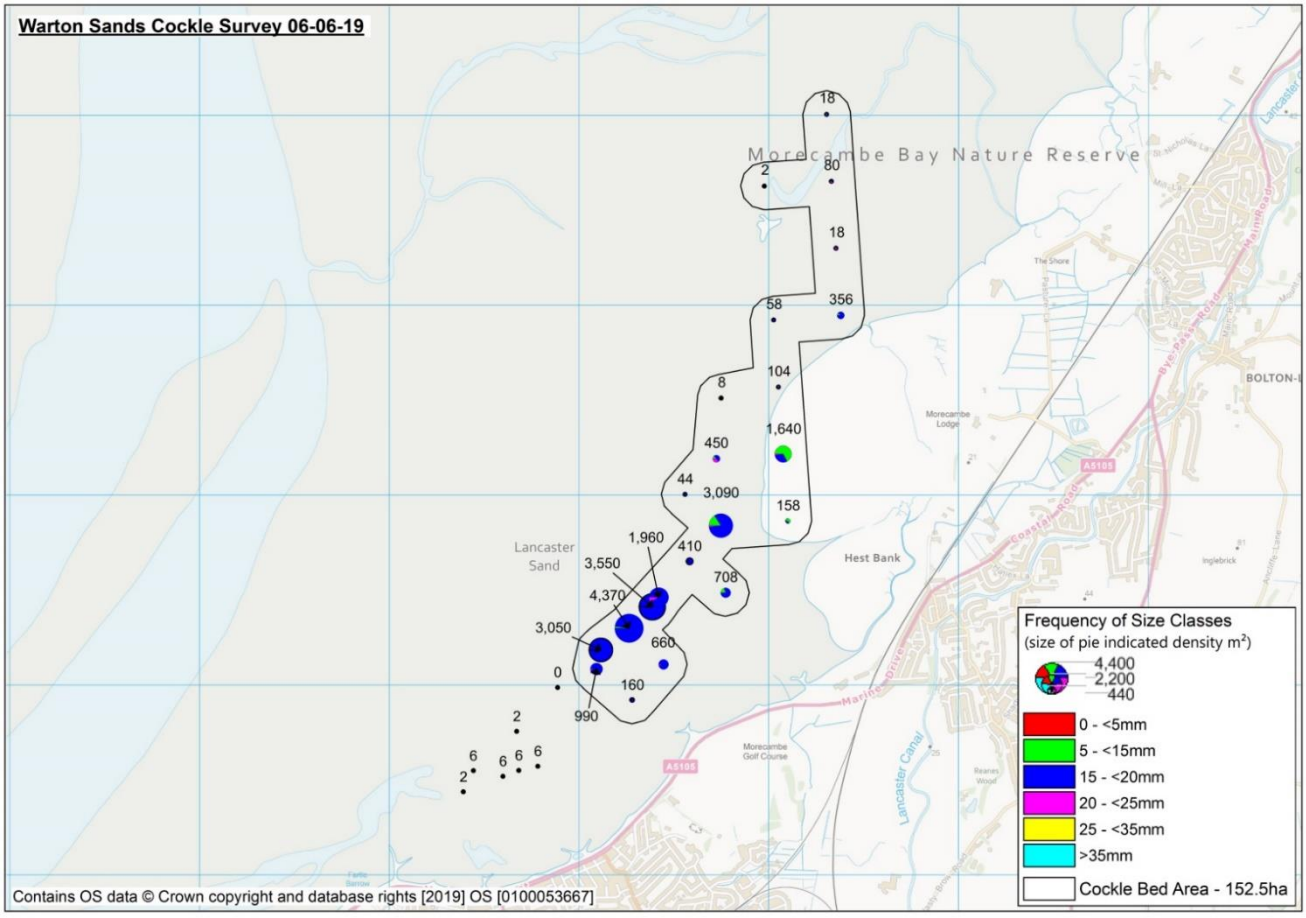
Illustration of position of Warton Sands cockle bed



Density of size cockle per m² Warton Sands June 2019



Density of undersize cockle per m² Warton Sands June 2019



Frequency of size classes of cockle per m² Warton Sands June 2019

Warton Sands cockle inspection - 19th July 2019

An inspection of the bed was carried out to find out if the area of cockle surveyed on the 6th June was still present and in a similar density and whether the cockles had grown. Due to thick mud the bed was walked and areas where cockle was previously dense were inspected. There appears to be no change in the area or density of cockle. There has been some growth with more 20-22mm cockles mixed in with the 15-20mm cockle, particularly in the south of the bed. There were approximately 200 oystercatchers feeding on the cockle with evidence of broken shell. The oystercatchers were not feeding in the densest areas but appeared to be choosing the area with harder ground and a more sandy sediment. The bed will be monitored monthly to assess survivability, density and growth.

Flookburgh Cockle Survey - 1st and 2nd July 2019

Survey method - Jumbo and 0.5m^2 quadrat

95 stations were sampled over two days from a 500m grid. Four additional stations were added to ensure full coverage. The Kent Channel appeared to have shifted west and the sand running along its edge seemed high and very dry and not suitable for cockles. Following some initial attempts to sample this area, efforts were diverted to areas away from it, hence the 'cut-out' in the mapping.

Mean number of size cockle	7 per m^2	(min 0, max 156)
Mean number of undersize cockle	61 per m^2	(min 0, max 990)
Mean number of 0-5mm cockle	0 per m^2	(min 0, max 8)

Biomass	Area (ha)	Size Cockle (tonnes)[1]	Undersize Cockle (tonnes)
Flookburgh	**2610**	**~1700**	**~4900**

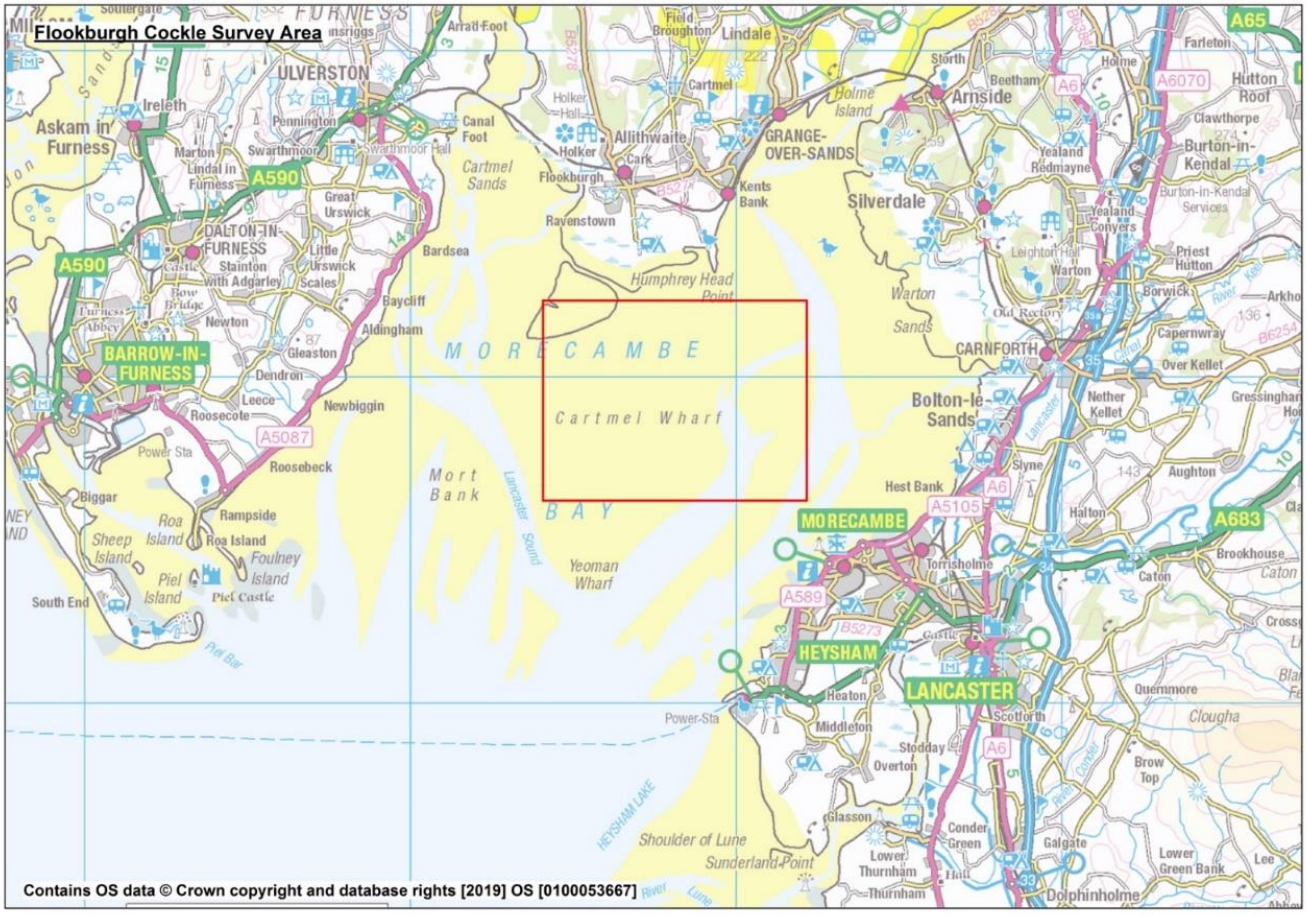
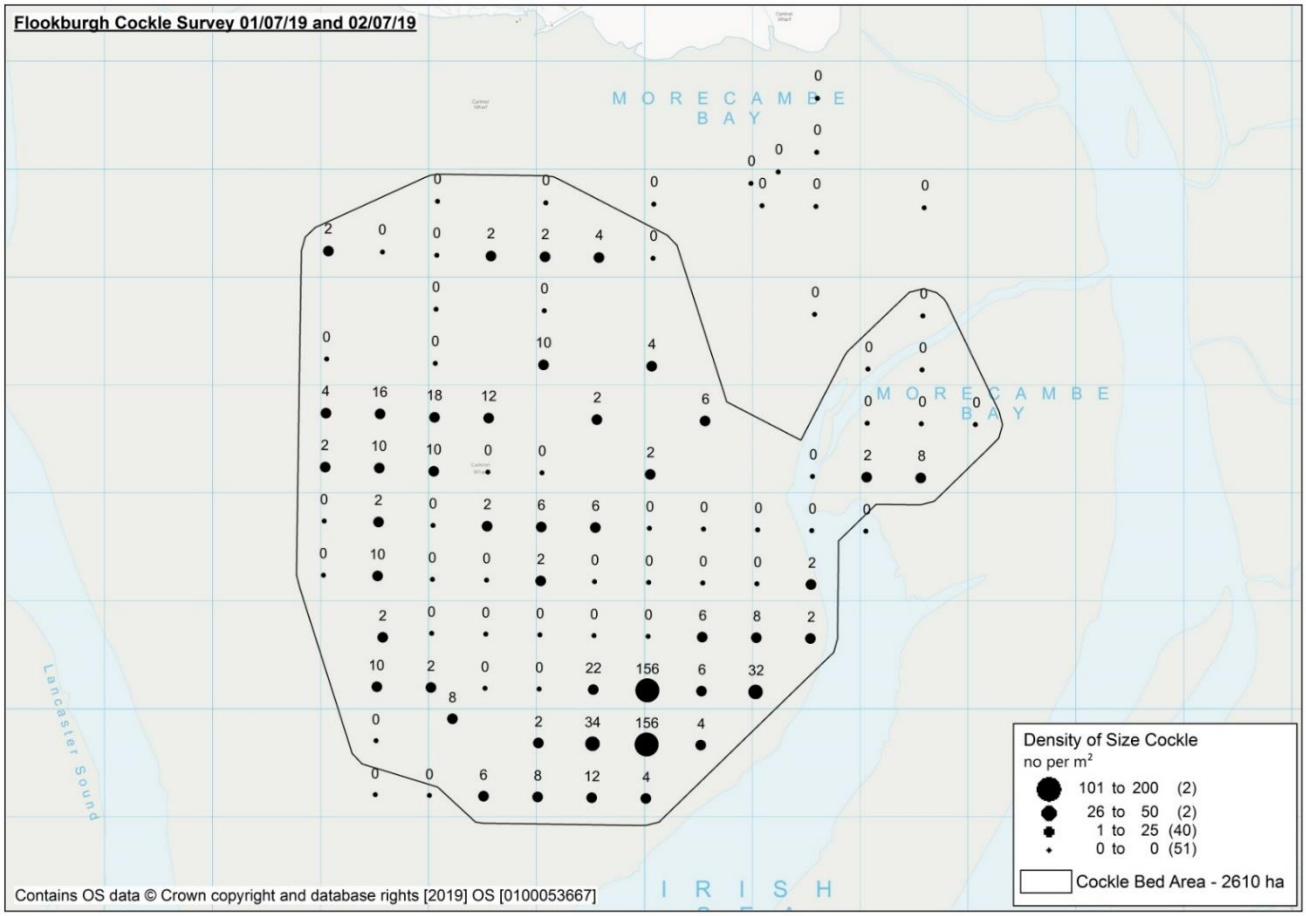
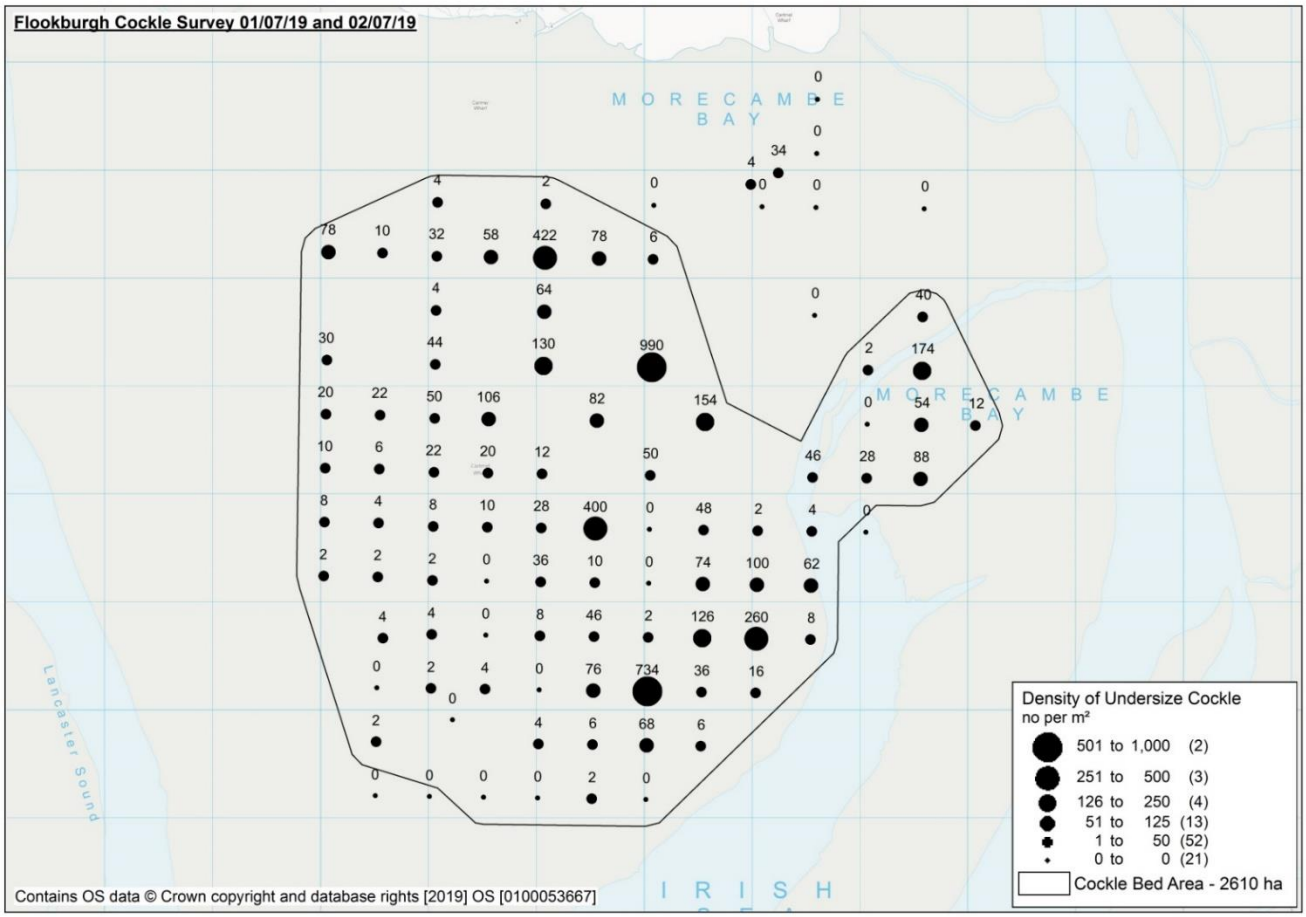


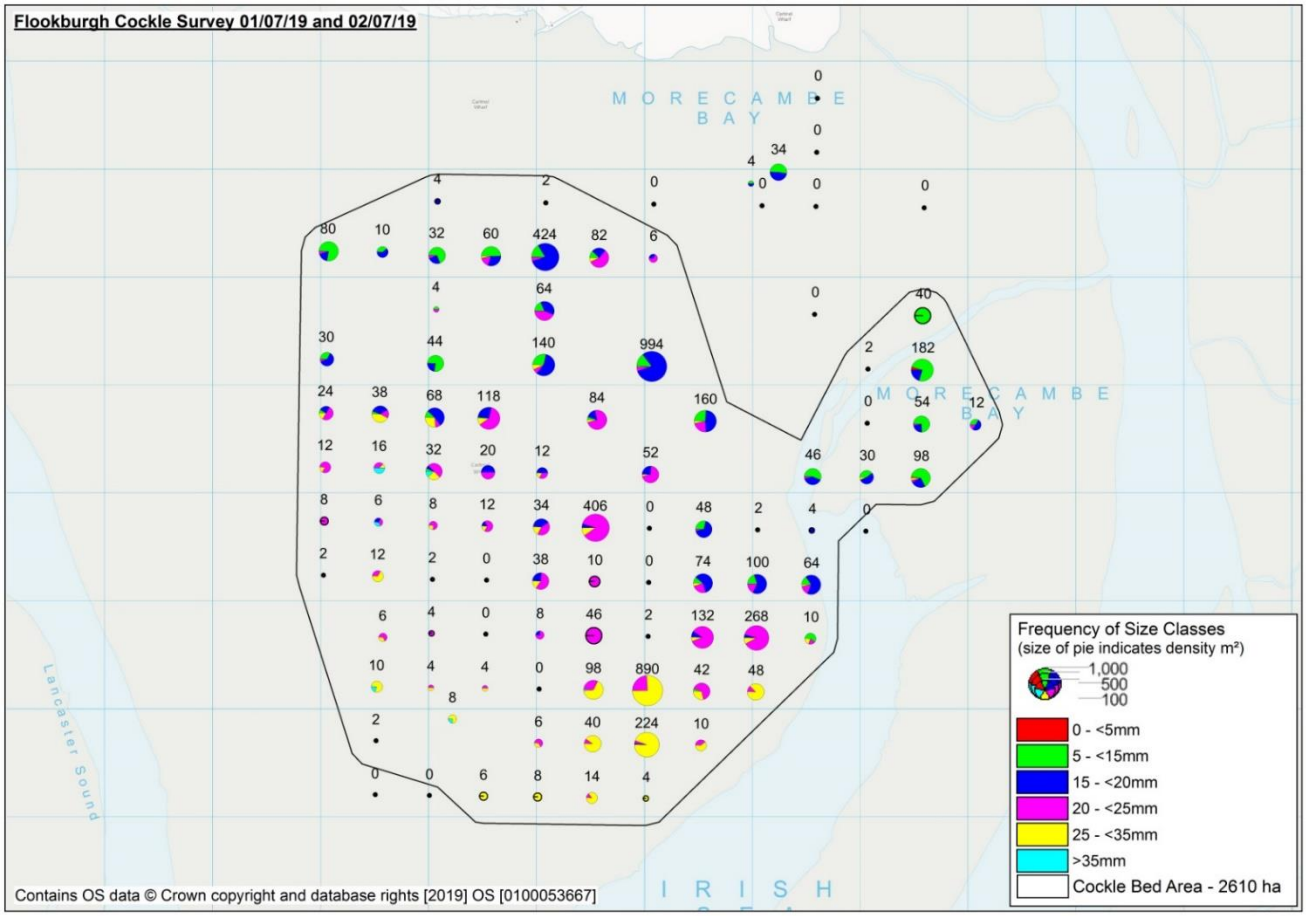
Illustration of position of Flookburgh Survey Area



Density of size cockle per m² Flookburgh July 2019



Density of undersize cockle per m² Flookburgh July 2019



Frequency of size classes of cockle per m² Flookburgh July 2019

Leven Sands cockle survey - 3rd July 2019

Survey method - Jumbo and 0.5m² quadrat

75 stations were sampled from a 250m grid. 15 additional stations were added in an effort to find the edges of the bed off the main grid. Undersize cockle continued to be found as officers sampled random waypoints on the way north back to shore. This was abandoned two hours after low water at 2100hrs due to tide and daylight constraints. Small cockle appeared to continue far north and to be running up the Leven Estuary east side, which concurs with industry reports.

Mean number of size cockle	4 per m²	(min 0, max 24)
Mean number of undersize cockle	50 per m²	(min 0, max 172)
Mean number of 0-5mm cockle	0 per m²	(min 0, max 0)

Biomass	Area (ha)	Size Cockle (tonnes)[1]	Undersize Cockle (tonnes)
Leven Sands	**1067**	**~500**	**~1500**

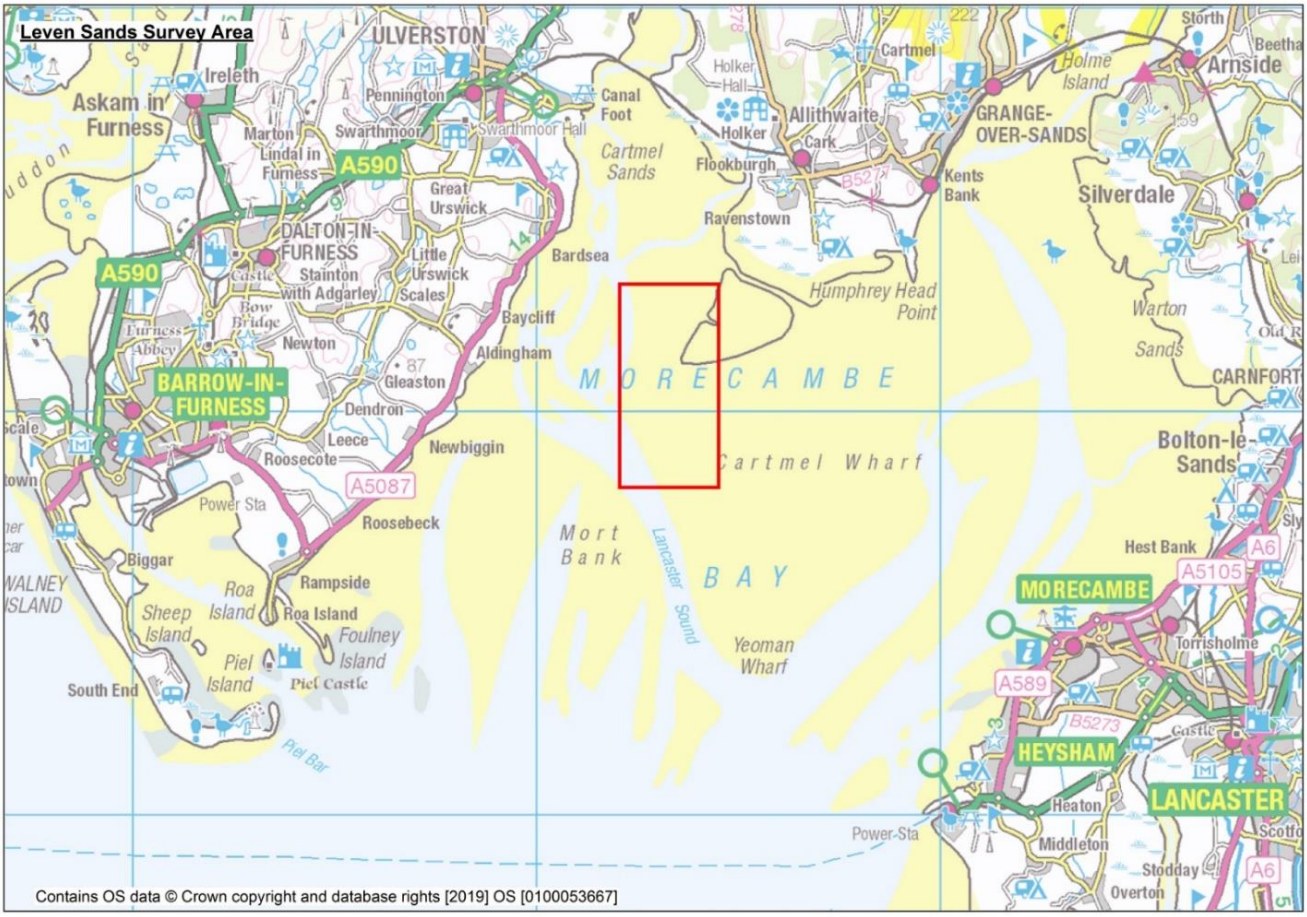
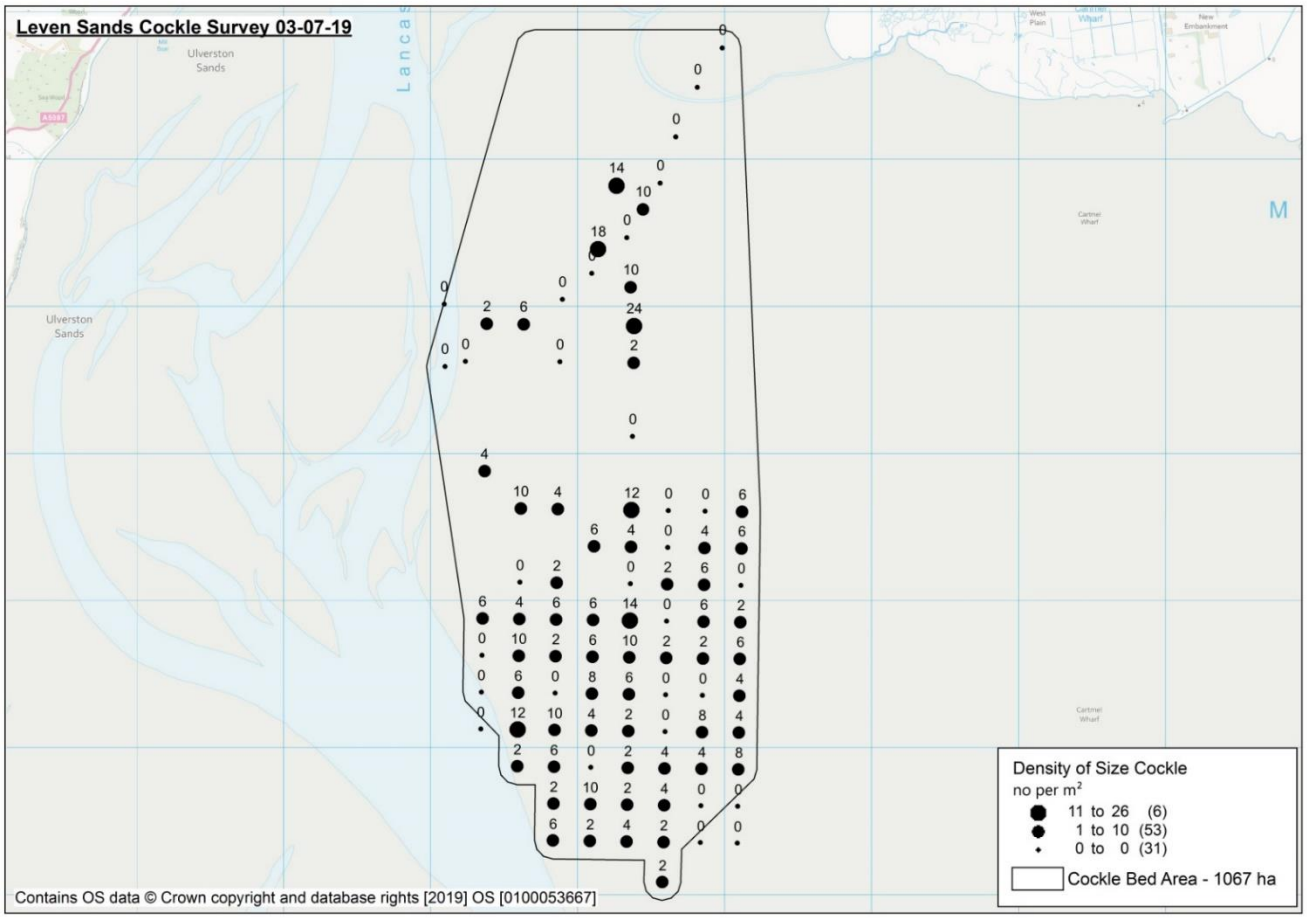
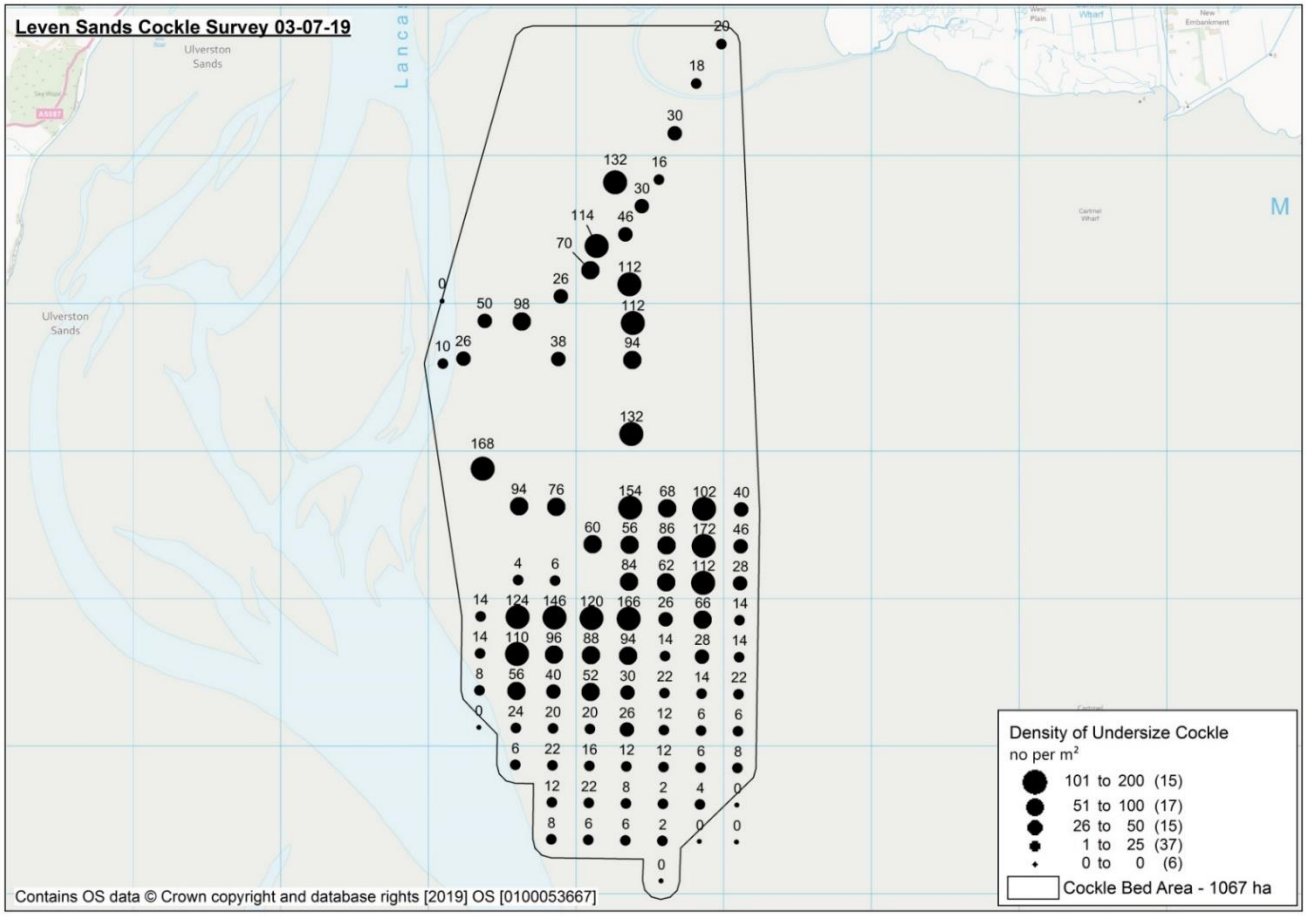


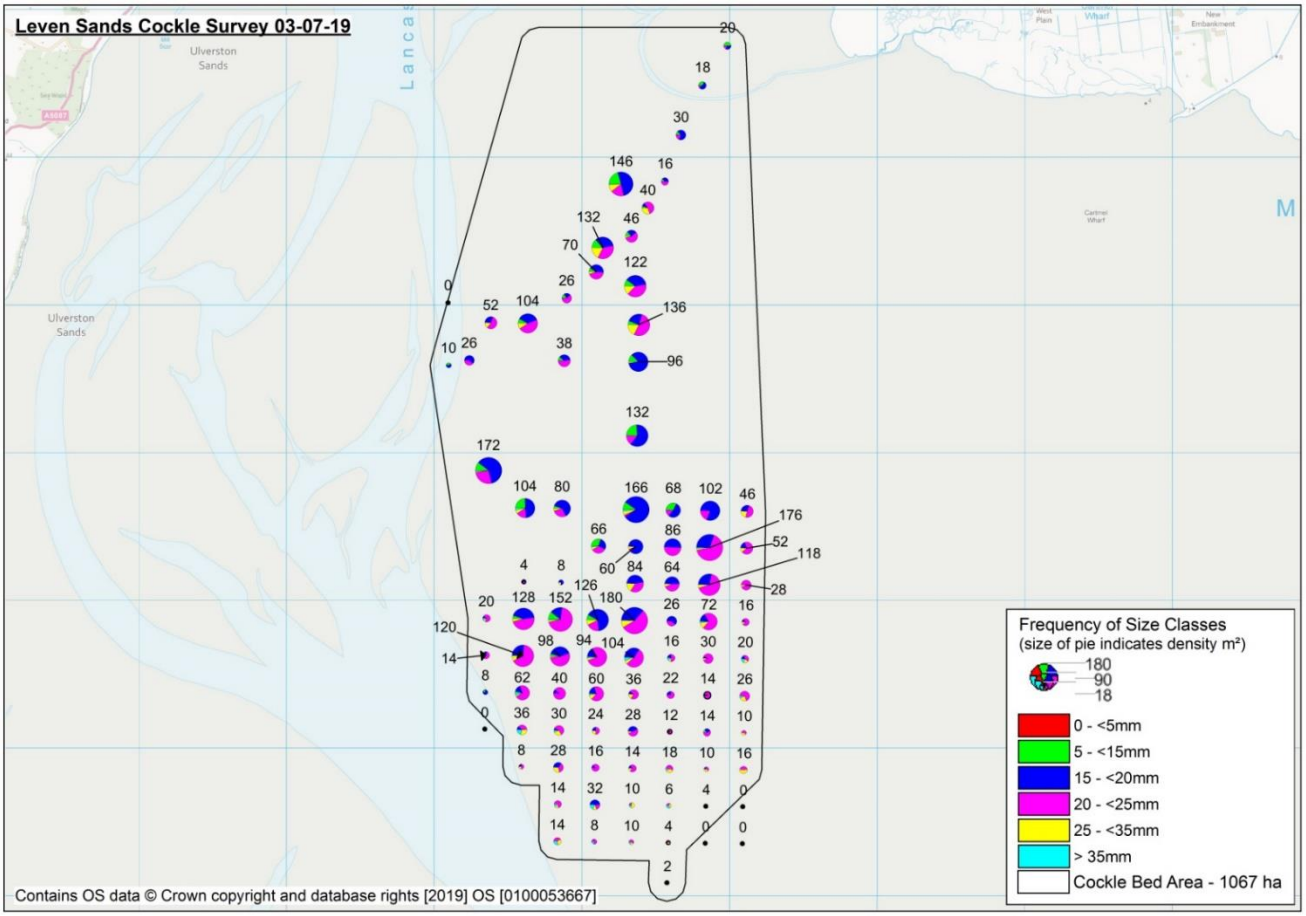
Illustration of position of Leven Sands Survey Area



Density of size cockle per m² Leven Sands July 2019



Density of undersize cockle per m² Leven Sands July 2019



Frequency of size classes of cockle per m² Leven Sands July 2019

Newbiggin and Aldingham cockle survey - 15th July 2019

Survey method - Jumbo and 0.5m^2 quadrat

62 stations were sampled from a 500m grid. Six additional stations were added to ensure full coverage. There was a wide range of cockle sizes across the bed from less than 5mm mainly found in mud on the upper shore, to greater than 35mm cockle. The area of cockle was close to the shore line with very little cockle present beyond 1.5 and 2km from the sea wall.

Mean number of size cockle	7 per m^2	(min 0, max 32)
Mean number of undersize cockle	46 per m^2	(min 0, max 404)
Mean number of 0-5mm cockle	117 per m^2	(min 0, max 1500)

Biomass	Area (ha)	Size Cockle (tonnes)[1]	Undersize Cockle (tonnes)
Aldingham and Newbiggin	**1092**	**~800**	**~1500**

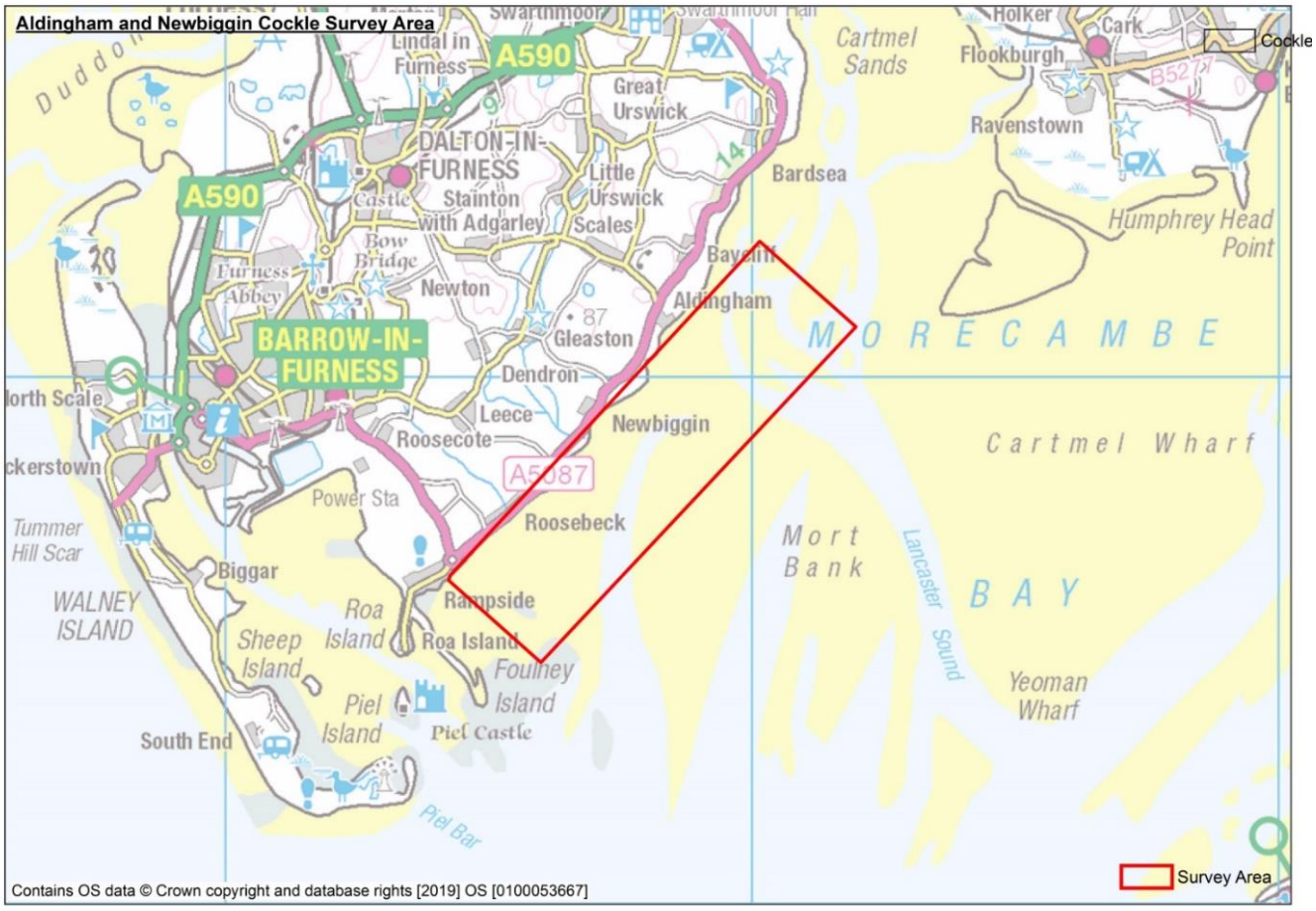
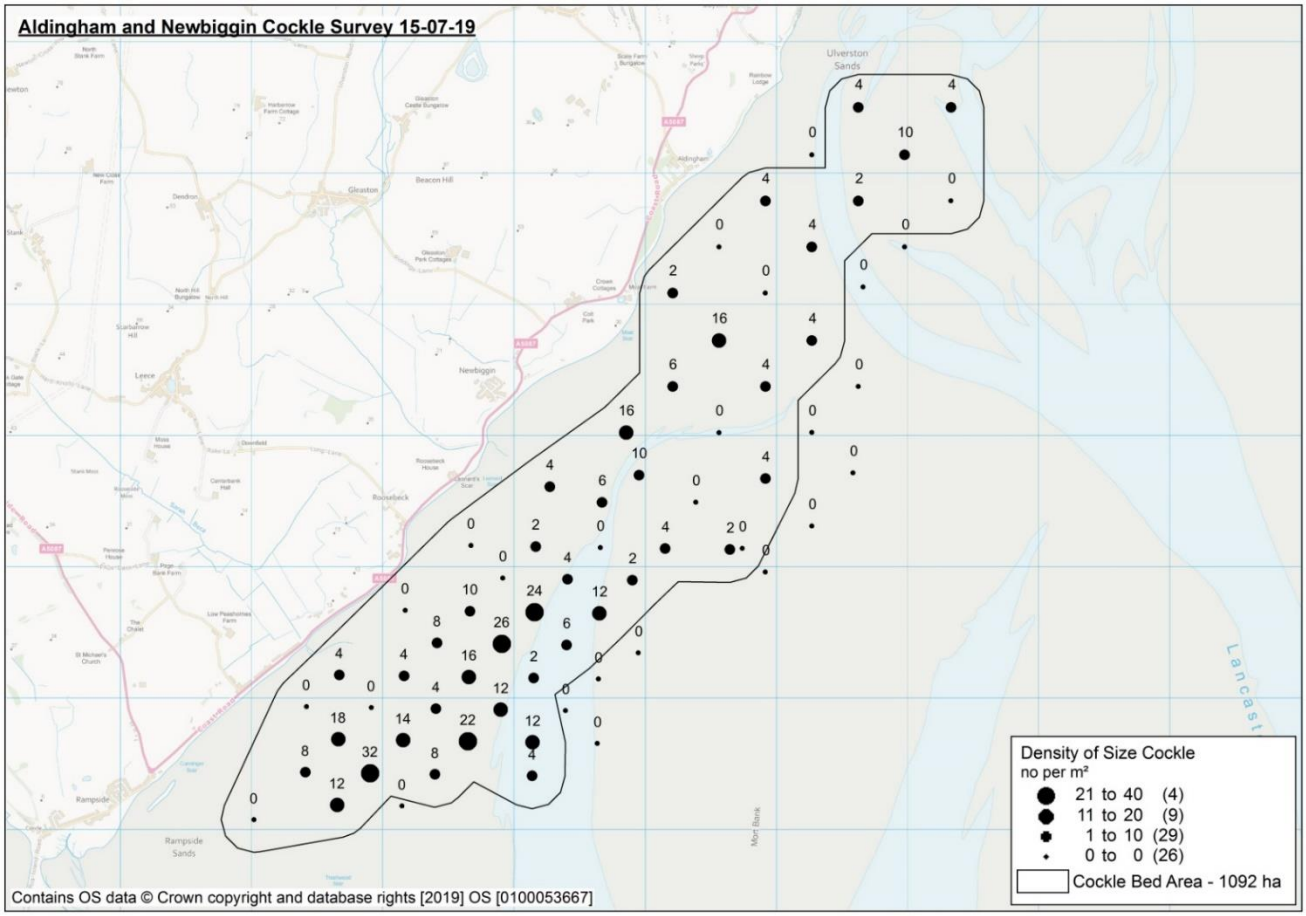
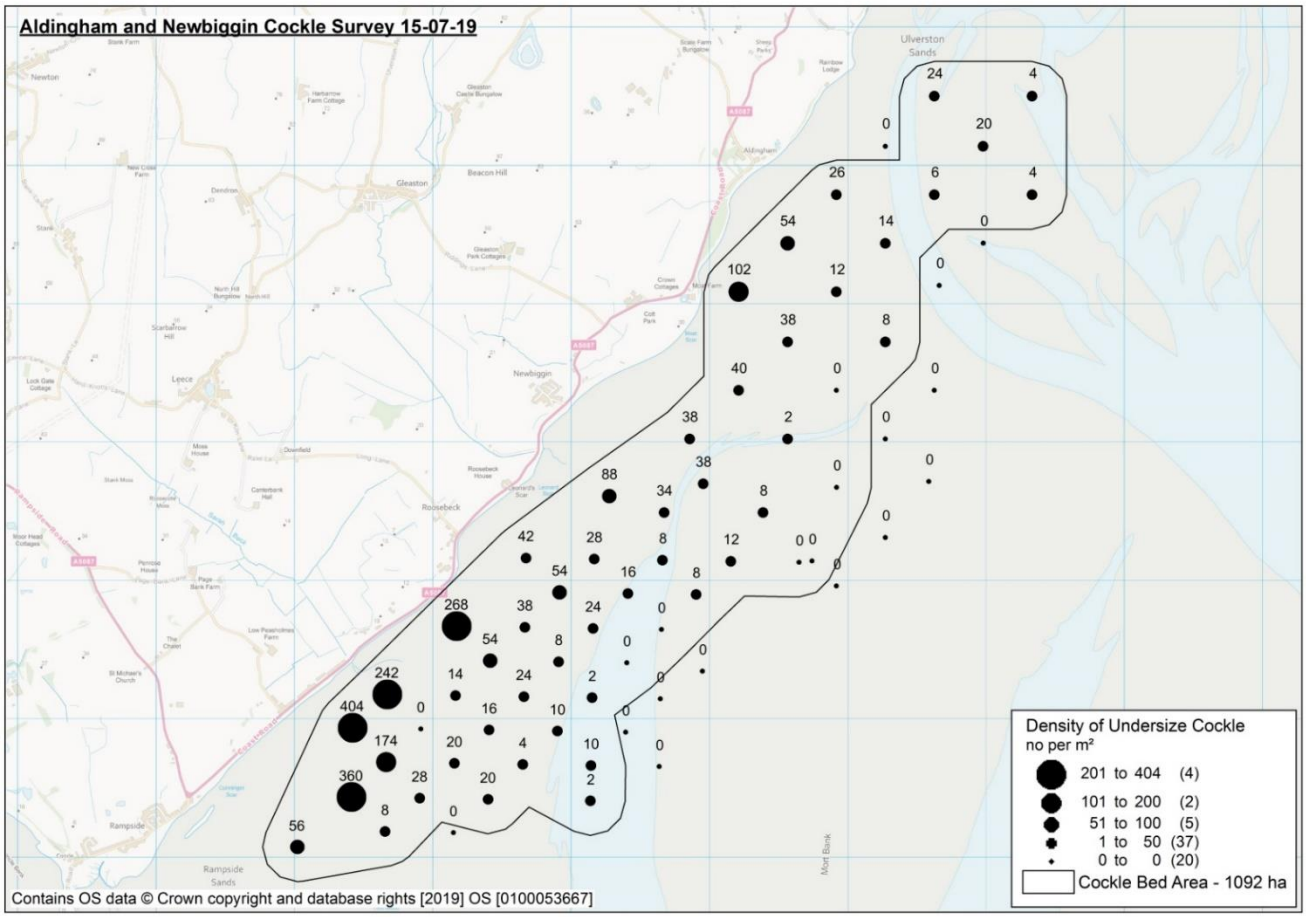


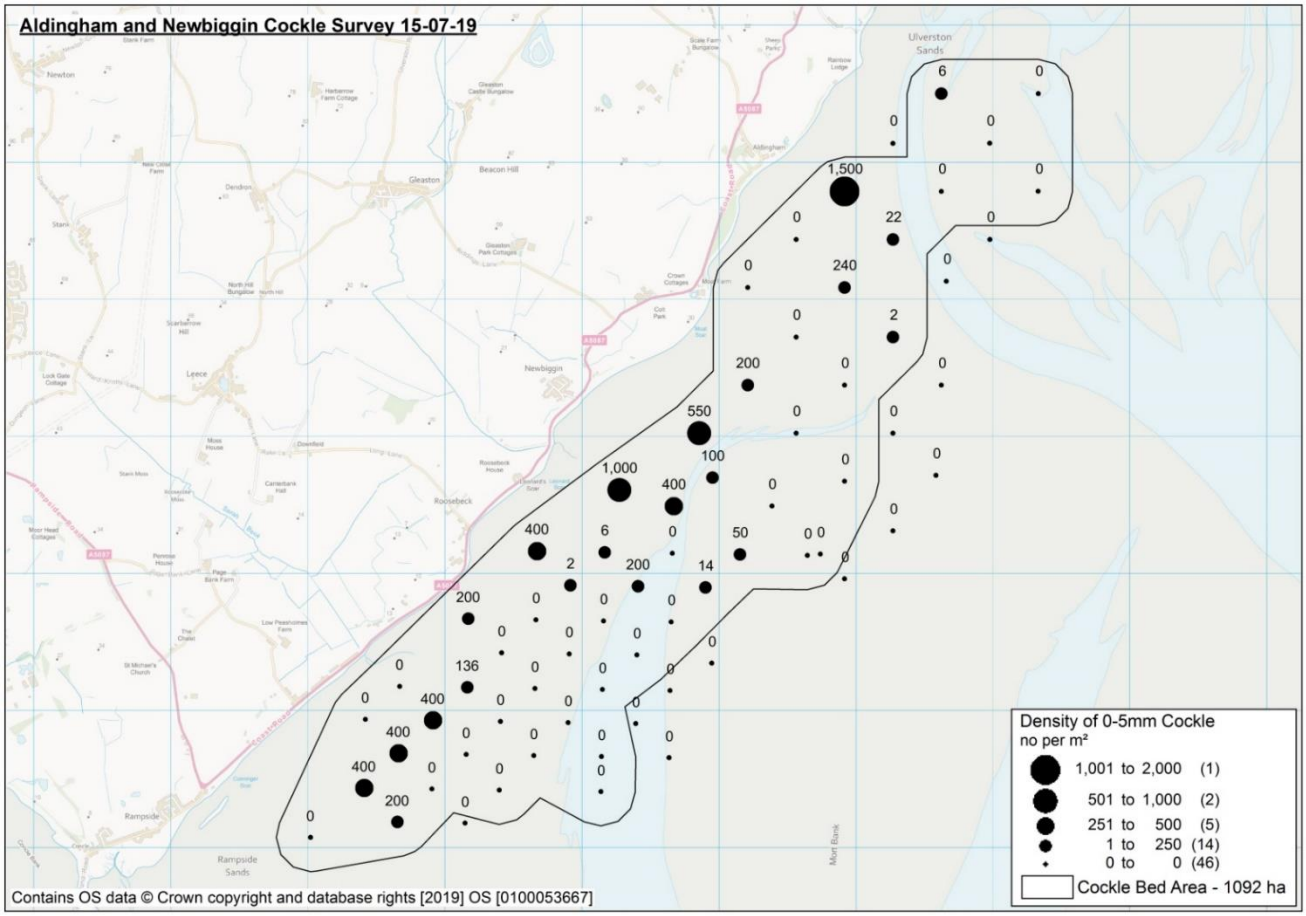
Illustration of position of Aldingham and Newbiggin Survey Area



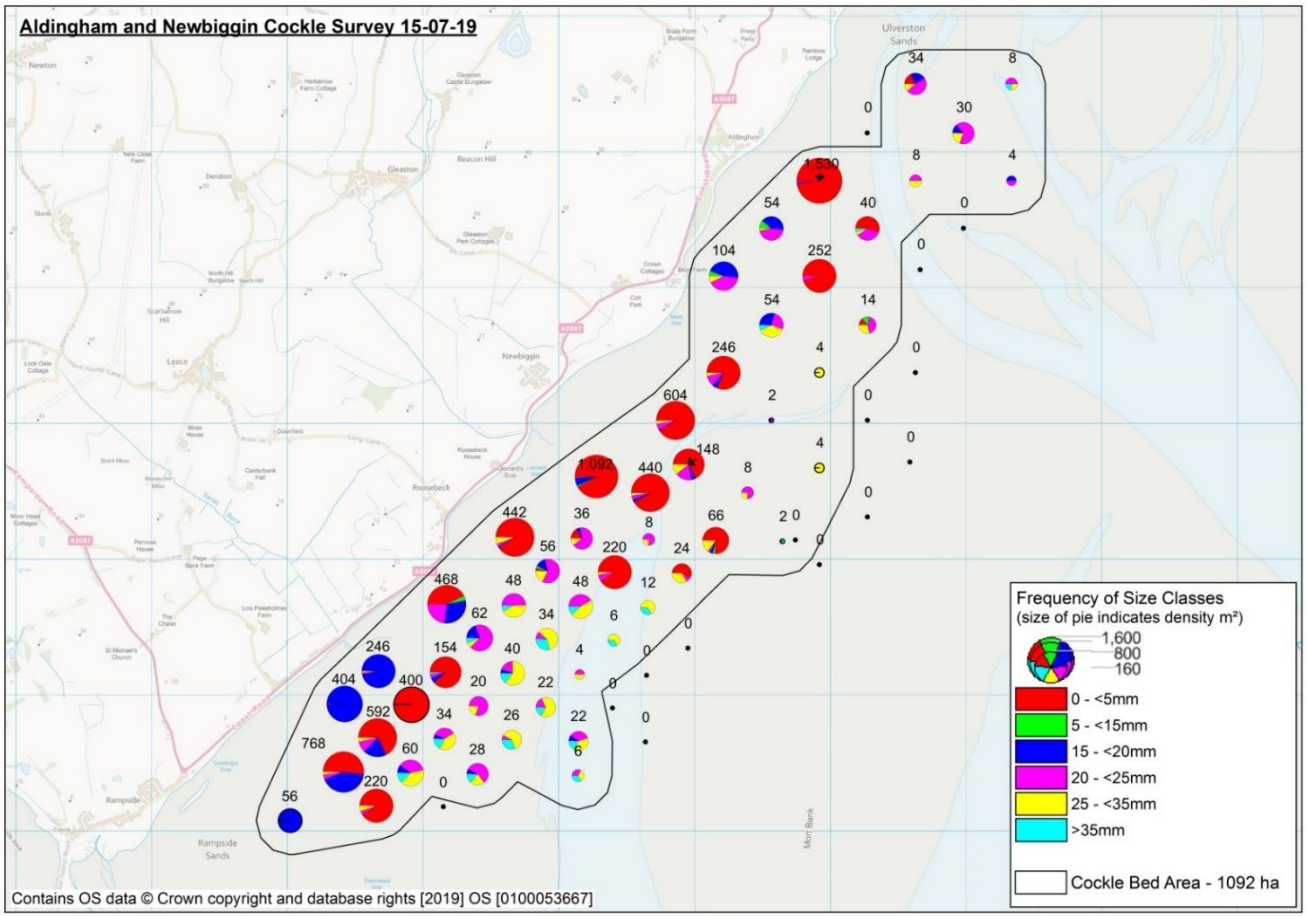
Density of size cockle per m² Aldingham and Newbiggin July 2019



Density of undersize cockle per m² Aldingham and Newbiggin July 2019



Density of 0-5mm cockle per m² Aldingham and Newbiggin July 2019



Frequency of size classes of cockle per m² Aldingham and Newbiggin July 2019

Pilling cockle survey - 16th July 2019

Survey method - Jumbo and 0.5m^2 quadrat

57 stations were sampled from a 500m grid. Five additional stations were added to ensure full coverage. There was a relatively low density of size cockle across the bed with a small area of higher density size cockle to the east in a similar area that was fished in the 2018-2019 cockle season. Most survey stations had undersize cockle present which ranged from 15 – 25mm in shell length. Some areas of the bed had received a 2019 spat settlement but this was not consistent across the bed.

Mean number of size cockle	8 per m²	(min 0, max 104)
Mean number of undersize cockle	43 per m²	(min 0, max 308)
Mean number of 0-5mm cockle	33 per m²	(min 0, max 480)

Biomass	Area (ha)	Size Cockle (tonnes)[1]	Undersize Cockle (tonnes)
Pilling Sands	**1323**	**~1000-1200**	**~1300-1500**

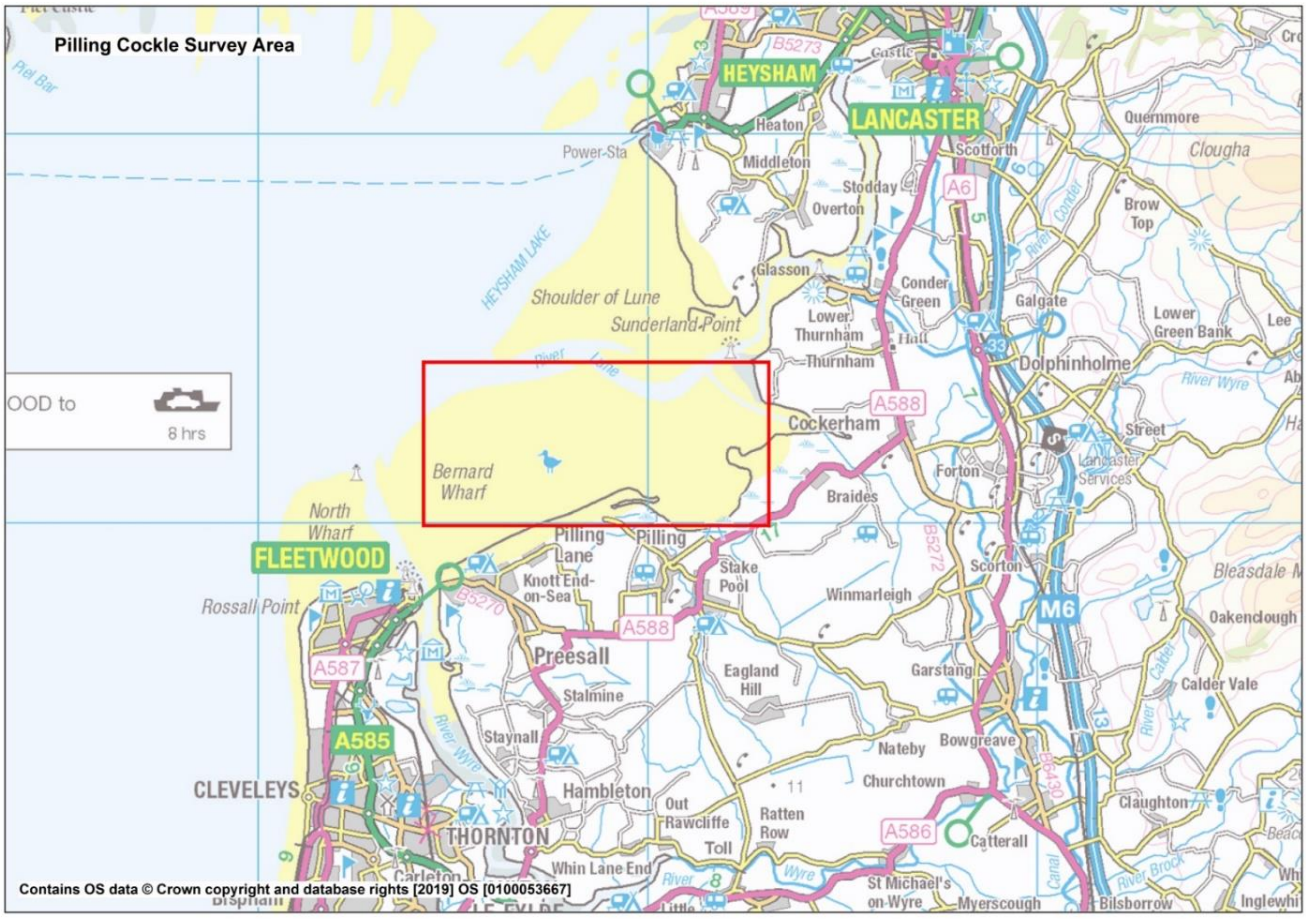
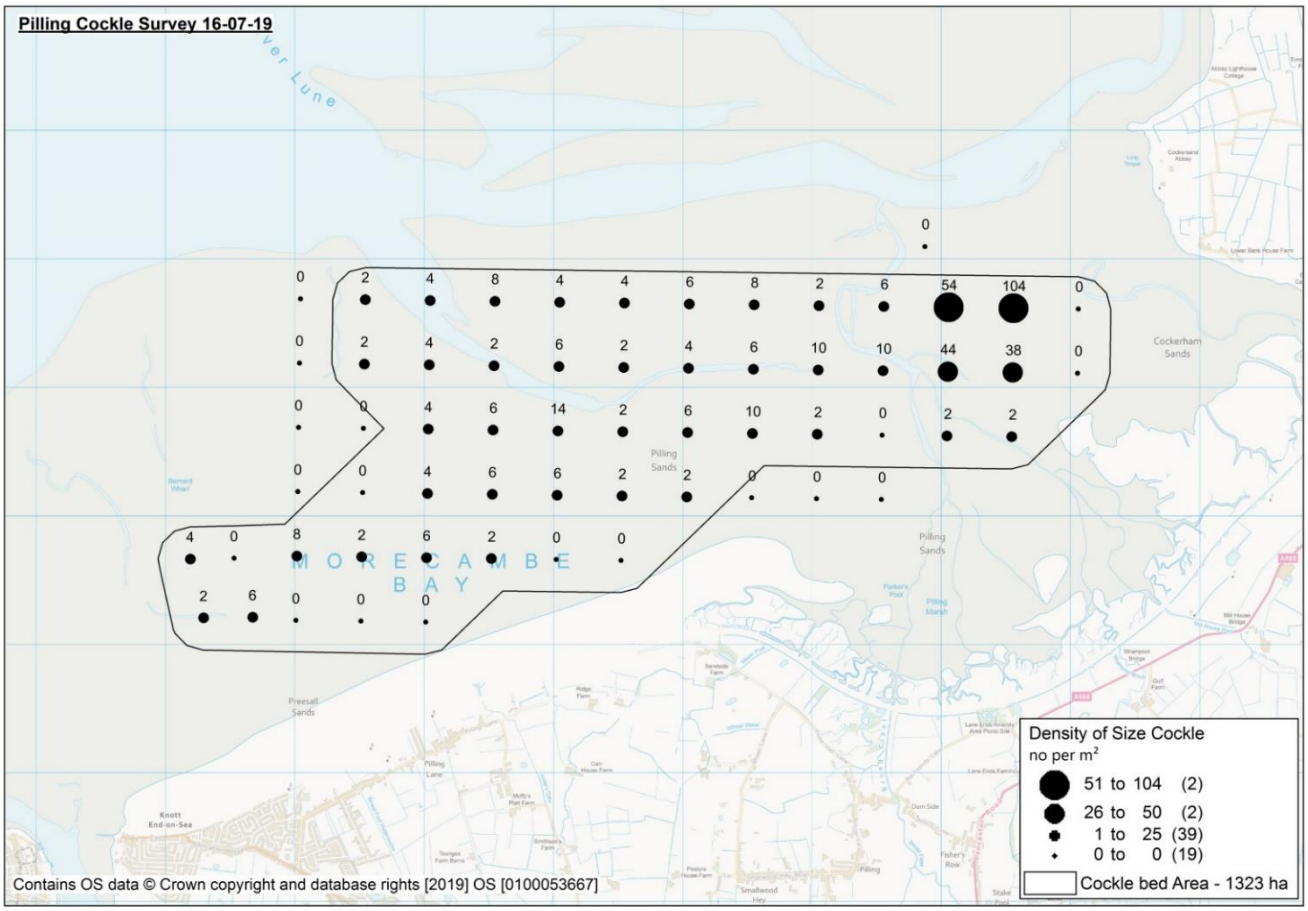
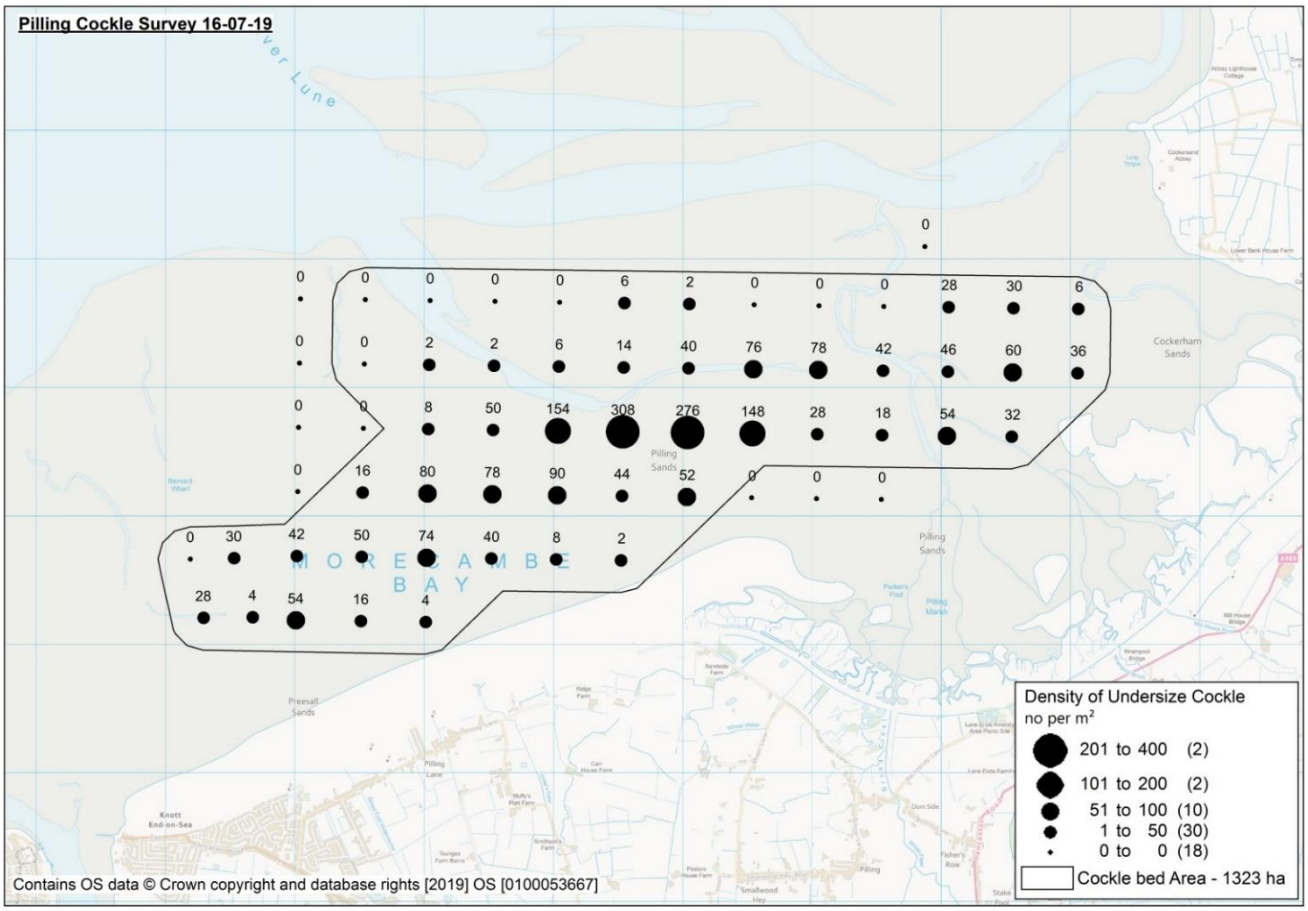


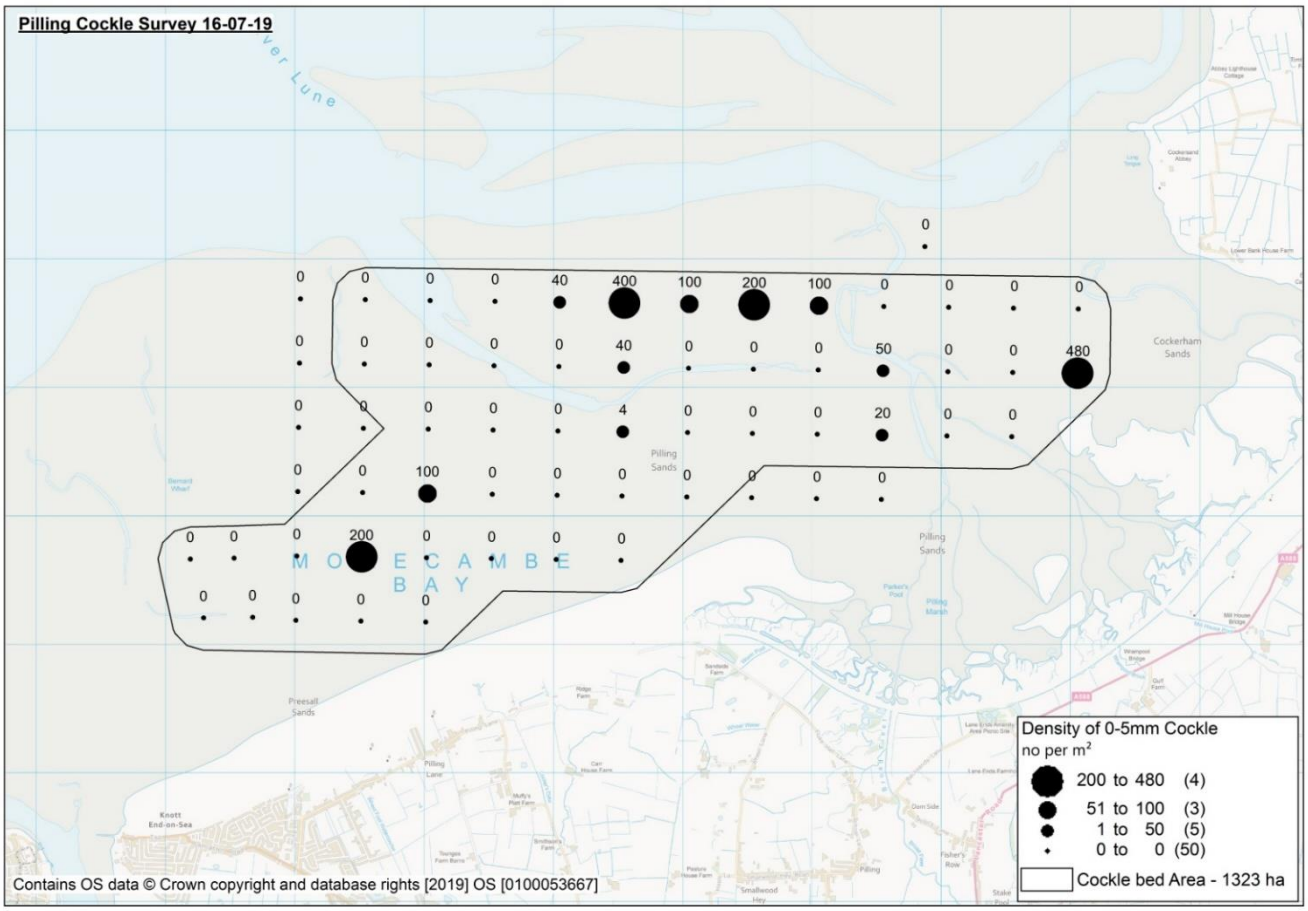
Illustration of position of Pilling Sands Survey Area



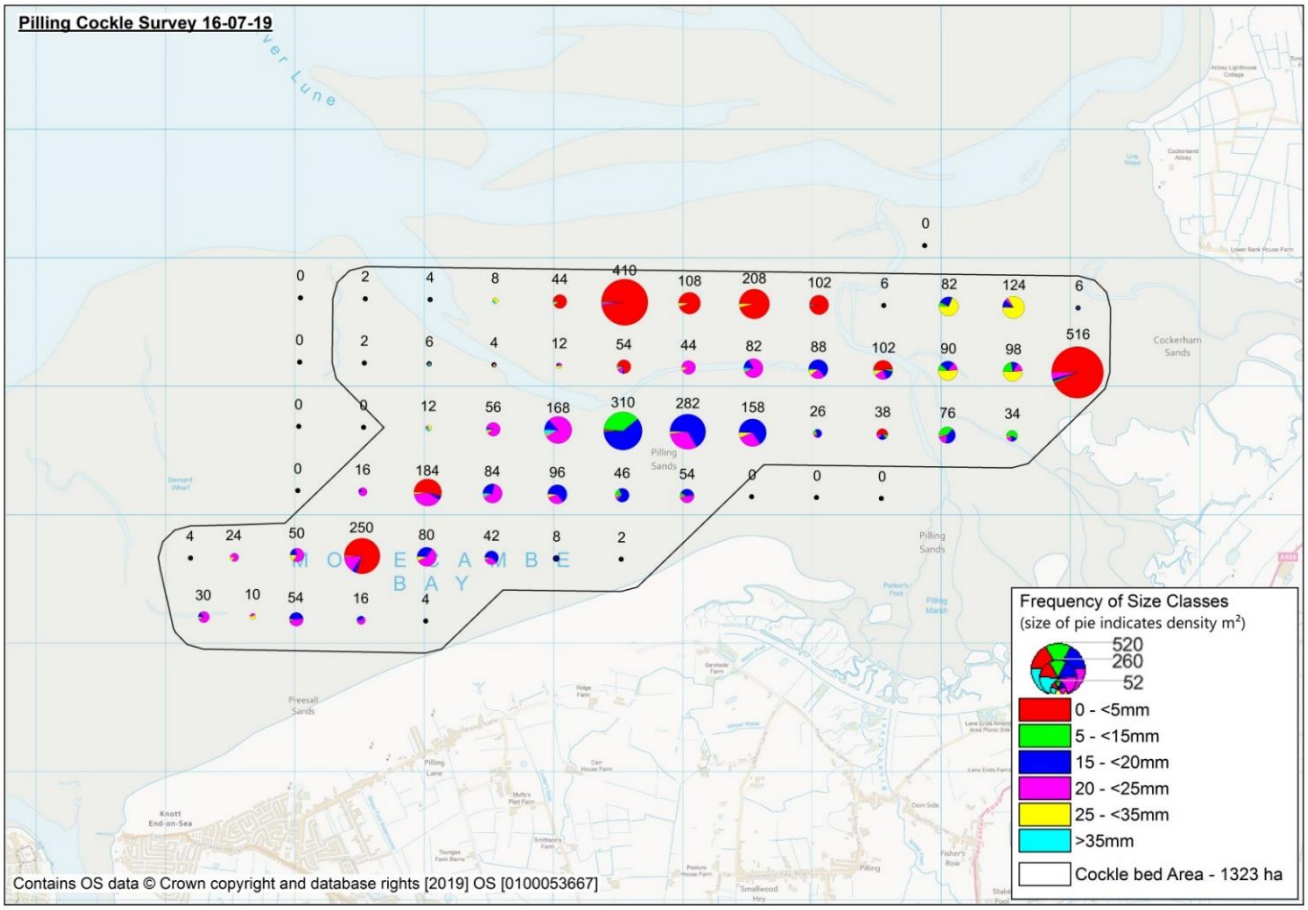
Density of size cockle per m² at Pilling Sands July 2019



Density of undersize cockle per m² at Pilling Sands July 2019



Density of 0-5mm cockle per m² at Pilling Sands July 2019



Frequency of size classes of cockle per m² at Pilling Sands July 2019

Tables 1 & 2 show survey results for Morecambe Bay Cockle Stocks 2019, with a detailed break down of the stocks.

Cockle Bed	Name of Parts of Cockle Bed if Split	No. of stations sampled	Bed Area (ha)	No. of stations within the bed area	No. of stations with undersize cockle (% of stations within the bed area)	No. of stations with size cockle (% of stations within the bed area)	No. of stations with ≥ 20m² size cockle (% of stations within the bed area)	Approximate area of stations with ≥ 20m² size cockle in hectares (% of bed area)	Estimated Biomass of Size Cockle (tonnes)	Estimated Biomass of Undersize Cockle (tonnes)
Aldingham & Newbiggin	Total	68	1092	55	48 (87%)	42 (76%)	4 (7%)	50 (5%)	800	1500
Leven	Total	90	1067	85	84 (99%)	59 (69%)	1 (1%)	6 (<1%)	500	1500
Flookburgh	Total	95	2610	86	73 (85%)	43 (50%)	5 (6%)	125 (5%)	1700	4900
Warton	Total	29	152	22	22 (100%)	3 (14%)	0 (0%)	0 (0%)	<10	2300
Middleton	Total	53	461	44	35 (80%)	34 (77%)	3 (7%)	37 (8%)	300-350	80-100
Pilling	Total	62	1323	53	44 (83%)	43 (81%)	4 (75%)	100 (8%)	1000-1200	1300-1500
TOTAL			**6705**						**4435**	**11690**

Cockle Bed	Tide Height LW (m)	Size Range (mm)	Min Density 0 - 5mm cockle per m²	Max Density 0 - 5mm cockle per m²	Mean Density 0 - 5mm cockle per m²	Min Density Undersize per m²	Max Density Undersize per m²	Mean Density Undersize per m²	Min Density Size per m²	Max Density Size per m²	Mean Density Size per m²
Aldingham & Newbiggin	1.9	0 to 35+	0	1500	117	0	404	46	0	32	7
Leven	1.2	5 to 35+	0	0	0	0	172	50	0	24	4
Flookburgh	1.7 1.4	0 to 35+	0	8	<1	0	990	61	0	156	7
Warton	1.2	5 to 35	0	0	0	2	4370	994	0	8	<1
Middleton	1.2	0 to 35+	0	0	0	0	142	17	0	52	7
Pilling	1.8	0 to 35+	0	480	33	0	308	43	0	104	8

4. Proposal

The proposal is to open Newbiggin, Flookburgh / Leven Sands and the east side of Pilling Sands cockle beds, Morecambe Bay, to removal of size cockles to hand-gathering; to open 1st September 2019 until the start of the 2020 closed season on 1st May 2020 unless closed by NWIFCA prior to this date for management reasons. The reason for closing part of Pilling Sands is because there are some clear differences between the east and the west of the bed. The area east of the access slipway contains the majority of size cockle and the area where size cockle density is highest. The area west of the slipway consists of higher densities of juvenile cockle and lower densities of size cockle.

The other beds at Middleton Sands and Aldingham will remain closed under byelaw due to lack of stock (in commercial fishery terms). Warton Sands will remain closed for the time being due to lack of size stock. Should the undersize cockle there grow on and a commercial fishery be possible, a further HRA would be carried out to ensure all cockle fisheries in the Bay remain compliant with the Habitats and Birds Regulations.

5. Test for Likely Significant Effect (LSE)

The following has been added to the TLSE table within the **NWIFCA-MB-EMS-2017 HRA** – Removal of non-target species have been taken through to appropriate assessment due to potential for the fishing activity to damage non-target species.

Qualifying Feature	Sub-feature	Potential pressure(s)	Sensitivity	Potential for Likely Significant Effect?	Justification and evidence
H1130. Estuaries H1140. Mudflats and sandflats not covered by seawater at low tide; Intertidal mudflats and sandflats H1160. Large shallow inlets and bays SPA Supporting Habitats	Intertidal sand and muddy sand intertidal mixed sediments, intertidal coarse sediment	Removal of non-target species	Sensitive	Yes	Feature and pressure taken through to AA due to potential damage of fishing activity on none target species. Undersize bivalves, other bivalve species and molluscs.
All SPA features		Removal of non-target species	Sensitive	Yes	Feature and pressure taken through to AA for all shore feeding SPA features that feed on infaunal molluscs

6. Appropriate Assessment

Potential risks to features

6.1 Potential risks to SAC and SPA supporting habitat features

- Intertidal sand and muddy sand
- Intertidal mixed sediments, intertidal coarse sediment
- Saltmarsh

6.1.1 Pressures and Potential Impacts

i. <u>Litter</u>

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

ii. Removal of target species - Intertidal sand and muddy sand, mixed and coarse sediments only

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.

iii. Removal of non-target species - Intertidal sand and muddy sand, mixed and coarse sediments only

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 through damage from fishing activity.

iv. Abrasion, penetration and disturbance of the substrate - saltmarsh only

There is a potential for vehicles to cause damage to the saltmarsh when accessing the fishery which has the potential to affect the extent, distribution and condition of the feature.

6.1.2 Exposure

i. Litter

Since 2016 there have been a number of cockle fisheries in Morecambe Bay (Newbiggin, Flookburgh, Leven Sands and Pilling Sands) and in most years there has been a fishery on Heysham Flat for seed mussel as well as on-going size mussel fisheries around Morecambe Bay. There have only been a few reports of litter being an issue at any of these fisheries, which are regularly inspected by fishery officers. Where issues have been raised officers work with gatherers, buyers and the local authority to resolve the issues. A Code of Practice for Intertidal Hand-gathering includes responsibility for littering. NWIFCA takes a swift response to any alerts to littering issues.

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 the NWIFCA can conclude that litter will have no risk of adverse effect on the integrity or conservation status of the designated features within the site.***

ii. Removal of target species - Intertidal sand and muddy sand, mixed and coarse sediments only

Surveys have been carried out across Morecambe Bay and a summary of results have been provided above in Section 3. Further to the above information there will also be limited stocks of size and undersize cockle on other beds around Morecambe Bay these include Cockerham Sands and Duddon Sands.

The proposal is to open Newbiggin, Flookburgh / Leven Sands and the east side of Pilling Sands cockle beds in Morecambe Bay to hand gathering. All other beds would be closed under NWSFC Bylaw 16 Shellfishery – Temporary Closure, leaving areas unfished.

From the surveys the following statements describe the cockle stocks in Morecambe Bay as a whole:

- Generally mean densities of size cockle are low over most areas of each bed. There are discrete patches of dense size cockle but this is not consistent across the beds.
- There is a relatively consistent distribution of undersize cockle indicating ranging in size classes.
- The undersize / juvenile cockle is mixed in with size cockle.

The proposed fisheries would be managed under NWIFCA Byelaw 3 – Permit to Fish for Cockle and Mussels which includes management measures such as a minimum size, fishing methods and the requirement of a permit for commercial fishing. There are currently a maximum of 136 permits which could be issued for 2019 / 2020 for the whole NWIFCA District. It is predicted from the stock information, communication with permit holders and from officers' experience of Morecambe Bay cockle fisheries since 2016, that there are only likely to be 40-60 active permit holders fishing at any one time across all of the open beds combined. The opening of four beds across the site ensures that effort is spread out and not concentrated on one bed.

Aldingham, Warton Sands, Middleton Sands and the west side of Pilling Sands which all have stock of mixed sizes will be closed. Below is a table showing the biomass of cockle on each of the main closed areas:

Cockle Bed	Bed Area (ha)	Estimated Biomass of Size Cockle (tonnes)	Estimated Biomass of Undersize Cockle (tonnes)
Warton	152	<10	2300
Middleton	461	300-350	80-100
Pilling West	788	200-400	700-900
TOTAL	**1401**	**630**	**3190**

In addition to what will be left on the closed beds there will be significant undersize on the beds that will open: Newbiggin 1500 tonnes, Leven 1500 tonnes, Flookburgh 4900 tonnes and Pilling 600 tonnes. Although some of the undersize cockle will grow and reach size before or during the fishery the majority of the undersize will remain on the bed.

The size cockle on the proposed open beds are only in discrete locations and fishing will only occur in areas where the size cockle is at the greatest densities. Although there is size cockle on a large proportion of the beds much of the beds will remain unfished because the cockle density is not high enough to make it commercially viable to fish it. The area of cockle with more than 20 per m² size cockle is 180 hectares of a total of 6705 hectares of cockle bed, which equates to 2.7 % of the total cockle bed area.

Although the proposal is to open a large proportion of the Morecambe Bay cockle beds, when considering the above it is not considered that any further management is needed.

Therefore the NWIFCA can conclude that removal of target species will have no risk of adverse effect on the integrity or conservation status of the designated features within the site.

iii. Removal of non-target species - Intertidal sand and muddy sand, mixed and coarse sediments only

In the 2018/2019 Morecambe Bay cockle fishery, NWIFCA implemented management by authorising the removal of size cockle by Craam from three of the four open cockle beds to protect juvenile stock as concerns were raised on the impact of raking on juvenile cockle.

During the fishery NWIFCA tested a number of methodologies to investigate the potential impact of jumbo-ing and raking on juvenile cockle. Unfortunately, due to the difficulty of designing a methodology that removes the numerous variables that affect the breakage rates of cockles, changing environmental factors and the natural variation of cockle densities, the investigations did not produce results from which the difference in sample size (number of individuals) could be assigned to damage or loss during the fishing activity. However, a number of observation can be drawn from the data collected. There was not a significant number of damaged cockle observed in any of the samples and although the sample sizes (number of individual cockles) varied between treatments (control, jumbo-ing, jumbo-ing and raking) there was not a significant mortality of juvenile stock from fishing.

The size cockle on the proposed open beds are only in discrete locations and fishing will only occur in areas where the size cockle is at the greatest densities. Although there is size cockle on a large proportion of the beds much of the beds will remain unfished because the cockle density is not high enough to make it commercially viable to fish it. The area of cockle with more than 20 per m² size cockle is 180 hectares of a total of 6705 hectares of cockle bed, which equates to 2.7 % of the total cockle bed area, further reducing the impact on undersize cockle.

The maps above in section 3 show the distribution of each of the size classes of cockle at the survey station. In general the areas where the size cockle is at the greatest densities is not where the highest densities of undersize cockle is, therefore the areas where the undersize is at the greatest densities area likely to remain unfished.

When considering the impacts of fishing to other bivalves and molluscs, NWIFCA carry out a number of surveys on the cockle beds and the following observations are concluded: *Hydrobia* spp. are common species on the shore line but are often found in the upper reaches of the intertidal area and therefore away from the majority of the fishing activity; The bivalve *Limecola balthica* can be mixed in with cockles, but based on their morphology, the impacts of fishing would be very similar to that of juvenile cockle and would therefore be minimally impacted from fishing activity. No other species have been observed in significant numbers.

Therefore the NWIFCA can conclude that removal of non-target species will have no risk of adverse effect on the integrity or conservation status of the designated features within the site

iv. Abrasion, penetration and disturbance of the substrate - saltmarsh only

Newbiggin

There is no interaction between, parking, access or fishing with any saltmarsh feature, due to distance of the feature from fishery.

Flookburgh / Leven Sands

The main access to the fishery is via the hard core track off Moor Lane (West Plain). This access route is well established for tractor (shrimping) and quad bike access and has been used in the cockle fisheries for decades. There is very little risk if any of the saltmarsh being damaged. It is unlikely that any other route will be used.

Pilling Sands

The main access to the fishery is via the concrete track access point at Fluke Hall Lane as used in previous fisheries. There are very few other access points to this bed and as this is the easiest route to the fishery, and parking / tonning up areas exist there, it is likely to be the only access point used. This route is well-established and there is very little risk if any of the saltmarsh being damaged.

The Code of Practice for Intertidal Hand gathering highlights good practice in regard to avoiding damage to saltmarsh. It has also been stressed to industry the importance of avoiding damage to the saltmarsh and that the NWIFCA would consider closing the fishery if any damage occurs. The access will be monitored by NWIFCA officers.

Through implementation of management, sufficient monitoring, and the powers to close the fishery if damage occurs the NWIFCA is confident that there is no risk of adverse effect on the integrity or conservation status of the site.

6.2 SPA and Ramsar Features

- SPA and Ramsar birds

In addition to the 2017 HRA (NWIFCA-MB-EMS-2017) grey plover, dunlin, sanderling and turnstone have been highlighted as having a restore objective for the population targets.

6.2.1 Potential Impacts

i) Removal of target species (cockles) for all shore feeding SPA features that feed on infaunal molluscs.

Cockles form part of an important prey resource for eiders, oystercatchers and knot as well as forming part of a wide variety of prey items for many of the designated species including grey plover, dunlin, sanderling and turnstone. If bird populations are to be maintained in or restored to healthy condition, sufficient shellfish to meet their demands must remain for them.

The impact of removal of essential prey resource by fishing activity varies at different times of the year. For example, prey resource requirements are 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 in the spring prior to migrations 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 mainly eat larger-sized cockles, which are the target of the cockle fisheries. Although the birds can eat alternative prey species such as earthworms when shellfish are scarce, these prey often 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, Poot et al. (2014) suggests a modal size class of 9mm for knot when targeting cockles with a range of 4-13 mm

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.

ii) Removal of non-target species - for all shore feeding SPA features that feed on infaunal molluscs.

Infaunal molluscs form part of an important prey resource and form part of a wide variety of prey items for many of the designated species. The impact of removing an essential prey resource by fishing activity varies at different times of the year. For example, prey resource requirements are 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 additional resources to put on weight and get into best condition in the spring prior to migrations 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.

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

Visual disturbance could impact on 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. By mid-March some species, such as Redshank, will be establishing breeding territories on the saltmarsh and actively displaying.

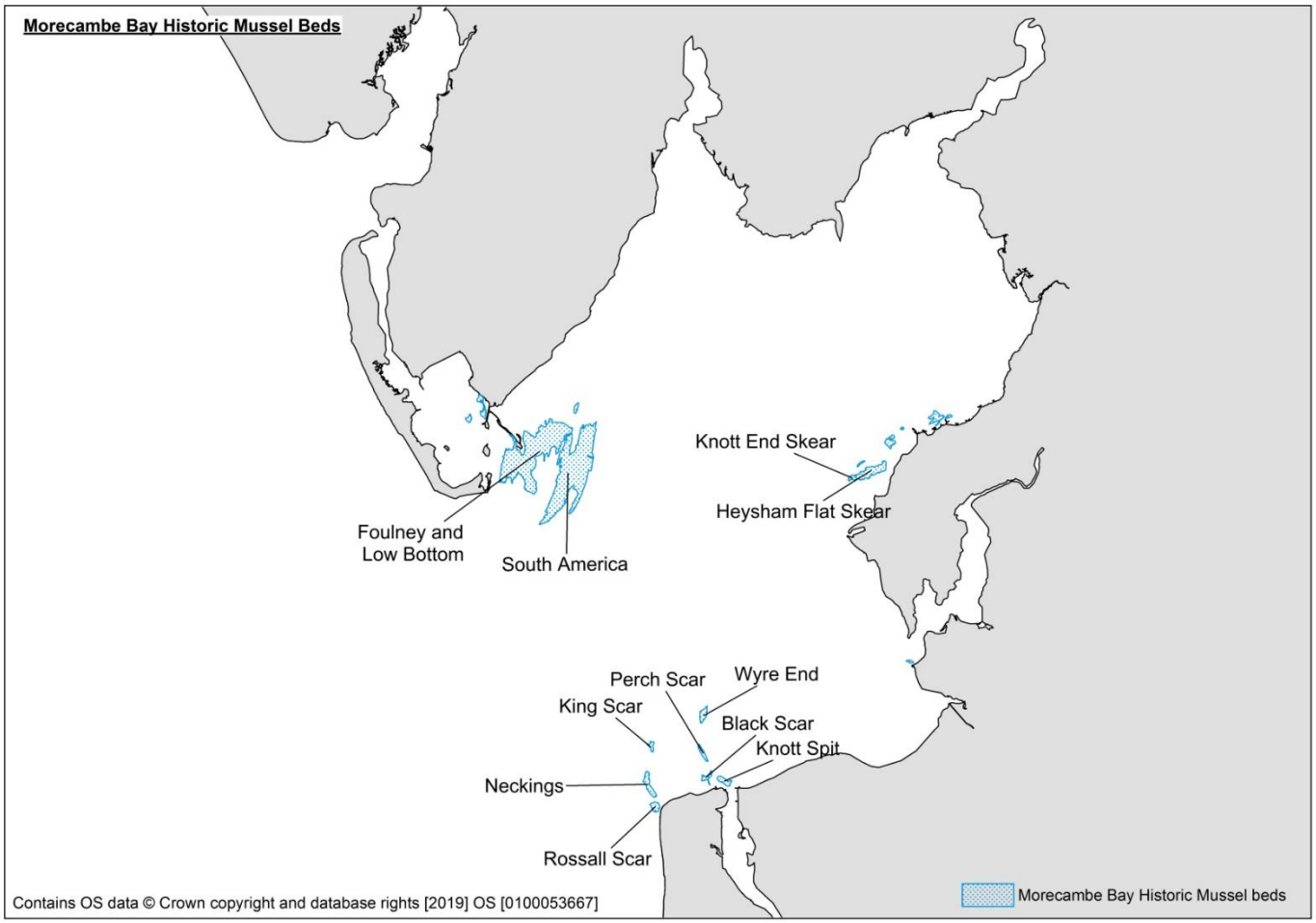
Disturbance caused by access to the fishery across the saltmarsh may reduce breeding success of this nationally declining species.

6.2.2 Exposure

i) Removal of target species (cockles) for all shore feeding SPA features that feed on infaunal molluscs.

A summary table of the cockle stocks has been provided in section 3 and section 6.1.2 (ii) above gives detailed information about the significant amount of cockle that will be left on closed cockle beds and the areas of unfished cockle beds which will be available for bird food requirements. Further to the above, the biomass figures from the surveys do not include estimates for under 5mm cockle due to the highly variable nature of cockle this size. Some of which will be within the 4-13mm size class suitable for knot to feed on. Enforcement of the minimum size of cockle within NWIFCA Byelaw 3 means undersize cockle will remain on the bed. Abundant cockle stocks are often absent from the Bay suggesting if they are present bivalve eating birds will utilise them but do not necessarily rely on them. Mussel beds in the site are more consistent and a likely to play a more constant role when it comes to bird food requirement. Below is a summary of the current condition of the mussel beds in Morecambe Bay.

The majority of the mussel beds in Morecambe Bay currently hold an abundant stock of mussels. A change from previous years is that this year there has been a significant increase in the amount of size mussel within Morecambe Bay, some of which has reached > 60mm in shell length. Also different is that the beds at Low Bottom and Foulney have not had a settlement, which could explain why the mussel there has grown on so much, as it has not been smothered in 2019 spat. Figure 3 shows the location of all Morecambe Bay Mussel beds.



Location of the historic mussel beds in Morecambe Bay

North Morecambe Bay

The majority of the larger mussel beds in north Morecambe Bay have been surveyed or inspected. Foulney, Foulney Island (surveyed 19th March 2019), Low Bottom (Surveys 25th March 2019) and the area of Foulney near the Walney Channel (surveyed 24th March 2019) have been surveyed using the Dutch Wand methodology and the estimates of biomass for size and undersize mussel have been provided in the table below. The surveys were done in early spring before any 2019 recruitment. The drying beds of South America and Falklands have been inspected on the 20th March 2019 and a summary provided below.

Summary of Dutch Wand surveys in North Morecambe Bay

Area	Date Surveyed	Estimated Area (ha)	Estimated Biomass of Size Mussel (t)	Estimated Biomass of Undersize Mussel (t)	Notes on Mussel Stock
Foulney Main Skear	19th March 2019	30	1278	2374	Very mixed stock across the bed with some areas of size mussel at low water along the northern edge of the skear. Some starfish present at low water level.
Foulney Island	19th March 2019	5	0	880	All mussel one year class majority of which is 25-35mm, sitting on a muddy sand - no scouring observed.
Low Bottom	25th March 2019	47	2175	2922	Mainly 25-45mm mussel with some area of predominantly size mussel near to low water mark and some areas of 10-25mm mussel mixed in on the eastern side of the bed. No starfish.
Walney Channel Area	24th March 2019	35	3091	1100	Area of mussel has increased along the western channel side of the bed from 2018, and most (approx 75%) of the stock has grown to size 45-60mm. The remaining stock falls into the 25-45mm size category with a small area of 10-25mm mixed in. Large numbers of starfish present along channel edge.

Summary of mussel bed inspections in North Morecambe Bay

Area	Date Inspected	Estimated Area (ha)	Notes on Mussel Stock
Falklands	20th March 2019	3	Mussel area has decreased since 2018. The majority of the remaining mussel is 25-40mm. The mussel is hard in on sand. There is an area of exposed cobble (4.2 ha) that has the potential to receive a settlement. Lots of starfish predation on the west side of the area.
South America	20th March 2019	The skear has sanded over and no cobble or boulder is visible.	

<u>Foulney mussel inspection - 20th June</u>

Foulney main skear was unchanged in bed area from the last survey, with no areas of scour observed. The mussel had grown to size across almost all of the skear and on the eastern side of the bed had clumped up. Members of industry present on site reported an increase in meat content to around 20%, compared to past average meat yields of 12%. Mussel at the southern extent of the skear was very large reaching ~60mm in length, although this was covered in green algae. Low numbers of starfish were observed along the south eastern edge of the skear.

No evidence of a 2019 spat settlement was observed anywhere on the main skear, which was consistent with reports from industry. Three samples were taken from the higher, middle and lower extents of the bed to examine for spat in the laboratory. These samples were passed through a 350µm sieve and the retained material examined under a dissection microscope. Very low levels (<10) juvenile mussels were observed in each sample examined.

Large numbers of birds were observed during the inspection, including several hundred eider, gulls, and a flock of ~50 Little Terns.

Officers visited the oyster frames on transit back to shore and there were two areas of patchy spat settlement on sand with some shell underneath, and on older frames that have not been cleaned. Conversation with men working the frames indicated that there had been no issues with mussel spat this year.

Heysham Flat and Outer Skears

No estimate of biomass has been given for Heysham Flat and the Outer Skears because of how quickly it can change with ephemeral mussel. It is likely that the majority of the mussel will be washed away by the winter storms with only a small percentage surviving. Below is a table of the mussel when last inspected.

Date	Mussel Stock Information
17th May 2019	**Great Out Skear** Patchy (~10%) 2019 spat coverage across most of this skear with two areas of more dense settlement (~70%). A small area of 2018 mussel was still present 25-30mm in length. **Little Out Skear** Not inspected due to lack of access but this skear appeared black and likely to have had a spat settlement.
8th July 2019	**Heysham Flat Skear** A few days of hot weather brought growth on fast since last inspection, with much of the stock now reaching 20-25mm. Some areas were clumped up and on dense layer of mud. A swathe across the southern part of the skear had already scoured out. Fishery was ready for opening. Metal marker posts that had been put in 6 days earlier to a depth of around 6" were in places almost buried to the top in mussel mud. **Knott End Skear** The eastern edge held mix of mussel and shell. However crossing to the mid and western edges showed large areas covered in dense mussel of around 20-25mm.

Fleetwood beds

Inspection carried out on 19th June 2019.

Black, Perch and Rossall Scar had a similar settlement of 2019 mussels, with the main parts of the beds having a density of between 30-80% coverage and 10-20% coverage on the edge of the beds. Black Scar was approximately 4.8 hectares in size, Perch Scar was approximately 10.9 hectares and Rossall Scar was approximately 7.4 hectares in size. The mussel was 5-10mm in size on Black and Perch Scars. All the beds had significant numbers of gulls observed feeding on them. Rossall Scar varied from Black and Perch Scars as there were patches of *Sabellaria alveolata* present which had also received the spat settlement.

The mussel on King Scar was patchier with areas of bare cobble. The 2019 spat settlement had grown larger in places ranging from 5-15mm and was mixed in with 20-30mm mussel. Areas of *Sabellaria alveolata* had mussel on them and there was an area of larger, barnacled mussel on the eastern side of the bed. The approximate area with mussel on was 9.2 hectares. There were significant numbers of gulls observed feeding on the bed.

Wyre End

Inspection carried out on 22th May 2019.

There has been a settlement of spat across much of the skear, apart for a muddy sand area to the east of the skear which has little to no spat present. Spat ranged in sizes across the skear, from pinprick to 5-8mm, with the larger spat near to the low water mark. The raised shingle bank had received no settlement and there were several large bare cobble areas. Clumps of larger 2018 mussel 20-40mm were patchily distributed, mainly in the northern and channel edge areas of the skear. There are some larger heavily barnacled size mussel present in the northern area. There is a strip of hard ground running along the channel edge south of the main skear and there were two areas where mussel was present: the mussel was mainly spat but a small patch of 2018 30mm mussel was present on one.

Although no specific figures have been given for the bird food requirements for bivalve eating birds from the summary of the cockle and mussel beds provided, NWIFCA is confident that the bird food requirements are met for the site by the current cockle and mussel stock across the Bay.

NWIFCA is confident that the removal of target species from the intertidal sand and muddy sand, mixed and coarse sediments supporting habitats will have no risk of adverse effect on the SPA features, which utilise cockle as a prey source and therefore have no risk of adverse effect on integrity or conservation status of the site.

ii) Removal of non-target species - for all shore feeding SPA features that feed on infaunal molluscs

The impact of the removal of non-target species has been assessed above in section 6.1.2 (iii) with no further management required due to the minimum impact of fishing activity on undersize cockle and other infaunal molluscs, which will be available as a prey source.

NWIFCA is confident that the removal of non-target species from the intertidal sand and muddy sand, mixed and coarse sediments supporting habitats will be minimal (if any) and therefore will have no risk of adverse effect on the SPA features, which utilise cockle as a prey source. There is therefore no risk of adverse effect on integrity or conservation status of the site.

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

The fishery will be prosecuted throughout the autumn, winter and possibly early spring months (1st September 2019 to 30th April 2020). Morecambe Bay is a vital over-wintering area for waders including cockle predating species such as oystercatcher and knot. Whilst surveying in 2018 Officers noted numbers of oystercatchers out on all the cockle beds, a sight that has been absent during years of low cockle stocks (Knott. M. pers. comm). There is subsequently a risk of disturbance to these birds during fishing activity, which will be focussed around low water times.

Disturbance to high tide roosting birds is very unlikely due to the timing of the fishery – ie. fishers will access the beach around three hours after high water and will have left the area around three hours before high water. Disturbance to birds utilising the top of the beach and surrounding saltmarshes will be limited by only having one access route on to the beds. These access routes are habitually used by dog walkers, other members of the public who walk out over the sands and by other fishing activities such as shrimping and intertidal netting. Birds are therefore likely to be habituated to a certain level of disturbance.

Disturbance will be minimised by vehicles only travelling to and from the fishery once each way per tide and via a low number of access points with the main access points being Fluke Hall Lane at Pilling, Moor Lane at Flookburgh / Leven Sands and from one of the access slips from the sea wall at Newbiggin. There are also large areas of the Bay that holds cockle and mussel of varying size ranges which will either not be open to fishing or parts of the open beds which contain very little size but high densities of undersize and therefore will not be targeted by gatherers. These will provide plentiful alternative area for birds to remain undisturbed.

The number of fishermen is anticipated to be low across the beds. At Flookburgh / Leven Sands the bed area is very large and fishers are likely to be working in small groups in the middle to low reaches of the bed which will minimise disturbance which is only likely to cause temporary and insignificant displacement as there will be large areas not being fished. Previous fisheries have shown that birds follow the tide out and when 'put up' they typically settle again rapidly and continue to feed (pers. observation. Knott. M. NWIFCA during Leasowe cockle fishery. 2010). Birds that are less sensitive to disturbance, such as oystercatchers, that target the larger cockle have been seen to be feeding very close to hand-gatherers at Flookburgh and may benefit from loose cockle on the sand after jumbo-ing (pers. comm. Knott M. 2018).

There is therefore no reason to suggest that disturbance to birds would be damaging unless weather was exceptionally severe. NWIFCA will carry out an assessment of risk in conjunction with Natural England during periods of cold weather and may close the fishery if cold weather is predicted to be below zero for more than 12 hours a day for 5 consecutive and advice is that fishing poses a risk to SPA features. If there is evidence of high levels of disturbance and a risk of adverse effect identified to the European Site then the NWIFCA Authority will

NWIFCA is confident that the risk of visual disturbance is low and that the fishery will have no risk of adverse effect on the SPA features, which utilise cockle as a prey source and therefore have no risk of adverse effect on integrity or conservation status of the site.

7. Summary of Enforcement and Monitoring of the Cockle Fisheries 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 site, a precautionary approach is being taken, and the following management measures implemented:

a) A multi-agency enforcement approach to ensure only legitimate permit holders commercially fish the bed (NB there is a 5kg per person daily personal consumption allowance for non-commercial gathering, and this will also be checked and enforced);
b) Flookburgh and Leven Sands cockle fisheries are closed to non-commercial gathering under NWIFCA Byelaw 3;
c) Rigorous enforcement of the MLS;
d) Closure of all other cockle beds under a Byelaw 16 closure;
e) Monitored landings through:

   i. Regular IFCO reporting of numbers fishing and estimates of quantities removed;

   ii. Monthly landings returns from Byelaw 3 permit holders (required under byelaw);

f) Monitoring and inspection to ensure no damage to the saltmarsh and that there are no litter issues;
g) NWIFCA enforcement officers will use intelligence and contacts with fellow enforcement agencies to pursue any suspicions of non-permitted or illegal cockling activity;
h) Use of the NWIFCA Compliance and Enforcement Strategy which defines how the NWIFCA will enforce local, national and international law. (https://www.nw-ifca.gov.uk/compliance-enforcement-strategy/)

NWIFCA in 2018 made the decision to close the previous fishery due to non-compliance with management. Indications are that industry are now much more aware of the firm stance of the Authority to any activity that could pose a risk of non-compliance with the HRA, and that they will act to do the same again should further risk be detected. The level of NWIFCA Enforcement devoted to these fisheries means non-compliance would be detected swiftly and reported back to the Authority immediately. This will deter non-compliance in the future.

Table 2: Summary of Impacts

Feature/Sub feature(s)	Conservation Objective	Potential pressure (such as abrasion, disturbance) exerted by gear type(s)	Potential ecological impacts of pressure exerted by the activity/activities on the feature *(reference to conservation objectives)*	Level of exposure of feature to pressure	Mitigation measures
Intertidal sand and muddy sand, intertidal mixed sediments, intertidal coarse sediment (Estuaries, Mudflats and sandflats not covered by seawater at low tide, Large shallow inlets and bays, SPA supporting habitats)	Maintain or restore the extent, distribution structure or function of the feature.	Litter	Littering impacts could include entanglement of fish and birds in the bags and sacks, and swallowing / entanglement of birds and mammals (both marine and terrestrial) of other litter.	Littering levels will be monitored, and fishers encouraged to act responsibly through Code Of Conduct for Intertidal Shellfisheries. NWIFCA will liaise closely with local authority and NE, for early detection of any problems.	None - current management measures sufficient with monitoring of the fishery
		Removal of target species	Removal of target species could change the invertebrate community composition of the sandbanks.	Number of beds remain closed which have significant cockle stock on them. All the beds have a significant amount of undersize cockle which will remain on the bed. Cockle fishers will be spread across a number of beds and only in discrete small areas on the beds where significant size cockle is present.	None - current management measures sufficient with monitoring of the fishery
		Removal of non-target species	Removal of target species could change the invertebrate community composition of the sandbanks.	Observation from NWIFCA study on breakage rates, only a small area that is likely to be fished, size cockle areas being geographically different from the area of the highest density of undersize cockle and other common species in different areas to cockle or morphologically similar to undersize cockle.	None - current management measures sufficient with monitoring of the fishery **With current management and monitoring, littering and removal of target species is unlikely to have an adverse effect on the integrity of the European Site.**
Saltmarsh	Maintain or restore the extent, distribution structure or function of the feature.	Litter	Littering impacts could include entanglement of fish and birds in the bags and sacks, and swallowing / entanglement of birds and mammals (both marine and terrestrial) of other litter.	Littering levels will be monitored, and fishers encouraged to act responsibly through Code Of Conduct for Intertidal Shellfisheries. NWIFCA will liaise closely with local authority and NE, for early detection of any problems. The fishery will be closed if littering is a problem.	None - current management measures sufficient with monitoring of the fishery
		Abrasion/disturbance of the substrate on the surface of the seabed	Potential to effect the:- - Extent and distribution	Established access points to the bed from previous cockle fisheries. Access and saltmarsh will be monitored and	None - None - current management measures

		Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion	- Presence and spatial distribution of saltmarsh communities - Presence and abundance of typical species - Species composition of component communities - Sediment composition and distribution	fishers encouraged to act responsibly through Code Of Conduct for Intertidal Shellfisheries. NWIFCA will liaise closely with local authority and NE, for early detection of any problems.	sufficient with monitoring of the fishery **With current management and monitoring, littering and removal of target species is unlikely to have an adverse effect on the integrity of the European Site.**
- *Somateria mollissima*; Common eider - *Haematopus ostralegus*: Eurasian oystercatcher - *Calidris canutus*; Red knot shore feeding SPA features that feed on infaunal molluscs	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 (cockles)	Potential to effect the:- - Food availability - Condition and survival of SPA species Abundance of SPA species	Number of beds remain closed which have significant cockle stock on them. All the beds have a significant amount of undersize cockle which will remain on the bed. Cockle fishers will be spread across a number of beds and only in discrete small areas on the beds where significant size cockle is present	None - current management measures sufficient with monitoring of the fishery
		Removal of non-target species	Potential to effect the:- - Food availability - Condition and survival of SPA species Abundance of SPA species	Observation from NWIFCA study on breakage rates, only a small area that is likely to be fished, size cockle areas being geographically different from the area of the highest density of undersize cockle and other common species in different areas to cockle or morphologically similar to undersize cockle.	None - current management measures sufficient with monitoring of the fishery **With current management as described, removal of target species is unlikely to have an adverse effect on the integrity of the European Site.**
- *Egretta garzetta;* Little egret - *Cygnus Cygnus*; Whooper swan - *Anser brachyrhynchus*; Pink-footed goose - *Tadorna tadorna*; Common shelduck - Anas Penelope; Wigeon - *Anas acuta*; Northern pintail - *Somateria mollissima*; Common eider - Bucephala clangula; Goldeneye	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 effect the:- - Condition and survival of SPA species - Abundance of SPA species - Extent and distribution of supporting habitat available whilst a fishing activity is occurring	Disturbance to high tide roosting birds is very unlikely due to the timing of the fishery Disturbance will be minimised by vehicles only travelling to and from the fishery once each way per tide and via a low number of access points with the main access points being Fluke Hall Lane at Pilling and Moor Lane at Leven and Flookburgh. Birds may benefit from loose cockle on the sand after jumbo-ing. Cold weather closure in place	None - current management measures sufficient with monitoring of the fishery **With current management as described, visual**

Mergus serrator; Red-breasted Merganser *Haematopus ostralegus*; Eurasian oystercatcher *Charadrius hiaticula*; Ringed plover *Pluvialis apricaria*; European golden plover *Pluvialis squatarola*; Grey plover *Vanellus vanellus;* Lapwing *Calidris canutus*; Red knot *Calidris alba*; Sanderling *Calidris alpina alpina*; Dunlin *Calidris pugnax;* Ruff *Limosa limosa;* Black-tailed godwit L*imosa lapponica*; Bar-tailed godwit *Numenius arquata*; Eurasian curlew *Tringa totanus*; Common redshank *Arenaria interpres*; Ruddy turnstone L*arus melancephalus;* Mediterranean gull *Phalacrocorax carbo;* Cormorant *Podiceps cristatus;* Great crested grebe Seabird assemblage Waterbird assemblage *Larus fuscus*; Lesser black-backed gull *Larus argentatus*; Herring gull *Sterna sandvicensis*; Sandwich tern *Sterna hirundo*; Common tern *Sterna albifrons*; Little tern					**disturbance is unlikely to have an adverse effect on the integrity of the European Site.**

7. Conclusion

The proposal is to open Newbiggin, Flookburgh / Leven Sands and the east side of Pilling Sands cockle beds, Morecambe Bay, to removal of size cockles in a hand-gathered cockle fishery, to open 1st September 2019 until the start of the 2020 closed season on 1st May 2020 unless closed by NWIFCA prior to this date for management reasons. The reason for closing part of Pilling Sands is because there are some clear differences between the east and the west of the bed. The area east of the access slipway contains the majority of size cockle and the area where size cockle density is highest. The area west of the slipway consists of higher densities of juvenile cockle and lower densities of size cockle.

The current management measures incorporated into this fishery, and the use of an effective enforcement team of NWIFCA Officers with multi-agency support, allows the NWIFCA to conclude that the hand-gathered cockle fishery at Newbiggin, Flookburgh / Leven Sands and the east Side of Pilling Sands will have no risk of adverse effect to the integrity of the European Site.

8. In-combination assessment

a) Other ongoing and authorised fisheries:

Heysham Flat Seed Fishery – fishing has not started and it is unlikely to start once the cockle fisheries have opened.

Size mussel fisheries – there is a low level of activity on the size mussel fishery on Foulney near the Walney Channel side of the skear. Typically, effort on these fisheries is low (around ten gatherers). If effort increases on the mussel fishery then it will decrease in the cockle fishery.

Tractor shrimp fishery – currently the shrimp fishing is poor, and there is a reduced level of effort. Effort is likely to be concentrated on the cockle fishery with some fishing for shrimps and cockle fishing on the same tide.

b) Assessment

Due to the low levels of mussel harvesting impacts on habitats and disturbance levels to birds are considered to have No Likely Significant Effect on the conservation features. Removal of the mussel resource is minimal with large reserves remaining as bird prey resource at a time of year when over-wintering birds are returning. ***For these reasons NWIFCA is confident that the cockle fishery will have No Likely Significant Effect on any conservation features.***

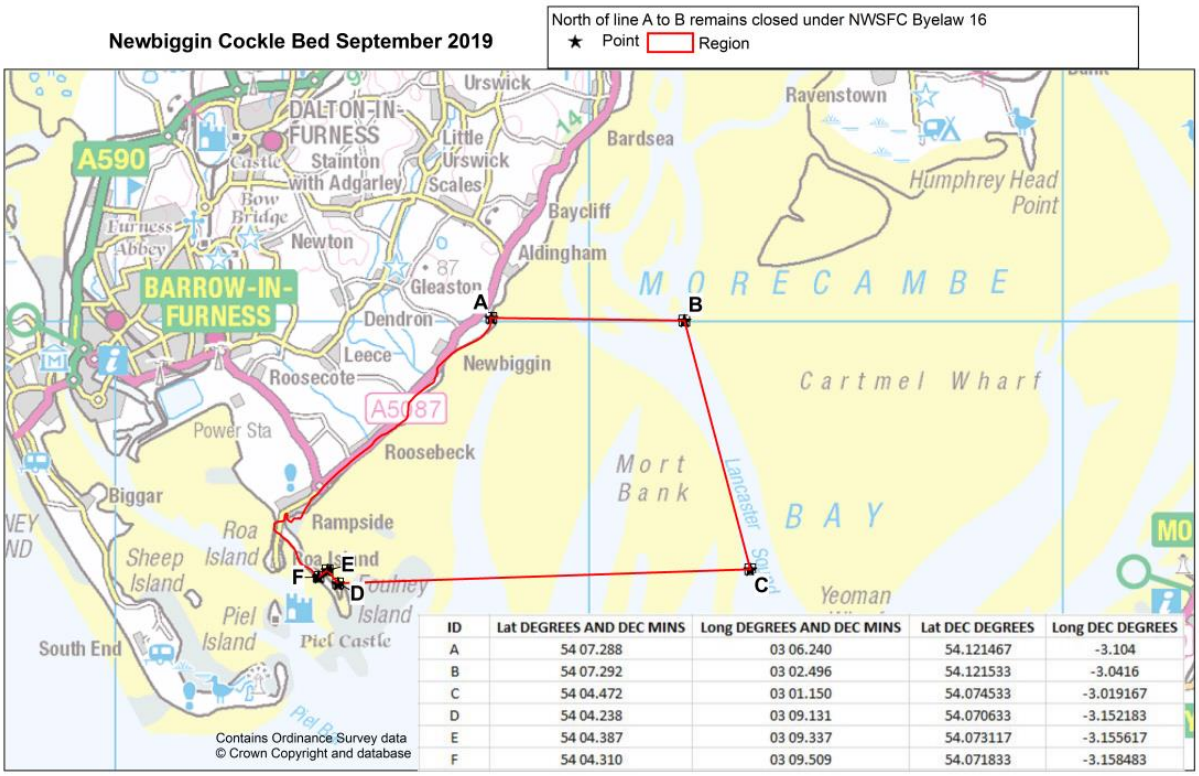
The shrimp fishery in Morecambe Bay has undergone a separate HRA which assessed travel to and from the fishery. This HRA concluded No Risk of Adverse Effect on the Integrity of the European Site. After December the main activity within the shrimp fishery has finished and there is likely to be little shrimp fishing while the cockle fishery is open. ***Combined with the current reduced effort in the shrimp fishery NWIFCA can conclude No Likely Significant Effect from the cockle fishery on any conservation features.***

Considering in combination effects of the mussel, shrimp and cockle fisheries in the Bay, the NWIFCA can conclude No Risk of Adverse Effect on the Integrity of the European Site.

9. Integrity test

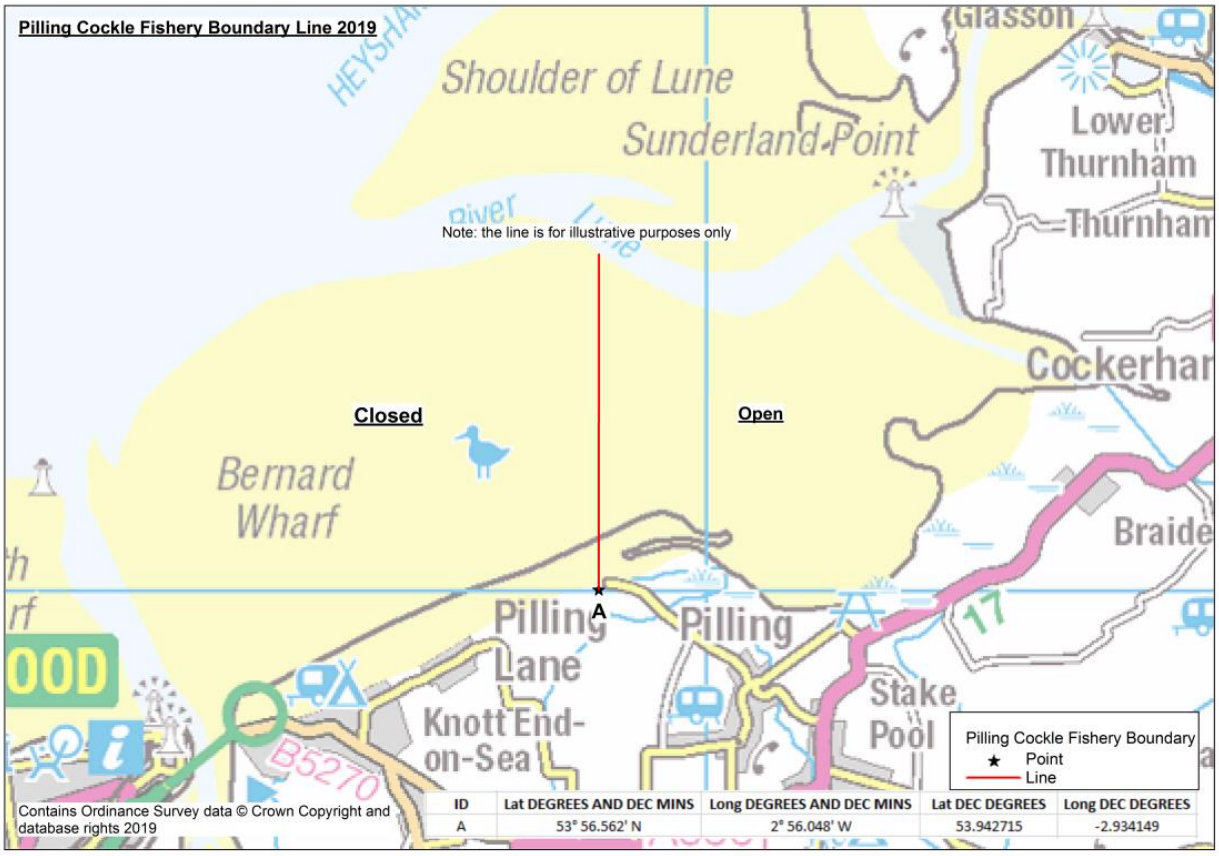
The NWIFCA concludes No Risk of Adverse Effect on the Integrity of the European Site of the Flookburgh / Leven

Maps of Cockle Beds to Open on 1st September 2019



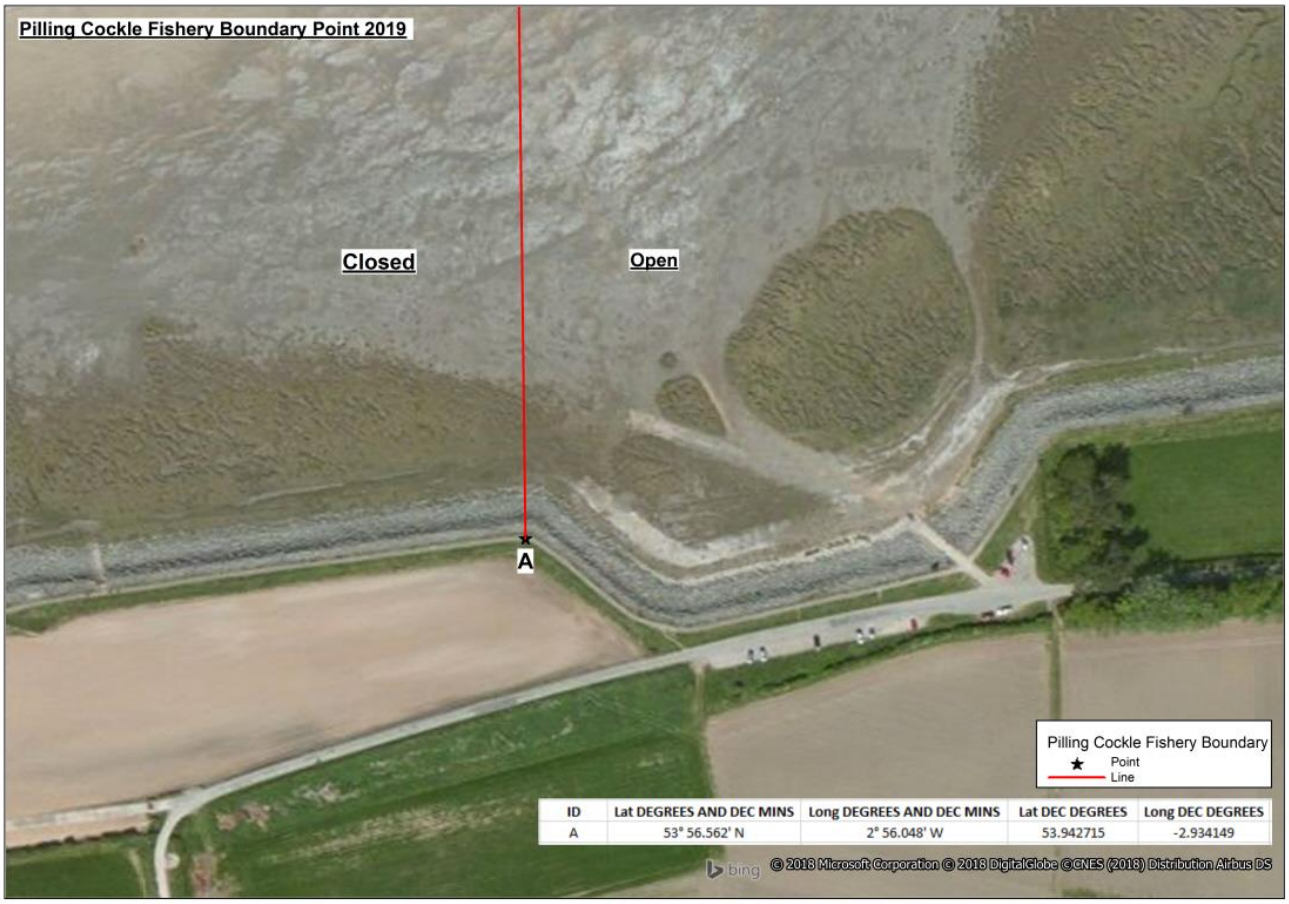
ID	Lat DEGREES AND DEC MINS	Long DEGREES AND DEC MINS	Lat DEC DEGREES	Long DEC DEGREES
A	54 07.288	03 06.240	54.121467	-3.104
B	54 07.292	03 02.496	54.121533	-3.0416
C	54 04.472	03 01.150	54.074533	-3.019167
D	54 04.238	03 09.131	54.070633	-3.152183
E	54 04.387	03 09.337	54.073117	-3.155617
F	54 04.310	03 09.509	54.071833	-3.158483

Newbiggin Cockle Bed showing delineation with Aldingham bed which remains closed under NWSFC Byelaw 16



ID	Lat DEGREES AND DEC MINS	Long DEGREES AND DEC MINS	Lat DEC DEGREES	Long DEC DEGREES
A	53° 56.562' N	2° 56.048' W	53.942715	-2.934149

Pilling Cockle Bed showing line dividing east (open) and west (closed under NWSFC Byelaw 16) areas



Google Earth image showing line dividing open and closed areas on Pilling Cockle Bed

Annex B: Natural England's Consultation Advice

Date: 15 August 2019
Our ref: 291695

NATURAL ENGLAND

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BY EMAIL ONLY

Dear Mandy,

Morecambe Bay Cockle Fisheries Habitats Regulations Assessment 1st September 2019 – 30th April 2020

Thank you for your email dated 07 August 2019 on the above Habitats Regulations Assessment (HRA) for the opening of the Flookburgh/Leven Sands, Pilling, and Newbiggin cockle beds. The following constitutes Natural England's formal statutory response.

Internationally and nationally designated sites

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 Morecambe Bay Special Area of Conservation (SAC) and Morecambe Bay and Duddon Estuary Special Protection Area (SPA), which are European sites. The site is also listed as Morecambe Bay Ramsar site[1] and also notified at a national level Morecambe Bay Site of Special Scientific Interest (SSSI) and Lune SSSI.

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 (AEOI) of any of the sites in question. Natural England advises that 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.

Appropriate Assessment considers the relevant in-combination plans and projects, in this case other intertidal shellfisheries in Morecambe Bay. 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. See Annex A for further details.

While Natural England agrees with the conclusions of the Appropriate Assessment, we request that the following comments are addressed:

- Substantive change

Can the HRA include 'Abrasion, penetration and disturbance of the substrate' in the appropriate assessment for the feature 'Sandflats and Mudflats not covered by sea water all the time' for the sub features 'Intertidal sand and muddy sand' and 'Intertidal sand'. This is in light of the discussions that took place in 2018 regarding the risk of breakage and damage of undersize cockle found in amongst size cockle which are being fished and which supported the use of cram over rake as a fishing technique. We need to be sure that the action of fishing retains a healthy un-damaged infauna of other species namely other small cockle, small bivalves, molluscs and soft bodied organisms. Is there some feedback from the breakage study the NWIFCA undertook or other knowledge you have which can rule out this risk?

- Minor changes

6.2.2 Exposure i) – We agree with the assumption that knot target small undersize cockle meaning their prey resource will be largely remain unaffected and there will be adequate feeding areas located away from the fishermen's main target areas. This sections states that the 0-5mm size class is the size knot typically feed on. We are not confident that this is correct: Poot et al. (2014) suggests a modal size class of 9mm for knot when targeting cockles with a range of 4-13 mm (paper attached).

Page 27 – Visual disturbance. You state "Birds have also been seen to be feeding very close to hand-gatherers at Flookburgh and may benefit from loose cockle on the sand after jumbo-ing (pers. comm. Knott M. 2018)." We agree with this statement however it should be clarified that it tends to be birds that are less sensitive to disturbance and less prone to take flight, that feed close to the fishermen namely oystercatcher. However as oystercatcher are the birds most likely to be targeting the areas of large cockle where fishermen are active, it is thus still a useful statement.

For any queries relating to the content of this letter please contact me using the details provided below.

Yours sincerely,

Katherine Nisbet
Marine Lead Adviser – Cumbria Area Team

Email: Katherine.Nisbet@naturalengland.org.uk
Tel: 07917474331

Annex A

Natural England agree with the conclusion in the HRA of No Adverse Effect on Site Integrity, based on the following principles:

- Only size cockle is taken with the majority of cockles on the beds undersize, which is the feeding target for SPA birds. These small cockles are preserved and kept on the beds retaining the feeding resource for the birds

- There are other cockle beds which have significant amounts of undersize cockle in the Bay, these will remain unfished and act as alternative feeding areas where disturbance is an issue on the fished beds.

- Cockles represent only a portion of the diet of SPA birds, other food resources (e.g. Macoma, Polychaetes, Hydrobia) remain unaffected.

- Observations show that birds show only temporary disturbance to the movement of fishers and return quickly to feeding on areas of the cockle beds around the fishermen.

Further to the advice above it was agreed on the 26th August 2019 to assess the substantive change of the potential impact on undersize cockle and other infaunal mollusc in the **Removal of Non-Target Species** rather than **Abrasion, Penetration and Disturbance of Sediment** as it follows previous HRAs NWIFCA have completed for other fishing activities within European Sites.