Morecambe Bay Cockle Fisheries Habitats Regulations Assessment 13th September 2021 - 30th April 2022

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 September 2020, 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**, the January 2019 fishery **Morecambe Bay Cockle Fisheries January 2019, Morecambe Bay Cockle Fisheries September 2019** and **Morecambe Bay Cockle Fisheries September 2020** is also available. All of the HRAs can be found at: <u>https://www.nw-ifca.gov.uk/marine-protected-areas/hra/</u>

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.

Information provided by Natural England within the formal advice (6th September 2021)

The latest WeBS data for Morecambe Bay (covering the winter of 19/20) showed a marked decrease in the populations of many species compared to the year before such that the Assemblage total for the site has fallen by c60,000 birds (29%) on the value for the previous winter (18/19). Based on current evidence it cannot be determined whether or not the decline is linked to fisheries within Morecambe Bay, although many of the species that have individually declined may potentially interact with shellfisheries. Some notable species of concern present in the fishery area include:

- Pink-footed goose (pilling Sands roost) decline c10,000 individuals
- Knot (feed on juvenile cockle and Macoma on Pilling sands) decline c9000 individuals
- Herring Gull (feed on bivalves) decline c6000 individuals
- Bar-tiled Godwit (main feeding ground Pilling Sands) decline c2000 individuals
- Grey Plover (main feeding ground Pilling Sands) decline c500 individuals

Although Eider have declined they are largely a feature of other areas of the Bay than the Pilling area so are low risk in the context of this specific proposal. Of the key species of concern to this HRA only oystercatcher appears to have held its numbers, however, oystercatcher are very site loyal and will often stay put and risk being unable to secure adequate food resource with a consequent loss of fitness than move onto different sites if food resources are limited.

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 137 NWIFCA Byelaw 3 permits which could be issued for the 2020 – 2021 season and a maximum of 147 permits which could be issued for the 2021 – 2022 season.

NWIFCA are currently in the process of replacing the current byelaw with a new byelaw NWIFCA Byelaw 3 (2020) which if it comes into force during the 2021 – 2022 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 manage the fishery.

3. Current Status of main Cockle Stocks within Morecambe Bay

This year surveys have been completed in May rather than July, this is due to having the data available to make a decision on opening the cockle beds early due to the issue caused by the UK leaving the EU and the impact of the covid pandemic to assist industry through a difficult period. Due to the early survey there are a number of considerations. It is expected that biomass figures would be lower than if survey were completed in July as the cockles are likely to be in poor condition and have yet to grow through the summer months. There will be limited data on this year's settlement although the adult cockle will have spawned. The lack of data on the less than 5mm cockle is not going to effect the biomass figures significantly as less than 5mm cockle are not used in the undersize density or biomass figures due to the highly variable nature of survivability.

Means were calculated from all stations with zero counts on the edge 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.

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).

Biomass, size cockle¹ defined as cockle which will not pass through a square gauge 20 x 20mm in size. The biomass of undersize cockle² does not include any estimates of cockle less than 5mm due to the high variability of survival of this size class.

Aldingham and Newbiggin Cockle Survey 20-05-21

63 stations were sampled, 56 from a 500m grid and 7 additional stations were added to ensure full coverage of the cockle bed. A number of stations, particularly in the North East section of the bed, could not be accessed due to changes in the Leven channel. There was a wide range of cockle sizes across the bed from less than 5mm to greater than 35mm cockle. Cockle densities were relatively low across the bed with higher densities of size and undersize cockles found on Newbiggin. Cockles from the 0-5mm class were not present across the majority of the bed and only found in very low densities at two stations which is likely due to the timing of the survey.

Mean number of size cockle	10 per m ²	(min 0, max 42)
Mean number of undersize cockle	7 per m²	(min 0, max 62)
Mean number of 0-5mm cockle	<1 per m ²	(min 0, max 4)

Biomass	Area (ha)	Size Cockle (tonnes) ¹	Undersize Cockle (tonnes) ²
Aldingham and Newbiggin	1305	~1800-1900	~200-300



Illustration of position of Aldingham and Newbiggin Survey Area



Density of size cockle per m² Aldingham and Newbiggin May 2021



Density of undersize cockle per m² Aldingham and Newbiggin May 2021



Density of 0-5mm cockle per m² Aldingham and Newbiggin May 2021



Frequency of size classes of cockle per m² Aldingham and Newbiggin May 2021

Leven Cockle Survey 12-05-21

74 stations were sampled from a 500m grid. There was a wide range of cockle sizes across the bed from less than 5mm to greater than 35mm cockle. The densities of both size and undersize cockle across the bed were relatively low. Size cockle were present across the surveyed area. Undersize cockle was present in higher densities with higher numbers found towards the south western part of the bed. Low densities of 2021 spat were found across the centre of the bed area but this was not consistent across the bed.

Mean number of size cockle	5 per m²	(min 0, max 22)
Mean number of undersize cockle	11 per m ²	(min 0, max 58)
Mean number of 0-5mm cockle	3 per m ²	(min 0, max 30)

Biomass	Area (ha)	Size Cockle (tonnes) ¹	Undersize Cockle (tonnes) ²
Leven	1319	~600-700	~125-150



Illustration of position of Leven Survey Area



Density of size cockle per m² Leven May 2021



Density of undersize cockle per m² Leven May 2021



Density of 0-5mm cockle per m² Leven May 2021



Frequency of size classes of cockle per m² Leven May 2021

Flookburgh Cockle Survey 11/12-05-21

123 stations were sampled from a 500m grid. A number of sample points within the grid were unable to be sampled due to changes in the channels on the bed. There was a wide range of cockle sizes across the bed from < 5mm to > 35mm. Cockle density was inconsistent across the bed and relatively low in comparison with recent years. There was little evidence of any 2021 settlement which is to be expected due to the timing of the survey. A denser area with a variety of size classes was evident in the North West of the survey grid.

Mean number of size cockle	4 per m ²	(min 0, max 28)
Mean number of undersize cockle	7 per m²	(min 0, max 36)
Mean number of 0-5mm cockle	2 per m ²	(min 0, max 40)

Biomass	Area (ha)	Size Cockle (tonnes) ¹	Undersize Cockle (tonnes) ²
Flookburgh	2240	~900-1000	~175-225



Illustration of position of Flookburgh Survey Area



Density of size cockle per m² Flookburgh May 2021.



Density of undersize cockle per m² Flookburgh May 2021.



Density of 0-5mm cockle per m² Flookburgh May 2021.



Frequency of size classes of cockle per m² Flookburgh May 2021.

Warton Sands Cockle Survey 01-06-21

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49 survey stations were sampled from a 250m grid. Sample density was increased to include an additional 6 stations where there was a previously known area of dense cockle. The majority of the survey area was accessible with some survey stations being cut by channels and soft areas. The high density area that was surveyed in 2019 and 2020 was present over a slightly smaller area with lower densities of size and undersize cockle. Size cockle was in low density across the main surveyed bed area and the majority of the dense area had grown to size. 2021 spat was not present across the bed which is likely due to the timing of the survey. No cockles larger than 35mm were found.

3 per m ²	(min 0, max 34)
5 per m ²	(min 0, max 14)
73 per m ²	(min 0, max 230)
17 per m ²	(min 6, max 38)
	3 per m ² 5 per m ² 73 per m ² 17 per m ²

Biomaas	Area (ha)	Size Cockle (tonnes) ¹	Undersize Cockle (tonnes) ²
Warton Sands	181.8	~55	~15-20
Main Area	8.4	~50-55	>5

Warton Sands		
Dense Area		



Illustration of position of Warton Sands cockle bed





Density of undersize cockle per m² Warton Sands June 2021



Frequency of size classes of cockle per m² Warton Sands June 2021

Pilling Sands Cockle Survey 19-05-21

69 stations were sampled from a 500m grid. Three additional stations was added to ensure full coverage of the cockle bed. There was a relatively low density of size cockle across much of the bed with an areas of higher density size cockle in the centre of the bed. There were low densities of undersize cockle across the majority of the bed. There were no signs of a 2021 cockle spat which is likely due to the timing of the survey.

Mean number of size cockle	17 per m ²	(min 0, max 120)
Mean number of undersize cockle	5 per m²	(min 0, max 44)
Mean number of 0-5mm cockle	0 per m ²	(min 0, max 0)

Biomass	Area (ha)	Size Cockle (tonnes) ¹	Undersize Cockle (tonnes) ²
Pilling Sands	1434	~2200-2300	~150-200



Illustration of position of Pilling Sands Survey Area



Density of size cockle per m² at Pilling Sands July 2021



Density of undersize cockle per m² at Pilling Sands July 2021



Frequency of size classes of cockle per m² at Pilling Sands July 2021

Middleton Cockle Survey 21-05-21

78 stations were sampled from a 350m grid. The densities of both size and undersize cockle across the bed were relatively low. Cockle from the 0-5mm size class was only found at 3 stations which is likely due to the timing of the survey.

Mean number of size cockle	7 per m²	(min 0, max 44)
Mean number of undersize cockle	4 per m ²	(min 0, max 22)
Mean number of 0-5mm cockle	<1 per m ²	(min 0, max 4)

Biomass	Area (ha)	Size Cockle (tonnes) ¹	Undersize Cockle (tonnes) ²
Middleton Sands	601	~400-450	~40-55



Illustration of position of Middleton Sands cockle bed



Density of size cockle per m² Middleton Sands May 2021



Density of undersize cockle per m² Middleton Sands May 2021



Density of 0-5mm cockle per m² on Middleton Sands May 2021



Frequency of size classes of cockle per m² Middleton Sands May 2021

Tables 1 & 2 show survey results for Morecambe Bay Cockle Stocks 2021, 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)
Newbiggin	Total	48	999	40	34 (85%)	33 (82.5%)	7 (17.5%)	175 (17.5%)	1600-1700	200-300
Aldingham	Total	15	306	15	12 (80%)	12 (80%)	1 (6.6%)	25 (8%)	250-300	25-50
Leven	Total	74	1319	54	50 (93%)	36 (67%)	3 (6%)	75 (6%)	600-700	125-150
Flookburgh	Total	123	2240	89	77 (87%)	56 (63%)	2 (2%)	50 (2%)	900-1000	175-225
Warton	Main Area	47	181.8	30	24 (80%)	18 (60%)	0 (0%)	0 (0%)	55	15-20
Walton	Dense Area	8	8.4	8	8 (100%)	7 (88%)	6 (75%)	6.5 (77%)	50-55	>5
Middleton	Total	78	601	49	31 (63%)	43 (88%)	3 (6%)	36.75 (6%)	400-450	40-55
Pilling	Total	72	1434	58	29 (50%)	56 (97%)	18 (31%)	450 (31%)	2200-2300	150-200
TOTAL			7089.2						6005-6560	735-1005

	Size	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean Density Size
	(mm)	Density	Density	Density	Undersize	Undersize	Undersize	Size per	Size per	per m ²
	()	cockle	cockle	cockle	per m ²	per m ²	per m ²	m ²	m ²	
Cockle Bed		per m ²	per m ²	per m ²						
Newbiggin	5 to 35+	0	0	0	0	62	10	0	42	12
Aldingham	0 to 35+	0	<1	4	0	12	3	0	26	7
Leven	5 to 35+	0	30	3	0	58	11	0	22	5
Flookburgh	0 to 35+	0	40	2	0	36	7	0	28	4
Warton (Main Area)	5 to 35	0	0	0	0	14	5	0	34	3
Warton (Dense Area)	5 to 35	0	0	0	6	38	17	0	230	73
Middleton	0 to 35+	0	<1	4	0	22	4	0	44	7
Pilling	5 to 35+	0	0	0	0	44	5	0	120	17

4. Proposal

The proposal is to open Pilling Sands and Newbiggin, Morecambe Bay, to removal of size cockles to hand-gathering; Pilling Sands to open 13th September 2021 until the start of the 2022 closed season on 1st May 2022 unless closed by NWIFCA prior to this date for management reasons. The proposal was originally for Pilling Sands to open within the NWIFCA Byelaw 3 close season in 2021 which runs from 1st May to 31st August to relieve the pressure from the UK leaving the EU causing a significant reduction in the ability for cockle to be exported. The proposal will be for the fishery to open in September. The original proposal for an early opening was hoped to increase the possibility of cockles going for canning, due to the meat content of the cockles be higher in late summer before it start to decrease in the winter. A map illustrating the Newbiggin cockle fishery area has been provided in Annex A.

Flookburgh, Leven, Middleton and Warton were closed 1st September under NWSFC Byelaw 13A due to lack of a stock. Aldingham will remain closed as it is within a prohibited hygiene classification area after a very high E.coli reading in 2020.

NWIFCA Technical, Science and Byelaw Committee met on 30th June 2021 to discuss management of the Morecambe Bay cockle beds. The reports for the meeting are available on the NWIFCA website and minutes will be published when available (<u>https://www.nw-ifca.gov.uk/meetings-archive/</u>). Officers produced the report, Morecambe Bay Cockle and Mussel Fishery Report June 2021 which contained data on all Morecambe Bay cockle beds. The officer recommendation was that all cockle beds in Morecambe Bay remain closed for the rest of NWIFCA Byelaw 3 cockle close season and that on the 1st September 2021, implement NWSFC 16 closure on all cockle beds in Morecambe Bay. The reason for the recommendation was that although there is an estimated 6005-6460 tonnes of size cockle and 710-955 of undersize cockle this is a significant reduction in cockle stocks compared to the last 4 years when cockle beds have been opened. Officers had concerns over the potential recruitment of cockles in the coming years if stock was fished. Significant discussion took place of the potential unknown location of cockle spawning stock, that the cockle had already spawned this year and the potential of the adult cockles surviving until spring 2022 when spawning would take place, and the predicted fishing effort when considering what other cockle fisheries are open in the UK and the density of cockle.

Although there is fishable stock on Pilling Sands and Newbiggin officers recommendation was to leave the stock unfished where it was at the highest density to spawn in spring 2022 and because many of the other beds had low densities of stock and there was a lack of juvenile stock on all beds. Officers highlighted the uncertainty of the location of the Morecambe Bay spawning stock and that recruitment is highly dependable on environmental factors. The reasoning for the concerns of officers not being shared by members of TSB are outlined.

- The spawning stock could come from anywhere in the Irish Sea for example other cockle beds in the NWIFCA district and those from North Wales.
- There is no proven direct correlation between leaving cockles in significant biomass and the following year's recruitment.
- The adult cockles have already spawned in 2021 and it is uncertain if the cockles will survive until spring 2022 to spawn again.
- Cockles are highly fecund.
- Fishing effort is likely to be relatively low after the initial few days of the fishery being open due to the density of the size cockle and other fisheries that are open around the UK.

Members voted to open Pilling Sands as soon as possible and consider the opening of Newbiggin on 1st September 2021. Both resolution where subject to the fishery being HRA compliant.

This assessment has been produced by NWIFCA officers using both the reasoning and judgement of NWIFCA officers, as well as the reasoning and judgement used in the NWIFCA TSB meeting to open Pilling Sands and Newbiggin.

5. Test for Likely Significant Effect (LSE)

The following additions have been added to TLSE table and taken through to appropriate assessment as well as the features and pressure listed 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. Although concerns have been raised regarding specific SPA features due to low bird count data observed in the latest WeBS data, all species have already been taken through to appropriate assessment.

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. <u>Removal of target species - Intertidal sand and muddy sand, mixed and coarse sediments only</u>

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. <u>Removal of non-target species - Intertidal sand and muddy sand, mixed and coarse sediments only</u>

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. <u>Litter</u>

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 Duddon Sands, Half Moon Bay, and Cockerham Sands.

The proposal is to open Newbiggin and Pilling Sands cockle beds in Morecambe Bay to hand gathering. All other beds would be closed under NWSFC Bylaw 13A, Cockle and Mussels – Management of the Fishery, 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 with some areas of denser size cockle on Newbiggin and Pilling.
- There are low densities of undersize cockle across all beds.

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 137 NWIFCA Byelaw 3 permits which could be issued for the 2020 – 2021 season and a maximum of 147 permits which could be issued for the 2021 – 2022 season. It is predicted from the stock information, communication with permit holders, and information about other open cockle fisheries in other parts of the UK and from officers' experience of Morecambe Bay cockle fisheries since 2016, that there are only likely to be 20-60 active permit holders fishing at any one time across all of the open beds combined.

Flookburgh, Leven, Middleton, Warton and Aldingham with a stock on it 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)
Aldingham	306	250-300	25-50
Leven	1319	600-700	125-150

Flookburgh	2240	900-1000	175-225
Warton	190	105-110	15-25
Middleton	601	400-450	40-55
TOTAL	4656	2255-2560	380-505

In addition to what will be left unfished on the closed beds there will be some biomass of undersize on the beds that will open: Newbiggin 200-300 tonnes and Pilling 150-200 tonnes. Although some of the undersize cockle will grow and reach size before or during the fishery some 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 625 hectares of a total of 2433 hectares of cockle bed, which equates to 25.7 % of the total open cockle bed area. From the 2019/2020 and 2020/21 fisheries nearly all of the fishing occurred in a small area on Flookburgh, once this area had been fished and the density reduced the majority of cockle fishing stopped and although there was size cockle above 20 per m² on Flookburgh and many of the other open cockle beds in Morecambe Bay, these were not fished. Therefore a much smaller area than this will be fished as it will only be the areas where there is a greater density of cockle that will be fished.

Further analysis on the potential impact has been carried out by Natural England in review of the HRA from additional information provided by NWIFCA on previous year's stocks when a fishery has been opened and from yearly landings data on each bed. The conclusions have been summarised within the formal advice provided in Annex B.

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. <u>Removal of non-target species - Intertidal sand and muddy sand, mixed and coarse sediments only</u>

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 observations can be drawn from the data collected. There was no significant numbers 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 no significant mortality of juvenile stock from fishing. NWIFCA Byelaw 3 close season is for the protection of adult cockles whilst spawning and for the protection of juvenile cockle when it has newly settled. Although the proposal for Pilling is to open towards the end of the close season, the adult cockle will have already spawned and risk to juvenile cockles is not considered to be higher than it would be on the 1st September.

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 625 hectares of a total of 2433 hectares of cockle bed, which equates to 25.7 % of the total open cockle bed area. From the 2019/2020 and 2020/21 fisheries nearly all of the fishing occurred in a small area on Flookburgh; once this area had been fished and the density reduced the majority of cockle fishing stop and although there was size cockle above 20 per m² on Flookburgh and many of the other open cockle beds in Morecambe Bay, these were not fished. Therefore a much smaller area than this will be fished as it will only be the areas where there is a greater density of cockle that will be fished.

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 a common species on the shore line but are often found in the upper reaches of the intertidal area, generally in muddy areas, 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

<u>Newbiggin</u>

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

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.

Due to the specific concerns raised by Natural England due to the low WeBS count data for Morecambe Bay, a more detailed assessment specific to the following species has been completed.

- Pink footed goose
- Knot
- Herring Gull
- Bar tailed godwit

• Grey plover

6.2.1 Potential Impacts

i) <u>Removal of target species (cockles)</u> 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) <u>Removal of non-target</u> 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) <u>Visual disturbance</u> - 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.

i) <u>Removal of target species (cockles)</u> 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 amount of cockle that will be left on closed cockle beds and the areas of unfished and therefore undisturbed 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. Due to the timing of the surveys in May rather than July it is likely that there has been an increase in the less than 5mm cockle on the bed. Reports from IFCOs and industry that a number of beds around Morecambe Bay have had a spat settlement including Flookburgh, Leven and Pilling. The 2021 settlement will provide food source for knot as it is within the size range they require. 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 are 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. As in 2020 this year there has seen a significant increase in the amount of size mussel within Morecambe Bay, some of which has reached greater than 60mm in shell length. There has been a mass settlement on many of the beds around Morecambe Bay including Perch and Black Scar, Heysham, South America, Falklands and area in Walney Channel, while Foulney and some of the Fleetwood mussel beds has held size mussel from over-wintering stock. Wyre End skear holds new recruits and some stock of 2020 mussel. Hard Acre in the Duddon Estuary also contain a mixture of mussel stock.

A summary of the surveys and inspections carried out along with industry reports is provided in Table 3, showing the coverage and density of mussel.



Location of the historic mussel beds in Morecambe Bay

Table 3 – Summary of Dutch Wand surveys, industry reports and NWIFCA inspections in Morecambe Bay and Fleetwood

Date	Location	Skear	Survey	Tide	Description
			Method	Height (m)	
02/03/21	North Morecambe Bay	South America	Inspection	0.8	The area had received a dense 2021 mussel settlement which was present on stoney substrate, shell debris, dead <i>Sabellaria alveolata</i> and live 2020 mussel, the new settlement was approximately 2- 3mm in size (figures 5 and 6). The settlement is earlier than what has been witnessed in recent years.
26/04/21	Fleetwood	Rossall skear	Heliflight	0.7	Plenty of starfish spread out over the scar. Sparse mussel/ cobble with no significant patches of mussel.
26/04/21	Fleetwood	Neckings	Heliflight	0.7	Plenty of starfish spread out over the scar. Sparse mussel/ cobble with no significant patches of mussel.
26/04/21	Fleetwood	Kings Scar	Heliflight	0.7	Plenty of starfish spread out over the scar. Sparse mussel/ cobble with no significant patches of mussel.
26/04/21	Fleetwood	Perch Scar	Heliflight	0.7	Sparse patches of old size mussel. Nothing significantly new yet.
26/04/21	Knott End	Wyre End	Heliflight	0.7	From distance it appeared to have small patches of mussel around the edge with cobble covering most of the scar.
26/04/21	Heysham	Heysham Flat	Heliflight	0.7	Unable to inspect closely due to the Heysham exclusion zone. Furthest skear looked to be the darkest in colour with mussel and Sabellaria around the edges. The next skear in had large patch of <i>Sabellaria alveolata</i> reef with what looked like areas of cobble. <i>Sabellaria alveolata</i> can be seen to spread widely over the main skear. Outer skears were sparse and cobbled in the centre.
26/04/21	North Morecambe Bay	Low Bottom	Heliflight	0.7	Remnants of last year's size mussel but very patchy and sparse in distribution. Cobble and sand.
26/04/21	North Morecambe Bay	Falklands	Heliflight	0.7	Covered in a large area of Sabellaria <i>alveolata</i> at the moment. Newer mussel growing on top.
29/04/21	North Morecambe Bay	Foulney	Dutch Wand	0.6	6332 tonnes of size mussel and 1919 tonnes of undersize mussel over 56.8 hectares. There was no separation made between the main Foulney bed and Foulney Island as the mussel had spread between the two and the channel had filled in. the size class is varied across the bed, with the size mussel >45 mm predominantly on Foulney Island and an area of 25- 45mm mussels in the middle section of the main skear. Evidence of multiple 2021 settlements in some areas.
30/04/21	North Morecambe Bay	Walney Channel	Dutch Wand	0.8	2671 tonnes of size mussel and 410 tonnes of undersize mussel over 18.67 hectares. The most abundant size class towards the channel edge is greater than 45 mm. Across a large proportion of the bed, there is a mix of three size classes 10-<25mm, 25- <45, and 45 <mm. bank="" cobble="" developed<br="" had="" that="" the="">along the channel edge, and noted in previous surveys, is still prominent and it is hypothesised that this could offer some protection against scour. Similar to the previous year's survey, the mussel along the channel edge was noted as present in banks of mussel with bare cobble in between.</mm.>

25/05/21	Knott End	Wyre End	Inspection	0.9	There has been a dense 2021 settlement of spat across approximately two thirds of the main skear, with the northern edge of the bed having received no settlement. Small areas of raised cobble were observed which were either bare or with low spat settlement as indicated in figure 1. Along the eastern edge of the skear the 2021 mussel settlement was mixed with small areas of 15-40mm mussel.
26/05/21	Heysham	Heysham Flat	Inspection	0.7	There was evidence of a 2021 mussel settlement which was constant across the bed on most of the exposed skear. The mussel had a dense coverage of 70-80% at a size of 8-10mm. Extensive Sabellaria alveolata reef and on the edges of the Sabellaria alveolata there was evidence the mussel had settled on it, however the majority did not appear black in colouration and therefore it was assumed that seed has not settled on it. There were also some small patches of 20-30mm mussel mixed in with the settlement.
28/05/21	Fleetwood	Rossall skear	Inspection	0.7	Rossall Scar has had a 2021 mussel settlement of approximately 40-50% coverage. The mussel was 5- 10mm and was mixed in with some 25-35mm 2020 mussel. Some live <i>Sabellaria alveolata</i> was present and covered in seed.
28/05/21	Fleetwood	Neckings	Inspection	0.7	There was mussel (35-50mm) which had persisted through the winter on the scar with the majority being size. Some area had received a 2021 settlement but it was inconsistent with a dense band of 2021 seed. The full extent was not mapped due to the order the scars were inspected. There was <i>Saccharina sp.</i> present on some of the hard substrate.
28/05/21	Fleetwood	Kings Scar	Inspection	0.7	Kings Scar has had a 2021 mussel settlement which varies across the skear in density, with some dense areas. Along the South Eastern edge the mussel seed was mixed with green algae. There was a strip of bare cobble running across the middle of the mussel bed which had not received a settlement of mussel. There were some small areas of <i>Sabellaria alveolata</i> on the northern edge of the mussel.
28/05/21	Fleetwood	Perch Scar	Inspection	0.7	Perch Scar has had a dense 2021 mussel settlement of approximately 90% coverage on the main area. The settlement was less dense on the bed edges. The mussel was 8-10mm. There were occasional small areas of 30-45mm mussel mixed in with the seed and size mussel along the channel edge. Evidence of mussel mud from 2020 and there were a number of Oystercatchers present on the scar.
28/05/21	Fleetwood	Black Scar	Inspection	0.7	Black Scar has had a dense 2021 mussel settlement of approximately 80-90% coverage. The mussel was 2- 4mm and had settled on the hard substrate. There were small areas of 2020 size mussel mixed in and on the channel edge.
25/06/21	North Morecambe Bay	South America	Inspection	1.1	Only the northern end of the bed was inspected due to access issues and timings. The mussel at this end appeared to be washing out in comparison to the previous visit, with larger patches of sand. The

					majority of mussel present at this end was 15-20mm in size and sitting loosely on top of sand.
26/06/21	Heysham	Heysham Flat	Inspection	1.1	Due to an extensive settlement of mussel seed which is putting down mussel mud, the coverage of <i>Sabellaria alveolata</i> visible has drastically reduced since the previous inspection. It is now confined to the Northern and Southern edges of the main skear. There was evidence of a 2021 mussel settlement which was constant across the majority of the main skear. The mussel had a dense coverage of 70-100% at a size of 10-20mm, with some smaller mussel of 8-10mm closer to shore (Figures 3 and 5). On the edges of the <i>Sabellaria alveolata</i> there was evidence the mussel had settled on it (Figure 4). There were also patches of 20-30mm mussel mixed in with the settlement.
27/06/21	Duddon Estuary	Hard Acre	Inspection	1	The mussel had grown significantly since the previous inspection with at least a third of the area containing 35-45mm mussel. Along the northern edge of the bed, there was a dense covering of 15-20mm mussel amongst less dense 20-40mm mussel. Some areas of the mussel were covered in a thin layer of sand and there were large numbers of sand mason between the mussel.

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, there is some uncertainly that there is enough cockle left on the closed cockle beds with high densities at varying size ranges as additional feeding to the mussel beds. Therefore NWIFCA cannot be confident that the removal of target species will have no risk of adverse effect on the SPA without further management and mitigation.

To ensure that there is a greater source of cockle as a prey source for the SPA features one of the two proposed areas should remain closed as alternative feeding. When considering the two areas as a food prey source Newbiggin has a greater densities of cockle in each of the size categories NWIFCA uses to assess cockle beds and when considering from a commercial fishery, Pilling a high density of size cockle over a small area which is better in terms of potential impacts. This will leave an additional 1600-1700 tonnes of size cockle and 200-300 of undersize cockle available.

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 with the additional management and mitigation (Newbiggin remaining closed), 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) <u>Visual disturbance</u> - All SPA species within vicinity of fishery, on the saltmarsh access route and over the sandbanks

The fishery at Pilling will be prosecuted throughout the late summer, autumn, winter and possibly early spring months (13th September 2021 to 30th April 2022). Morecambe Bay is a vital over-wintering area for waders including cockle predating species such as oystercatcher and knot. 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. There are also large areas of the Bay that hold cockle and mussel of varying size ranges which will either not be open to fishing or will not be targeted by gatherers due to the lack of size cockle. These will provide alternative area for birds to remain undisturbed.

The number of byelaw 3 permit holders fishing at Pilling is anticipated to be low after an initial peak. At Pilling the bed is relatively large and fishers are likely to be working in small groups in the middle to low reaches of the bed straight in front of the access route at Fluke Hall Lane 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).

Further information on the species highlighted within Natural England formal advice has been provided below on species which have an observed reduction in WeBS count data across Morecambe Bay.

Bar-tailed godwit: The Lune Estuary is known to be a key for bar-tailed godwit on passage as well as the overwintering population with at time the majority of the individual present within Morecambe Bay being within the Lune estuary. Pilling Sands is located within the Lune Estuary and therefore there is the potential for disturbance. Main locations for roosting are noted as Conder Estuary Marsh, Glasson Marsh and Middleton, other important locations include West Plain, Potts Corner, Ocean Edge, Plover Scar and locations on Walney Island. The roost sites are away from the main access point onto Pilling sands and the fishery will take place three hours either side of low water which will further reduce disturbance. There is potential for the birds to be present on Pilling Sands while feeding but there is no indication that the species would favour Pilling sands over anywhere else on the Lune estuary. Bar-tailed godwit are known to feed on molluscs including Limecola balthica, cockle and Hydrobia spp. NWIFCA carry out a number of surveys on the cockle beds and the following observations are concluded: Hydrobia spp. are a common species on the shore line but are often found in the upper reaches of the intertidal area, generally in muddy areas, and therefore away from the majority of the fishing activity; other bivalve species can be mixed in with cockles, but do not favour the same sediment and can be found across the bed. The juvenile cockle observed by IFCOs is witnessed across the bed and not just where the size cockle is present. Further to the above the size cockle on Pilling is 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 450 hectares of a total of 1434 hectares of cockle bed, which equates to 31% of Pilling Sands cockle bed. Knowledge from previous fisheries is that fishing will stop before the cockle density reaches 20 per m² further reducing the area that will be fished. The number of cockle bed opened to fishing is significantly lower than the last 5 years when a large proportion of Morecambe Bay cockle beds have been open.

Grey Plover: Main roost site include Walney and Middleton, Fluke Hall provides a refuge roost on high spring tides when other sites are inundated. Fluke Hall is close to the main access point to the fishery but the fishery operates three hours either side of low water, therefore very unlikely to disturb a roost at high water that occurs on large spring tides. There is potential for the birds to be present on Pilling Sands while feeding but there is no indication that the species would favour Pilling sands over anywhere else in Morecambe Bay. Pilling sands is a large area with the fishing located in the middle of the beach out from the main access point. Size cockle on Pilling is 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 450 hectares of a total of 1434 hectares of cockle bed, which equates to 31% of Pilling Sands cockle bed.

Herring gull (Breeding): Herring gulls breed within Morecambe bay between May and July at colonies on Walney and Hodbarrow. Fishery is outwith of the breeding season and away for the breeding colonies.

Herring gull (as part of the waterbird assemblage): Herring gulls will be found within the site but there is no evidence they would favour Pilling sands over any of the other cockle beds or intertidal sand flats. Herring gulls are more likely to favour mussel beds within the site.

Knot: Roost sites within Morecambe bay include Middleton, East Plain, and the Stone Jetty and Heysham heliport as well as other location in North Morecambe Bay. There is not going to interact with any of the main roost sites. Knot are known to feed on sand banks, mussel beds on salt marsh. There is potential for the birds to be present on Pilling Sands while feeding but there is no indication that the species would favour Pilling sands over anywhere else in Morecambe Bay. Knot are known to feed on molluscs including cockle and mussel as well as Hydrobia spp. Hydrobia spp. are a common species on the shore line but are often found in the upper reaches of the intertidal area, generally in muddy areas, and therefore away from the majority of the fishing activity. The juvenile cockle observed by IFCOs is witnessed across the bed and not just where the size cockle is present. Further to the above the size cockle on Pilling is 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 450 hectares of a total of 1434 hectares of cockle bed, which equates to 31% of Pilling Sands cockle bed. Knowledge from previous fisheries it that fishing will stop before the cockle density reaches 20 per m² further reducing the area that will be fished. As highlighted above in section 6.2.2(i) there is significant food resource and therefore undisturbed cockle and mussel beds across Morecambe Bay.

Pink-footed goose: the Wyre Estuary is where the main concentration of the species is, particularly around Pilling. It is known that Pink-footed geese will roost on Pilling particularly on the fringes of the saltmarsh and the upper shore. There is potential for disturbance of roost in the hours of darkness though the winter while the fishery is open. The main access route for the fishery is at the Western edge of the Saltmarsh. The main extent of the saltmarsh and where officers have witnessed the roast of Pink-footed geese in the area East of the access point to the mouth of the river cocker. This is away from the main area of fishing, as shown above in section 3 the main area of dense cockle is located in the mid shore directly out from the access route, this is where the majority of the activity is predicted. Travel to and from the fishery is likely to be limited to one trip each way at the start and end of fishing which will further limit the chances of disturbance. Permit holder tend to prefer the low water which is in daylight compared to working in darkness further reducing the potential of disturbance of the roost. There is likely to be no interaction with the species when they are not roosting as they will be feeding in nearby fields.

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 close the bed.

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 on Pilling Sands and this will also be checked and enforced);
- b) Rigorous enforcement of the MLS;
- c) Closure of all other cockle beds under a NWSFC Byelaw 13a closure;
- d) 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);
- e) Monitoring and inspection to ensure no damage to the saltmarsh and that there are no litter issues;
- NWIFCA enforcement officers will use intelligence and contacts with fellow enforcement agencies to pursue any suspicions of non-permitted or illegal cockling activity;
- g) Use of the NWIFCA Compliance and Enforcement Strategy which defines how the NWIFCA will enforce local, national and international law. (<u>https://www.nw-ifca.gov.uk/compliance-enforcement-strategy/</u>)

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/Su b 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	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
Coarse sediment (Estuaries, Mudflats and sandflats not covered by seawater at low tide, Large shallow inlets and bays. SPA		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
supporting habitats)		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 	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	Newbiggin cockle bed will remain closed to ensure there are enough alternative food resource other than mussels, at a range of size classes and in enough density for bivalve eating bird species to use as a prey source.
features that feed on infaunal molluscs		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 additional management as described as well as current management, 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	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

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	Sterna hirundo			
Common tern	Common tern			
Sterna albitrons	Sterna albifrons			
Little tern	Little tern			

7. Conclusion

The proposal is to open Pilling Sands and Newbiggin, Morecambe Bay, to removal of size cockles to hand-gathering; on 13th September 2021 until the start of the 2022 closed season on 1st May 2022 unless closed by NWIFCA prior to this date for management reasons. After assessment of the proposal there is potential that opening both fisheries has the potential to effect the integrity of the site due to a lack of food resource for the bivalve eating SPA bird features. Therefore additional management and mitigation measures have to be implemented and Newbiggin will remain closed as an alternative cockle food source.

With the additional management and mitigation as well as the current management measures incorporated into this fishery, and the use of an effective enforcement team of NWIFCA Officers with multi-agency support, NWIFCA can conclude that the hand-gathered cockle fishery at Pilling Sands will have no risk of adverse effect to the integrity of the European Site to be reached.

8. In-combination assessment

There is potential for a number of seed mussel fisheries at various locations around Morecambe Bay. Seed mussel fisheries are only authorised if the mussel is assessed as being ephemeral. Certain conditions need to occur for the NWIFCA to authorise fishing of seed mussel, namely that the stock has been assessed as in imminent likelihood of being lost to the fishery through natural causes, and subsequently that a high proportion of it will not grow through to reach size; and that conditions pertain to fishing being possible without risk of damage to the cobble and boulder substrate conservation features. These include:

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

It is still too early to make this assessment and therefore the potential seed mussel fisheries have not be including in the in-combination assessment. Should any seed mussel fishery be likely, NWIFCA will carry out a HRA to consider the potential impacts and will include the Pilling cockle fishery in the in-combination assessment.

a) Other ongoing and authorised fisheries:

Size mussel fisheries – there is a low level of activity on the size mussel fishery on Foulney. Typically, effort on these fisheries is around ten gatherers per tide fished on spring tides.

b) Assessment

Due to the low levels of mussel hand-gathering the impacts on habitats and disturbance levels to birds are considered to have No Likely Significant Effect on the conservation features. Removal of the size 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.*

Considering in combination effects of the mussel 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 cockle fishery in Morecambe Bay 2020-21.

Annex A – Newbiggin Cockle Fishery Area



Date: 06 September 2021 Our ref: 359004 Your ref: Morecambe Bay Cockle Fishery HRA

NWIFCA Preston Street Carnforth Lancs LA5 9BY

VIA WEBSITE ONLY

NATURAL ENGLAND

Natural England (Lake District National Park Office) Murley Moss, Oxenholme Rd Kendal Cumbria LA9 7RL T 0300 060 3900

Dear Jon Haines

Morecambe Bay Cockle Fishery HRA Thank you for your consultation dated 05 July 2021 The following constitutes Natural England's formal statutory response.

The Conservation of Habitats and Species Regulations 2017 (as amended) and The Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended)

We can confirm that the proposed works are located within Morecambe Bay SAC, Morecambe Bay & Duddon Estuary SPA and Morecambe Bay Ramsar.

Assessment of likely significant effect

Natural England's advice is that this proposed development may contain (or require) measures intended to avoid or reduce the likely harmful effects on a European Site, which cannot be taken into account when determining whether or not a plan or project is likely to have a significant effect on a site and requires an appropriate assessment (noting the recent People Over Wind Ruling by the Court of Justice of the European Union).

For this reason, we advise that on the basis of the information supplied that the application may have a likely significant effect on these sites. The application requires an appropriate assessment in accordance with the Conservation of Habitats & Species Regulations 2017 (as amended).

Appropriate assessment

We note 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 63 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, with mitigation measures, will not result in adverse effects on the integrity of any of the sites in question.

Analysis of recent cockle fisheries in Morecambe Bay

Natural England has also considered further information you provided relating to historic landings from

previous years of cockle fisheries in Morecambe Bay and makes the following additional notes, based on these:

- NE agrees that the main concern is bird food resource. Specifically, availability of cockles for knot and oystercatcher, that may use them as a significant source of food.
 - The mitigation measure of only opening one of the proposed beds, Pilling, has been suggested by the NWIFCA as a way of ensuring sufficient cockle remains, following a fishery, as a bird food resource.
- For previous years fisheries, an estimate of remaining biomass available for birds to consume can be made by subtracting landings from the total biomass estimates. A similar calculation can made for 2021 based on 50% of size cockle from Pilling being fished, in order to provide a comparison between the years:
 - In 2021, opening the fishery for Pilling would result in 16% less total cockle remaining within Morecambe Bay, based on 50% of size cockle being landed.
 - In both cases, the overall estimated quantity, in tonnes, of cockle biomass remaining within Morecambe Bay as a whole in 2021 is higher than in 2016, but lower than in the subsequent years fisheries.
 - The landings reported for previous years are considerably less than 50% of the size cockle in open beds and are likely an underestimate. Accounting for this, it can be reasonably assumed that the actual biomass of cockle remaining after previous years fisheries was lower and the estimate for 2021 is therefore precautionary. The amount left if Pilling is opened in 2021 would be thus comparatively higher and further toward the middle of the range of remaining biomass from previous fisheries.
 - If the calculations are made based on all available size cockle being taken from the open beds in a given year (i.e. the worst case scenario that is assessed by each HRA), then the biomass remaining in 2021 is greater than in 2016, 2017 and 2020.
 - Based on biomass estimates, the fishery is therefore within the envelope of previous HRA compliant fisheries.
- Distribution of remaining cockle in 2021 would be somewhat affected by the fishery, based on the above assumptions.
 - Under either a fishing or no fishing scenario, the distribution is quite even across the assessed beds in comparison to previous years. This is within the variation seen in previous years, where much more uneven distribution has been the case, due to natural variations in settlements.
 - Based on this assessment of effects on cockle distribution, the fishery is therefore within the envelope of previous HRA compliant fisheries.
- The composition of the remaining cockle is markedly different in 2021 to any previous year, under either scenario. Typically, undersize (juvenile) cockles have been the dominant component, whereas in 2021, size (adult) cockles dominate.
 - This could be due to earlier timing of the surveys in 2021, or due to a lack of recruitment (settlement of cockle spat).
 - Oystercatcher are capable of feeding on size cockles, whereas knot favour smaller cockles, within the undersize range. The fishery, however would have no significant impact on the availability of undersize cockle as these are not taken.
 - Therefore, based on the available information, the biomass of cockle available for oystercatchers is within the range of that left by HRA compliant fisheries in previous years.
 - The biomass of cockle remaining that knot could exploit as a food source appears to be significantly lower in 2021, whether or not there is a fishery. Rather than an impact linked to the proposed fishery, this is due to: timing of surveys not detecting early settlements, and/or; a lack of cockle spat settlements in 2021, part of the natural variation expected for cockle populations within Morecambe Bay.
 - Therefore, the availability of undersize cockle for knot is within the range of natural variation and the fishery is within the envelope of previous HRA compliant fisheries.
- As for previous years fisheries, the presence of abundant mussel within Morecambe Bay has been used as a mitigating factor in determining whether there would be an adverse effect on integrity.

- Seed mussel fisheries have been opened again this year, targeting the ephemeral undersize mussel that are unlikely to remain over winter and provide a source of food for birds. Nonetheless, there is abundant other mussel available on more established beds, as outlined in the HRA. NE concurs with this assessment.
- From 2007 to 2015 there was very little cockle at all within Morecambe Bay and no fisheries. It is not believed that this significantly affected bird populations. However, when cockle settlements do occur, a suitable level of precaution is warranted to ensure that fisheries do not alter the diversity of food types available beyond expected natural variations.
- The above discussion on biomass, distribution and composition of cockle stocks in Morecambe Bay under the conditions of a fishery being opened on Pilling sands indicates that this would not be the case as the impacts would be relatively small and within the range of natural variation, including an appropriate level of precaution applied to the effects of fishing on the cockle population.

Recent bird data

The HRA document sets out well the fishery aspects of the proposal, however, NE is concerned that it does not review the proposal in the context of the latest Wetland Bird Survey (WeBS) birds data. While the site supplementary advice identifies a maintain objective for most features likely to interact with this fishery either through direct competition for food; disturbance; or indirect modification of food resources through the activities of the fishery the assessment cannot rely on this alone and should consider the latest available information.

The latest WeBS data for Morecambe Bay (covering the winter of 19/20) showed a marked decrease in the populations of many species compared to the year before such that the Assemblage total for the site has fallen by c60,000 birds (29%) on the value for the previous winter (18/19).

Based on current evidence it cannot be determined whether or not the decline is linked to fisheries within Morecambe Bay, although many of the species that have individually declined may potentially interact with shellfisheries. Some notable species of concern present in the fishery area include:

- Pink-footed goose (pilling Sands roost) decline c10,000 indiv
- Knot (feed on juvenile cockle and Macoma on Pilling sands) decline c9000 indiv
- Herring Gull (feed on bivalves) decline c6000 indiv
- Bar-tiled Godwit (main feeding ground Pilling Sands) decline c2000 indiv
- Grey Plover (main feeding ground Pilling Sands) decline c500 indiv

Although Eider have declined they are largely a feature of other areas of the Bay than the Pilling area so are low risk in the context of this specific proposal.

Of the key species of concern to this HRA only oystercatcher appears to have held its numbers, however, oystercatcher are very site loyal and will often stay put and risk being unable to secure adequate food resource with a consequent loss of fitness than move onto different sites if food resources are limited.

Natural England notes that despite the disruption to WeBS recording in winter 19/20 as a consequence of Covid measures, it is unlikely to be the reason for these low figures as (in normal years) the peak counts for the species all fall earlier in the winter period than the commencement of lockdown restrictions in March 2020.

Natural England advises that a full review of this issue should be apparent in the HRA and without this considers the HRA as it stands to be incomplete. The HRA should identify and acknowledge these declines and verify that the fishery (as practiced in recent winters) has not had a role in this. Subject to the inclusion of this review and verification that the fishery has not contributed to these declines, Natural England would be able to concur with the assessment conclusions, providing that all mitigation measures are appropriately secured in any permission given.

Marine and Coastal Access Act 2009

The proposal, as set out in the information provided, is sited within a Marine Conservation Zone (MCZ). Wyre-Lune Estuary has been designated due to the presence of:

Smelt Osmerus eperlanus

Having reviewed the evidence relating to the site we believe that the works will not hinder the conservation objectives of this site.

Wildlife and Countryside Act 1981 (as amended)

We can confirm that the proposed works are located within Lune Estuary SSSI. Natural England advises that the proposal, if undertaken in strict accordance with the details submitted, is not likely to damage the interest features for which the site has been notified.

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

Yours sincerely,

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Page 4 of 4

09-09-21: The HRA was amended by NWIFCA with the above Formal Advice taken into consideration and additional assessment made on the highlighted concerns and sent back to NE for further advice.

10-09-21: Further advice was received from Natural England via email agreeing with the assessment and that the concerns expressed had been addressed within the amendments.