ANNEX A - SURVEY REPORT NOVEMBER 2019

i. MUSSELS

a) Fleetwood: Perch and Black Scar Mussel Inspection 03-09-19

LW: 09:27 0.54m (Liverpool Tides)

At the end of August, industry contacted NWIFCA indicating an interest in fishing Perch Scar by dredge, as the mussel had put down significant mussel mud and was washing away. NWIFCA officers carried out an inspection of Perch and Black Scar on 3rd September 2019.

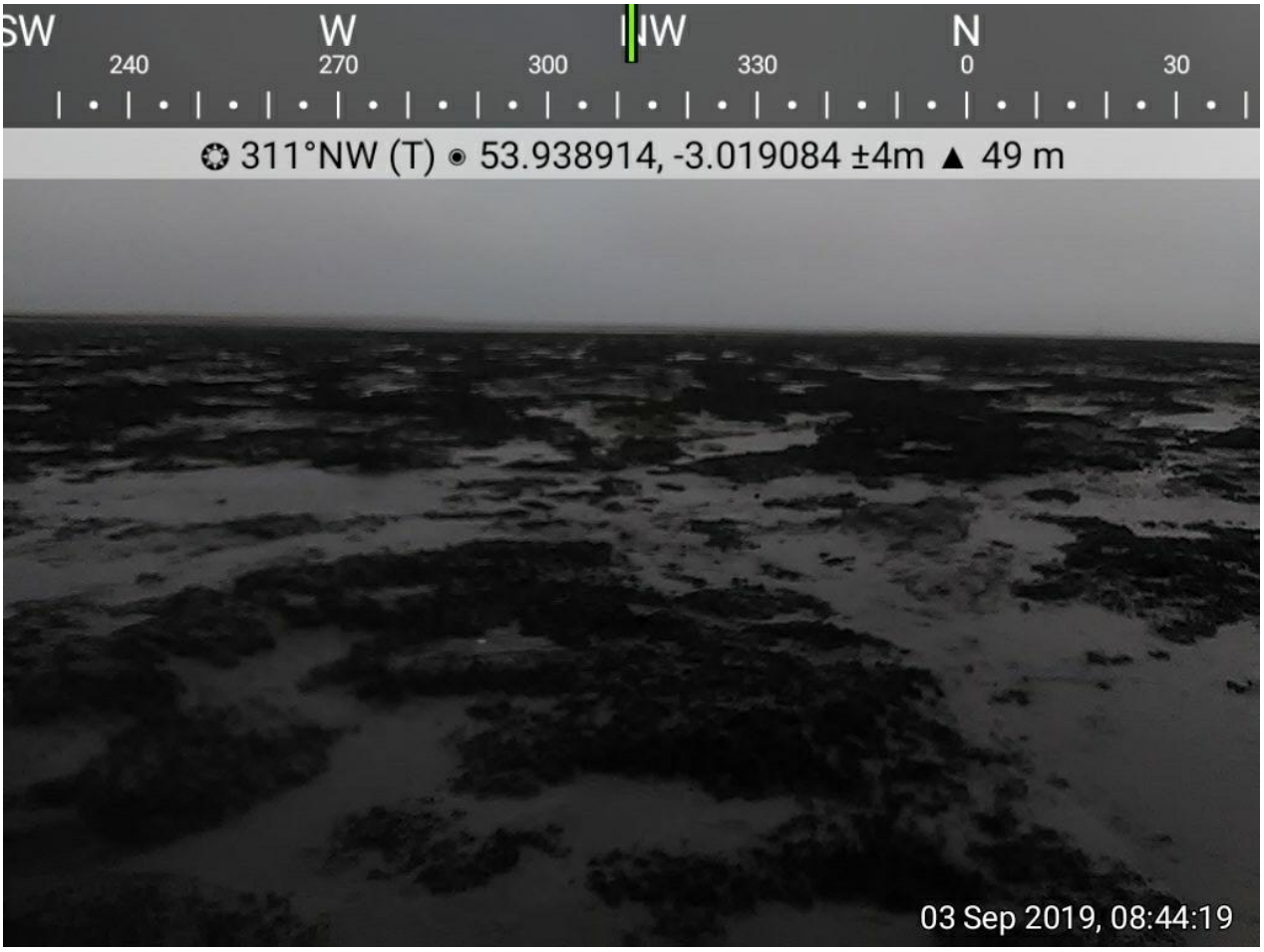
Black Scar

The area of mussel on Black Scar was 4 hectares but the mussel had not put down a significant depth of mussel, meaning there is exposed cobble skear and the area cannot be considered for dredging.

Perch Scar

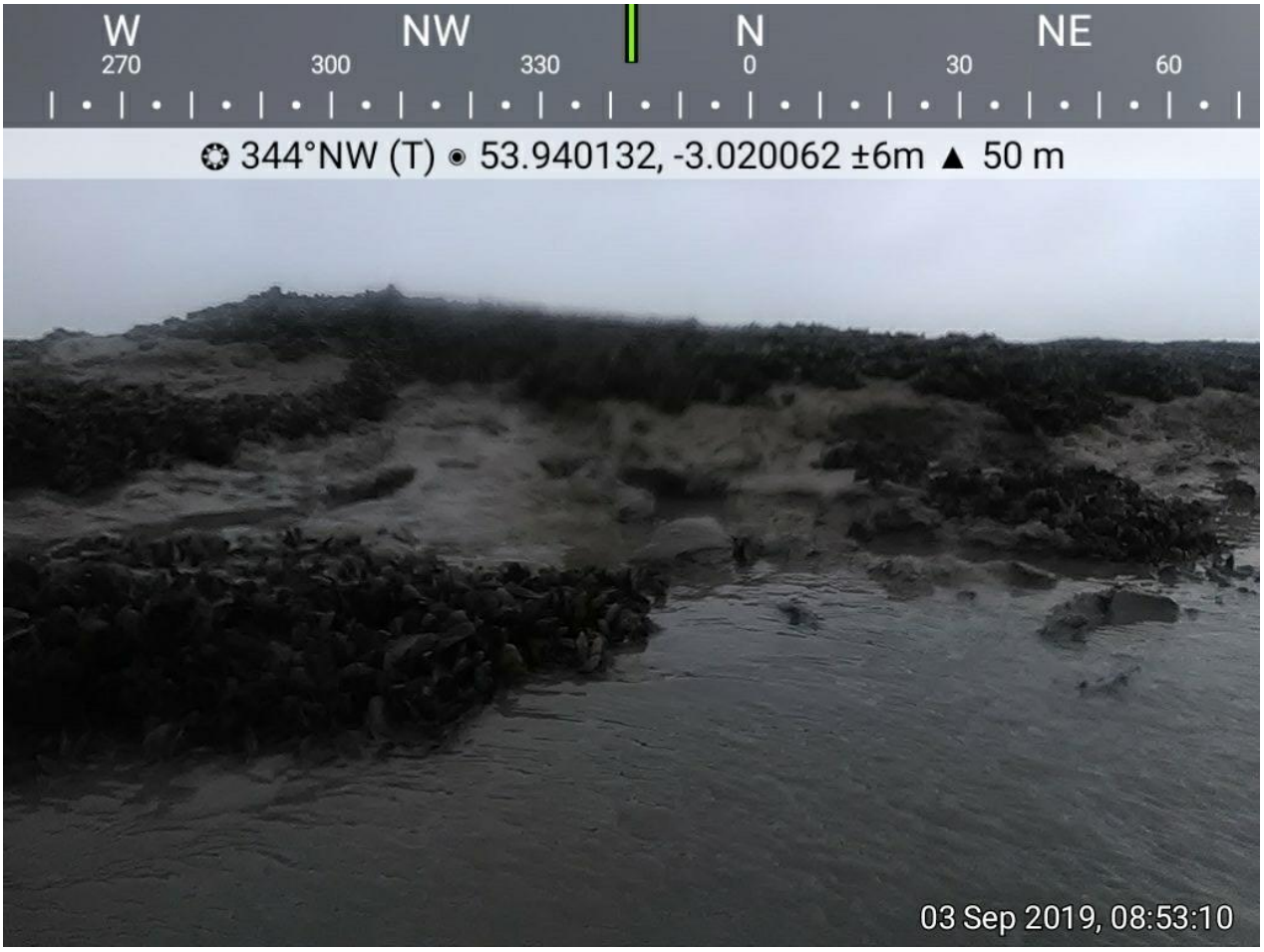
Perch Scar was 10 hectares in size and the mussel had put down a considerable depth of mussel mud, the mussel had become very loose and had started to scour out (images have been provided below). An estimated 40 to 50% of the area was bare mussel mud from which the mussel had scoured away.

Illustration of the areas holding mussel from GPS tracking - Black Scar and Perch Scar Fleetwood 03-09-19



Perch Scar - Image of Mussel, Areas of Scour and Depth of Mussel Mud September 2019

Perch Scar - Image of Mussel, Areas of Scour and Depth of Mussel Mud September 2019



Perch Scar - Image of Mussel, Areas of Scour and Depth of Mussel Mud September 2019

ii. COCKLES

For all cockle surveys:

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

Means were calculated from all stations with zero counts on the edge of the bed removed and the area to the South of the survey area with low densities of cockle. 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), density of 0-5mm size class cockle 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 - [1]size cockle defined as cockle which will not pass through a square gauge 20 x 20mm in size.
[2]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.

A) Warton Sands Cockle Survey 27-09-19

Tides: LW 17:32 1.4m (Liverpool tides)

11 survey stations were sampled from a 250m grid with an additional 7 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 and therefore the full extent of the cockle bed could not be surveyed. There will be cockle present outside of the surveyed area and in some areas at high densities. There was a muddy band running parallel with the shore that contained a significant amount of undersize cockle. The area of cockle extends further north and in higher densities than previously surveyed (6th June 2019). The cockle was very mixed in size classes across the surveyed area from less than 5mm cockle to size cockle. The density of size cockle across the bed was low with the highest densities in the area to the north. The estimated biomass should be used with caution, as areas of the bed could not be surveyed, which are likely to have cockle present and the western edge of the surveyed area had large deep channels running through it, where the cockle has most likely been washed out.

Means

Mean number of size cockle	13 per m^2	(min 0, max 100)
Mean number of undersize cockle	720 per m^2	(min 12, max 2030)
Mean number of 0-5mm cockle	22 per m^2	(min 0, max 200)

Biomass

	Area (ha)	Size Cockle (tonnes)[1]	Undersize Cockle (tonnes)
Warton Sands Dense Area	**186**	**~65**	**~3400**

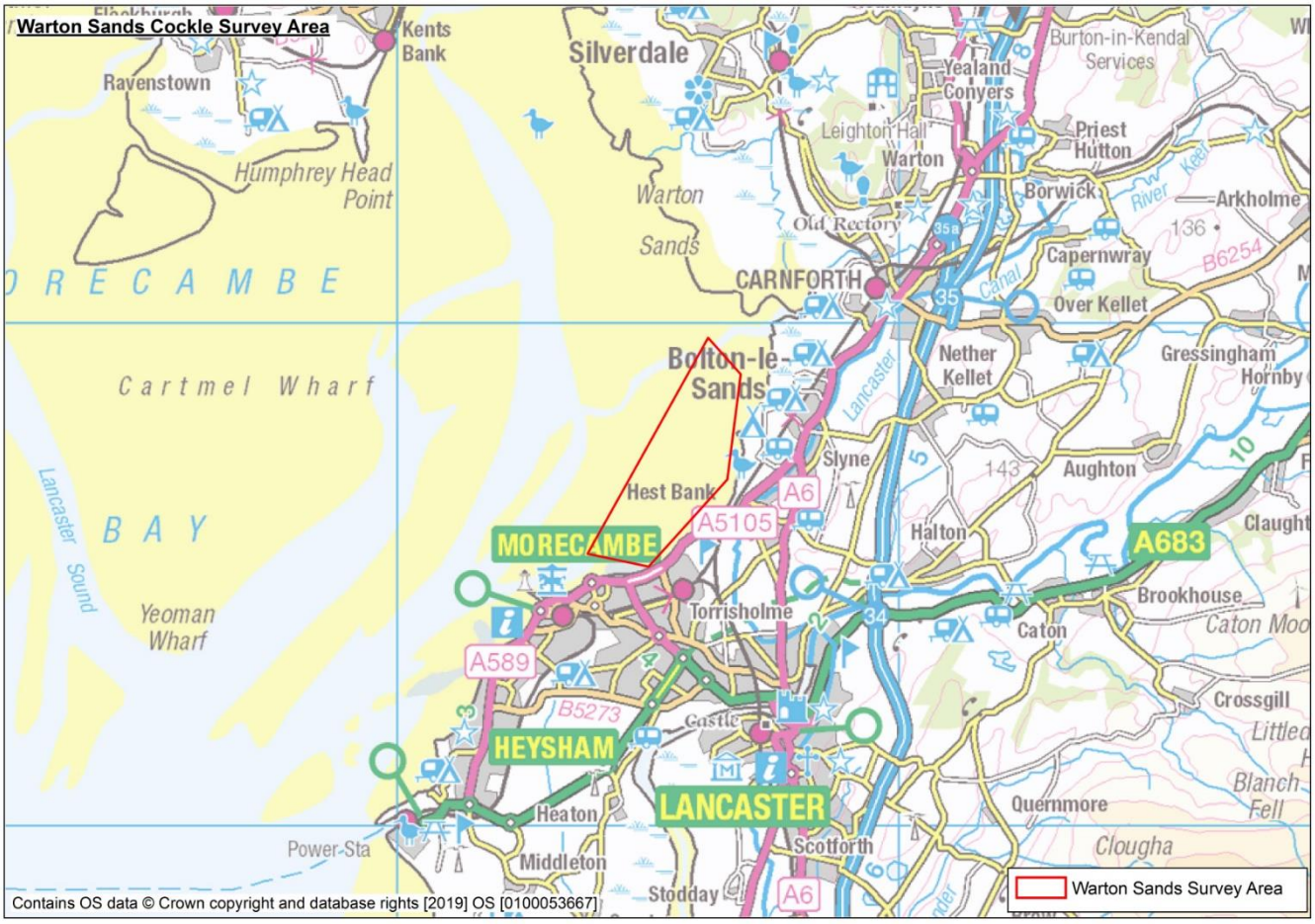
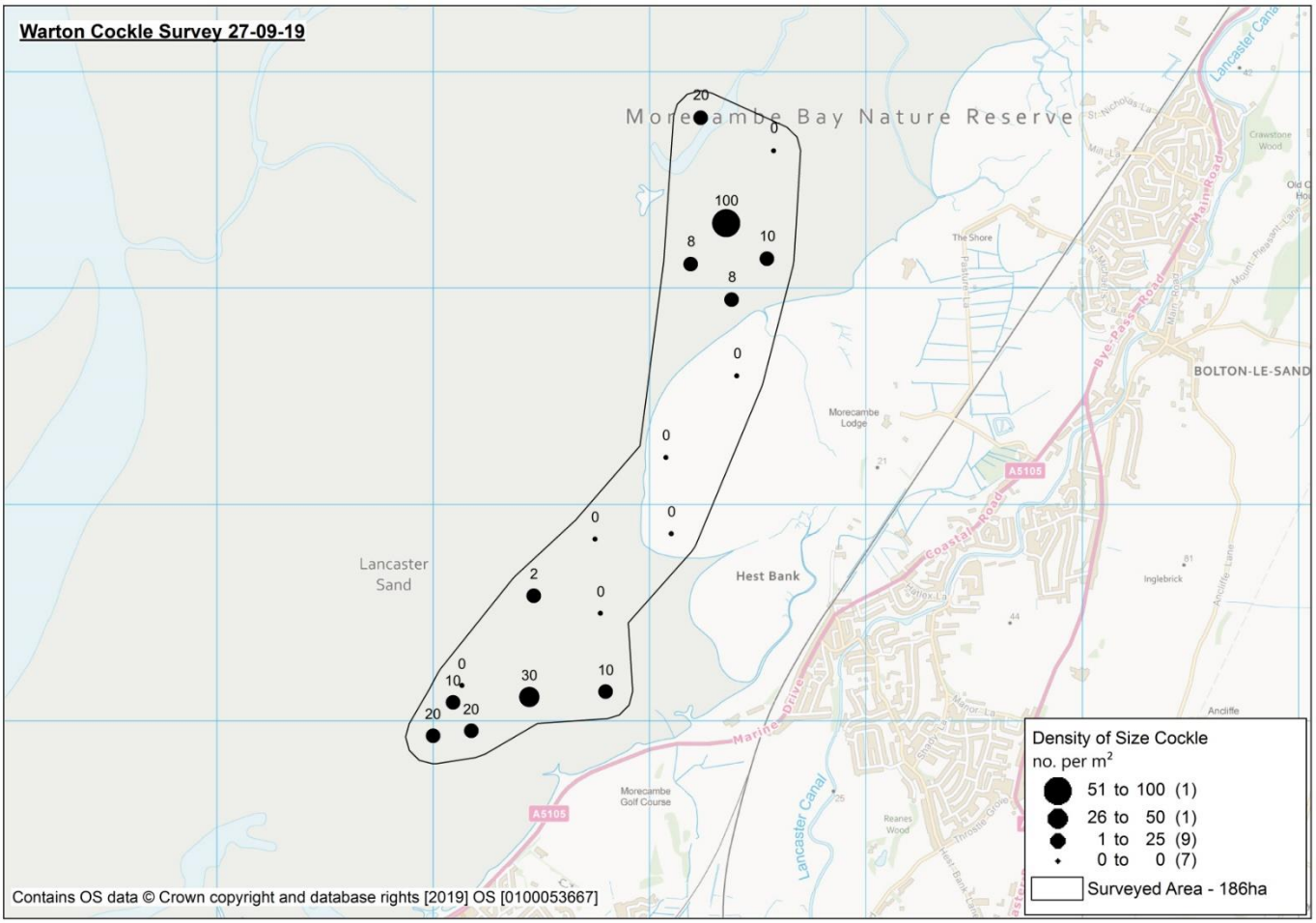
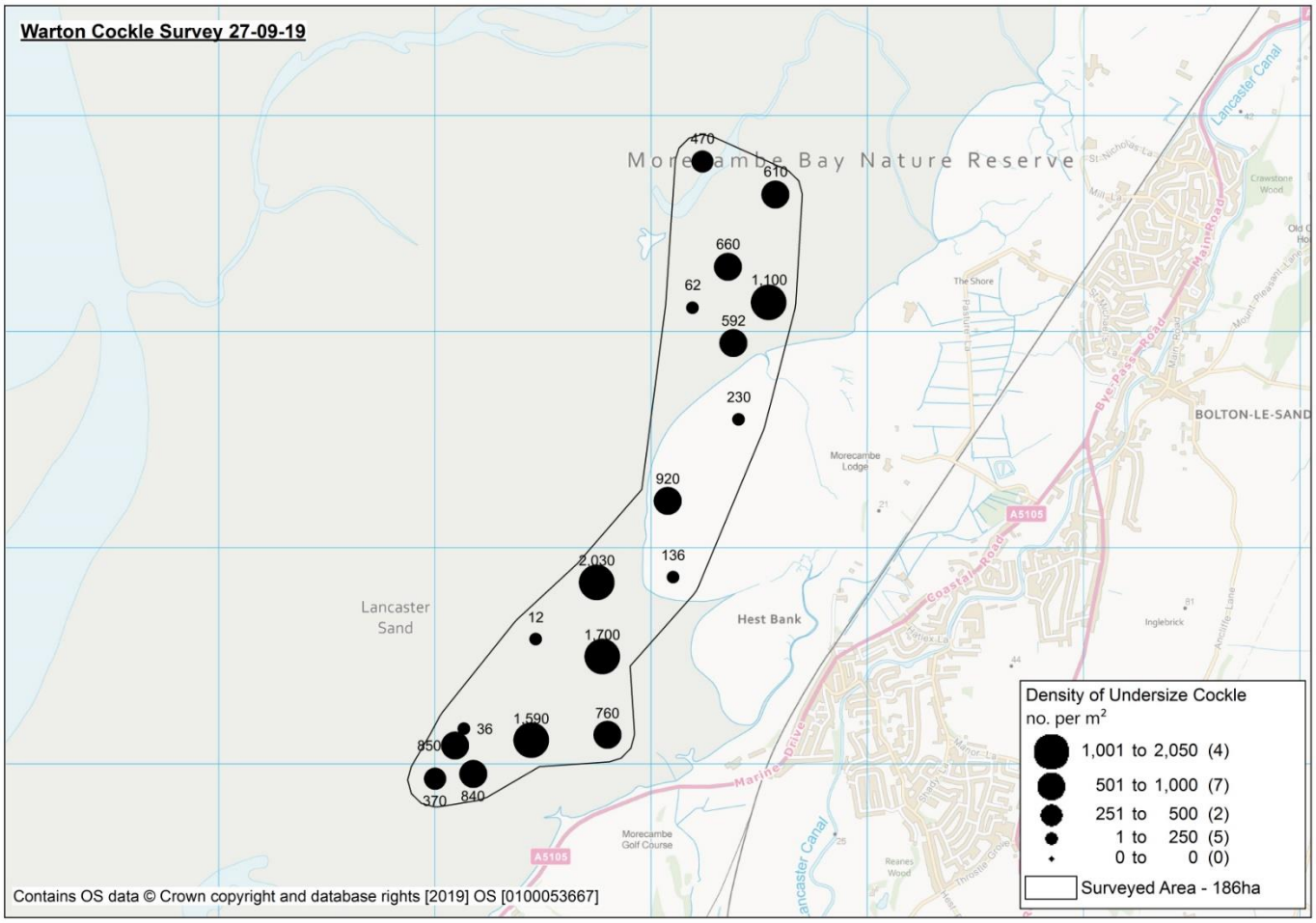


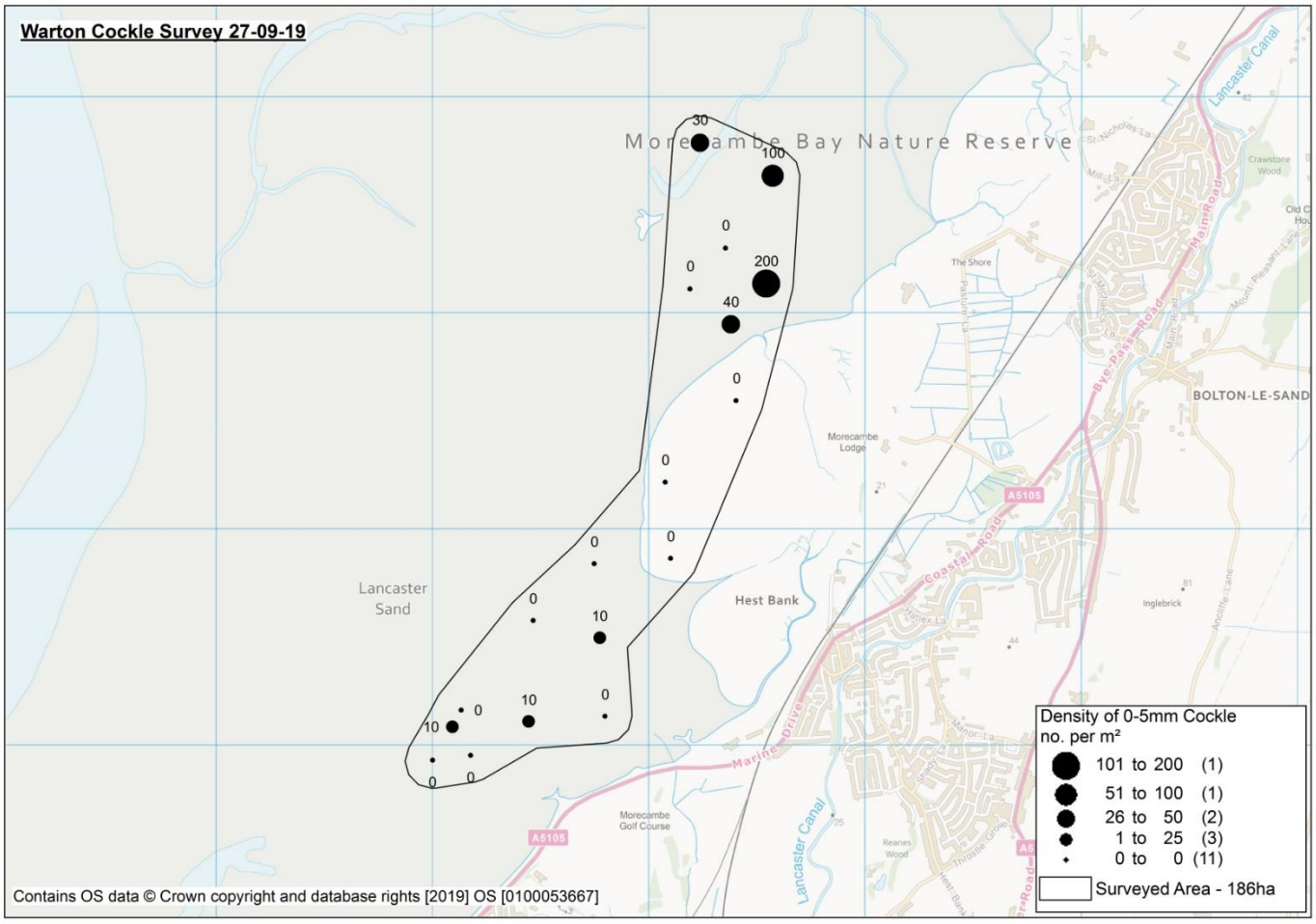
Illustration of position of Warton Sands cockle bed



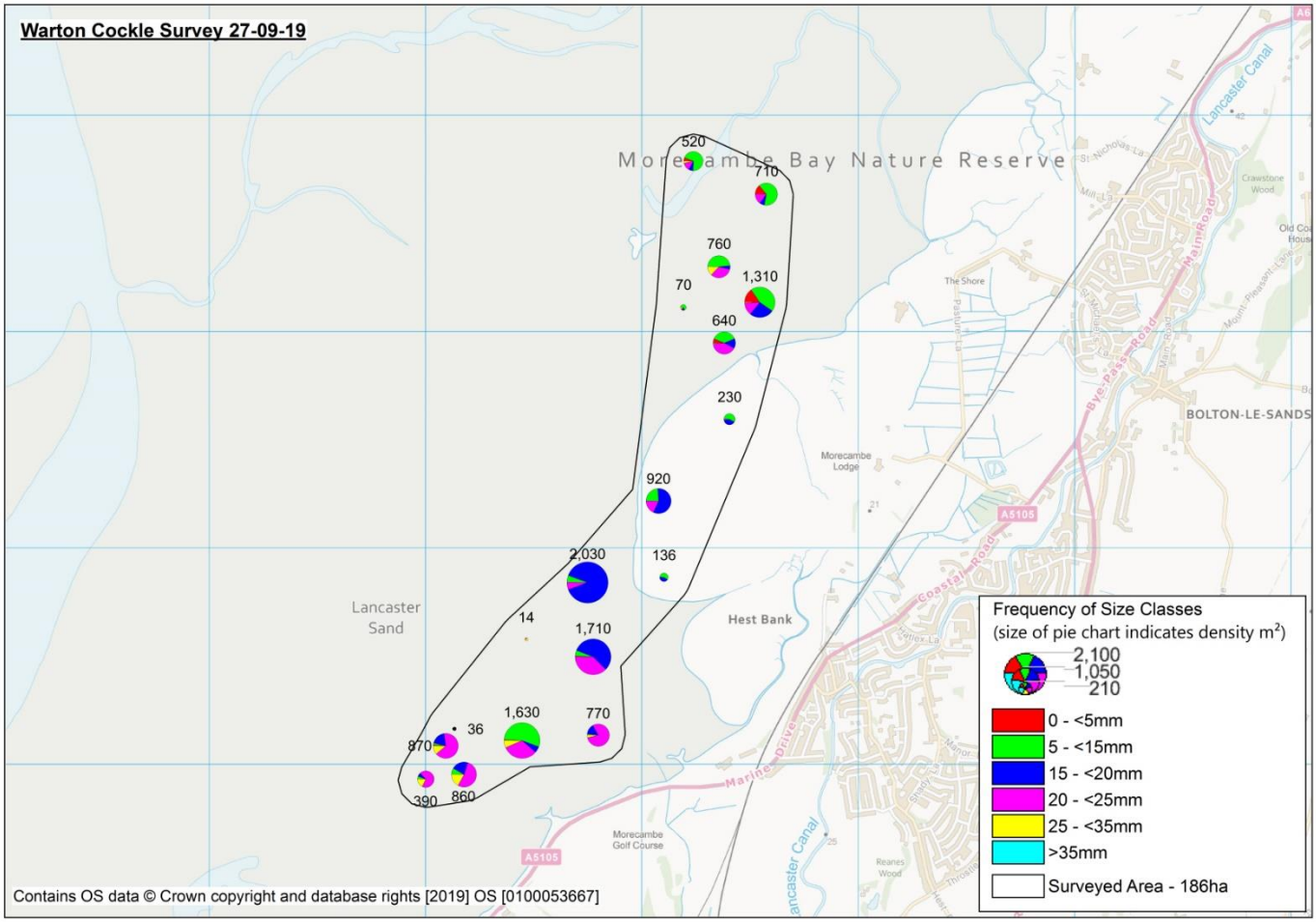
Density of size cockle per m² Warton Sands September 2019



Density of undersize cockle per m² Warton Sands September 2019



Density of 0-5mm cockle per m² Warton Sands September 2019



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

b) Pilling Sands Cockle Survey 01-10-19

Tides: LW 08:21 0.3m (Liverpool tides)

53 stations were sampled from a 500m grid. Of these, 25 locations were sampled east of the open/closed line as determined in the September 2019 fishing authorisation (see maps) and so in the open fishery area, with the remaining 28 sampling locations on the western /closed side. There was a relatively low density of size cockle across the bed with a small area of higher density size cockle to the east, which was consistent with the July 2019 survey. Most survey stations had undersize cockle present which ranged from 15 – 25mm in shell length. Cockles in the 0-5mm size range were restricted to a small area on the eastern edge of the surveyed area.

<u>East - Open</u>

Mean number of size cockle	20 per m²	(min 0, max 90)
Mean number of undersize cockle	85 per m²	(min 12, max 250)
Mean number of 0-5mm cockle	13 per m²	(min 0, max 100)

<u>West – Closed</u>

Mean number of size cockle	9 per m²	(min 0, max 68)
Mean number of undersize cockle	65 per m²	(min 0, max 356)
Mean number of 0-5mm cockle	0 per m²	

Biomass

Pilling Sands	Area (ha)	Size Cockle (tonnes)[1]	Undersize Cockle (tonnes)
East - Open	**504**	**~1150**	**~750**
West - Closed	**736**	**~730**	**~1250**

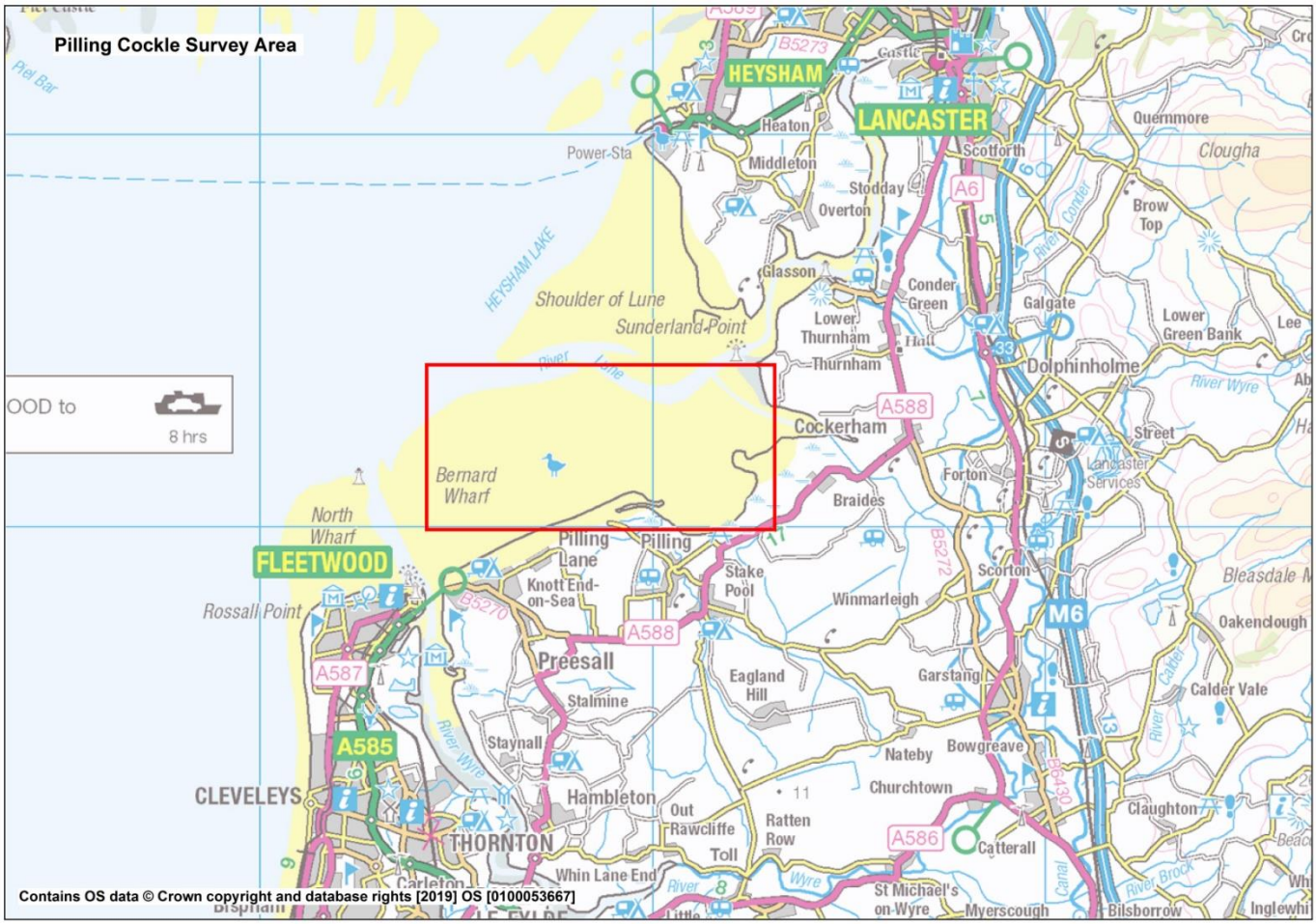
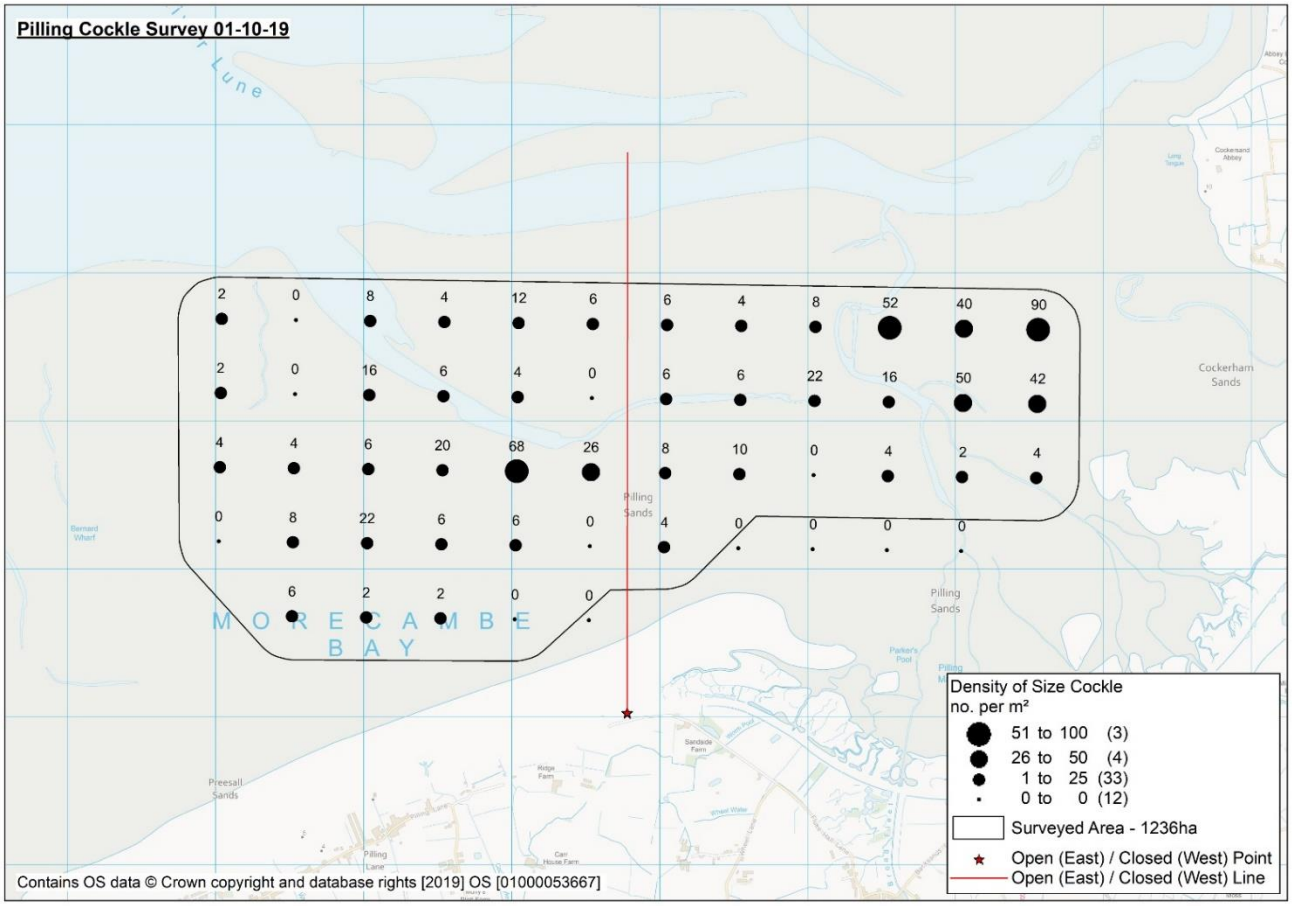
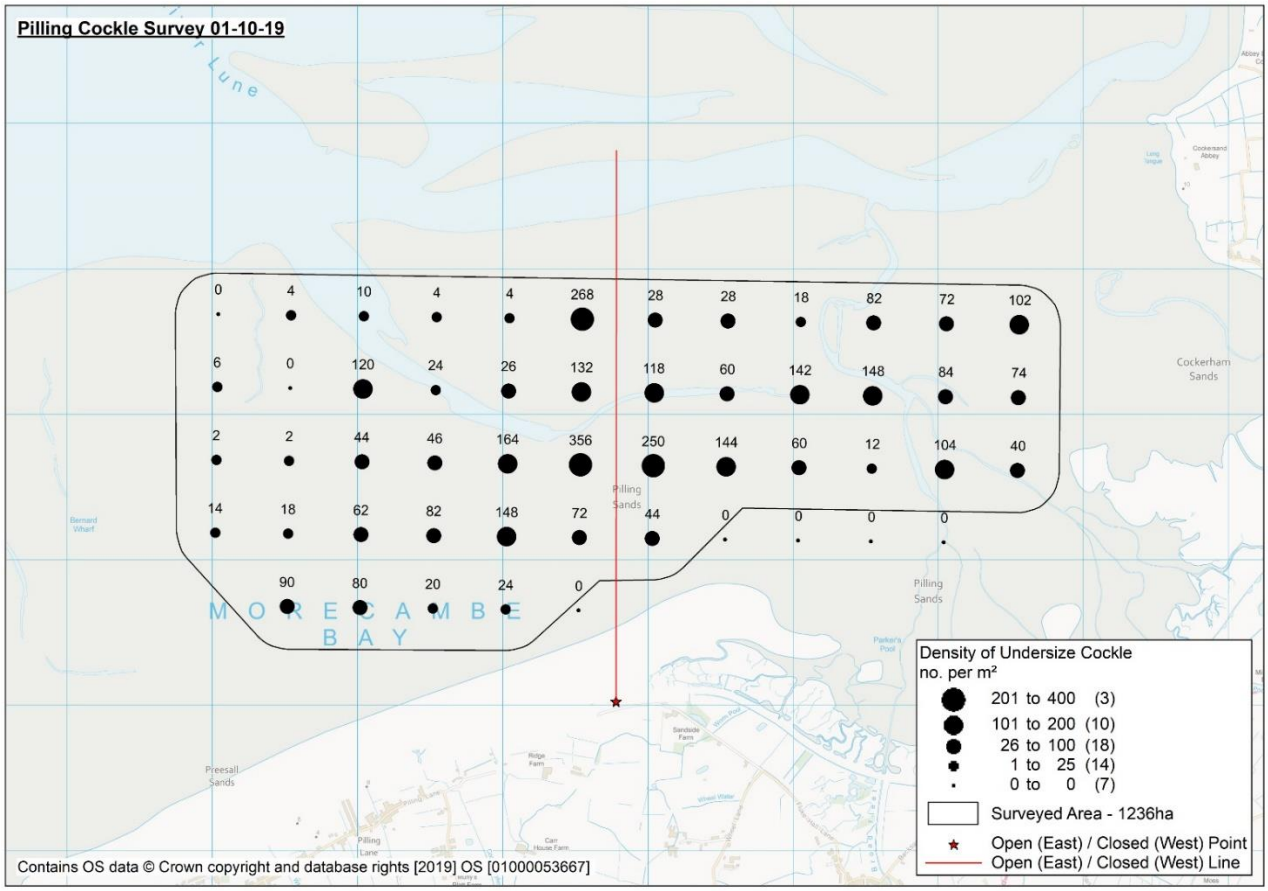


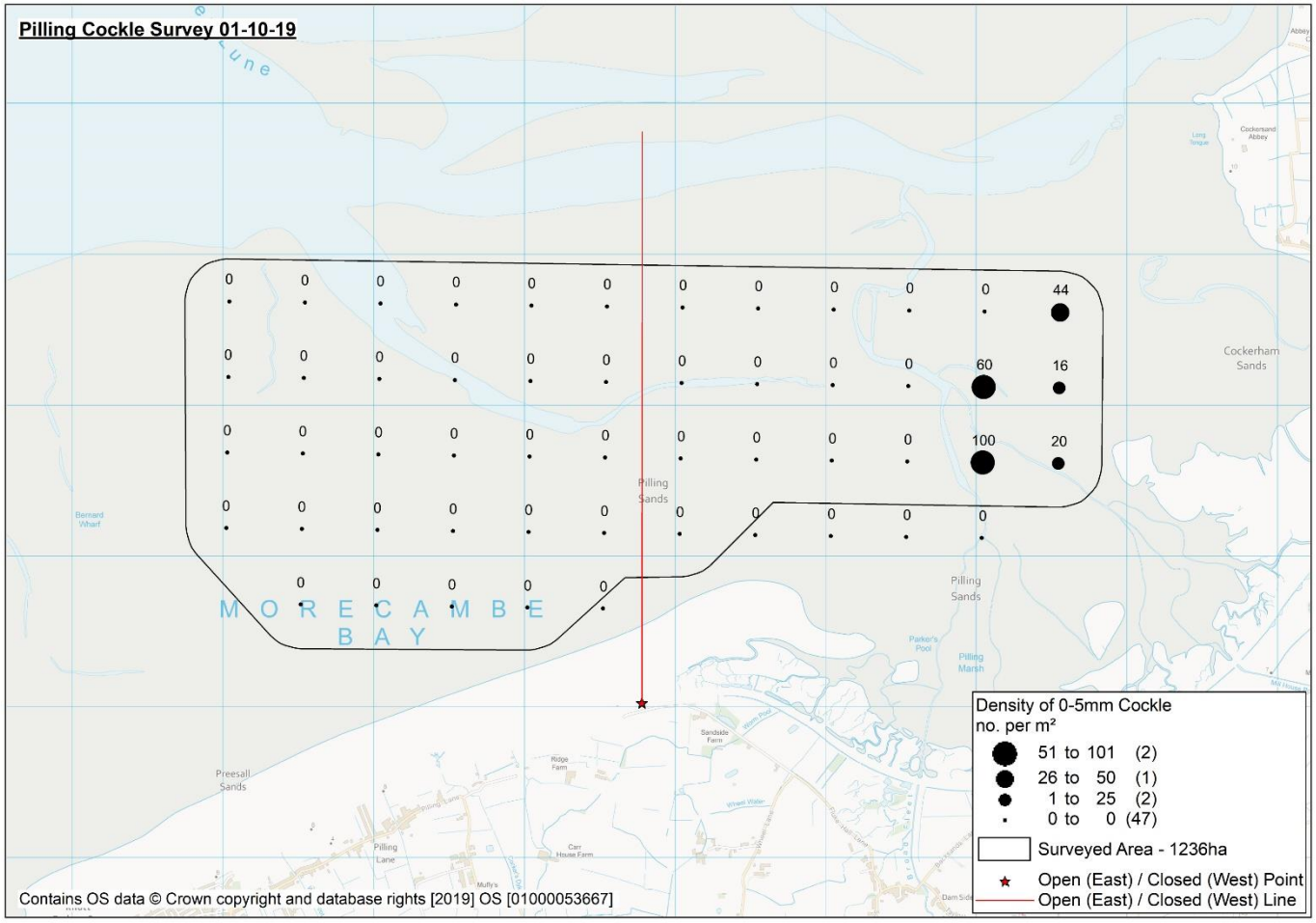
Illustration of position of Pilling Sands Survey Area



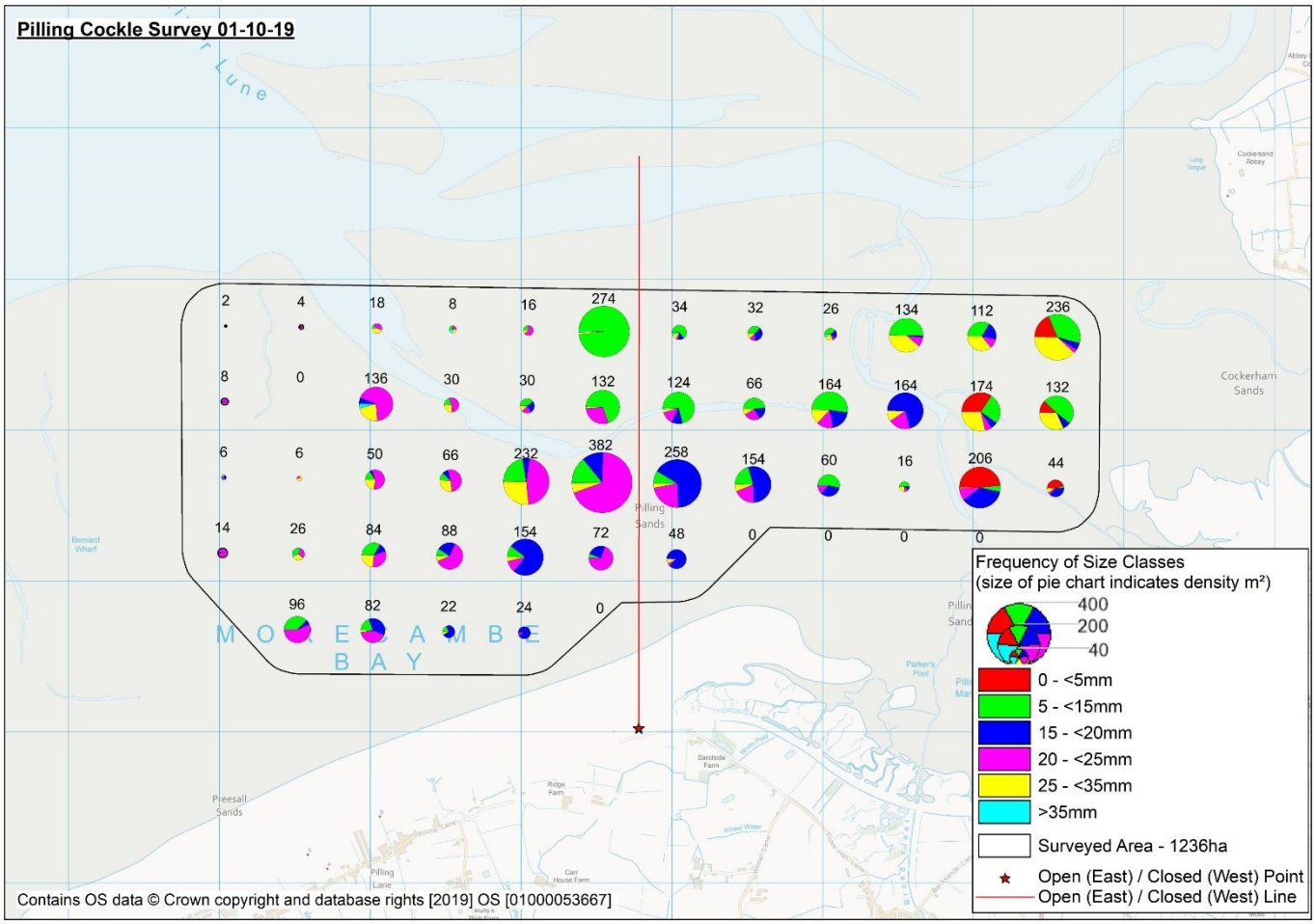
Density of size cockle per m² at Pilling Sands October 2019



Density of undersize cockle per m² at Pilling Sands October 2019



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



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

c) North Wirral Foreshore: Leasowe Cockle Survey - 1st August 2019

Tides: LW 18:56 1.1m (Liverpool tides)

64 survey stations were sampled from a 250m grid with an additional 2 stations added to areas that could not be accessed and 1 station added to include the recommended monitoring point. Due to very soft ground and the location of the tide at low water several of the survey stations from the grid could not be sampled. The density of size cockle across the bed had increased since the bed was last surveyed in June 2019, and was situated in a similar area high up the beach in a band running along the bed on the upper shore as well as in the muddy area between the groynes. The undersize cockle was distributed more patchily across the upper shore than when last surveyed, however a 2019 settlement of cockle had greatly increased the density of undersize cockle in the muddy area between the groynes, and in a discrete area of the upper shore when compared to the June 2019 survey.

Mean number of size cockle	51 per m^2	(min 0, max 182)
Mean number of undersize cockle	367 per m^2	(min 0, max 2260)
Mean number of 0-5mm cockle	117 per m^2	(min 0, max 2000)

Biomass

	Area (ha)	**Size Cockle (tonnes)[1]**	**Undersize Cockle (tonnes)**
Leasowe	**220.2**	**~1200**	**~500**

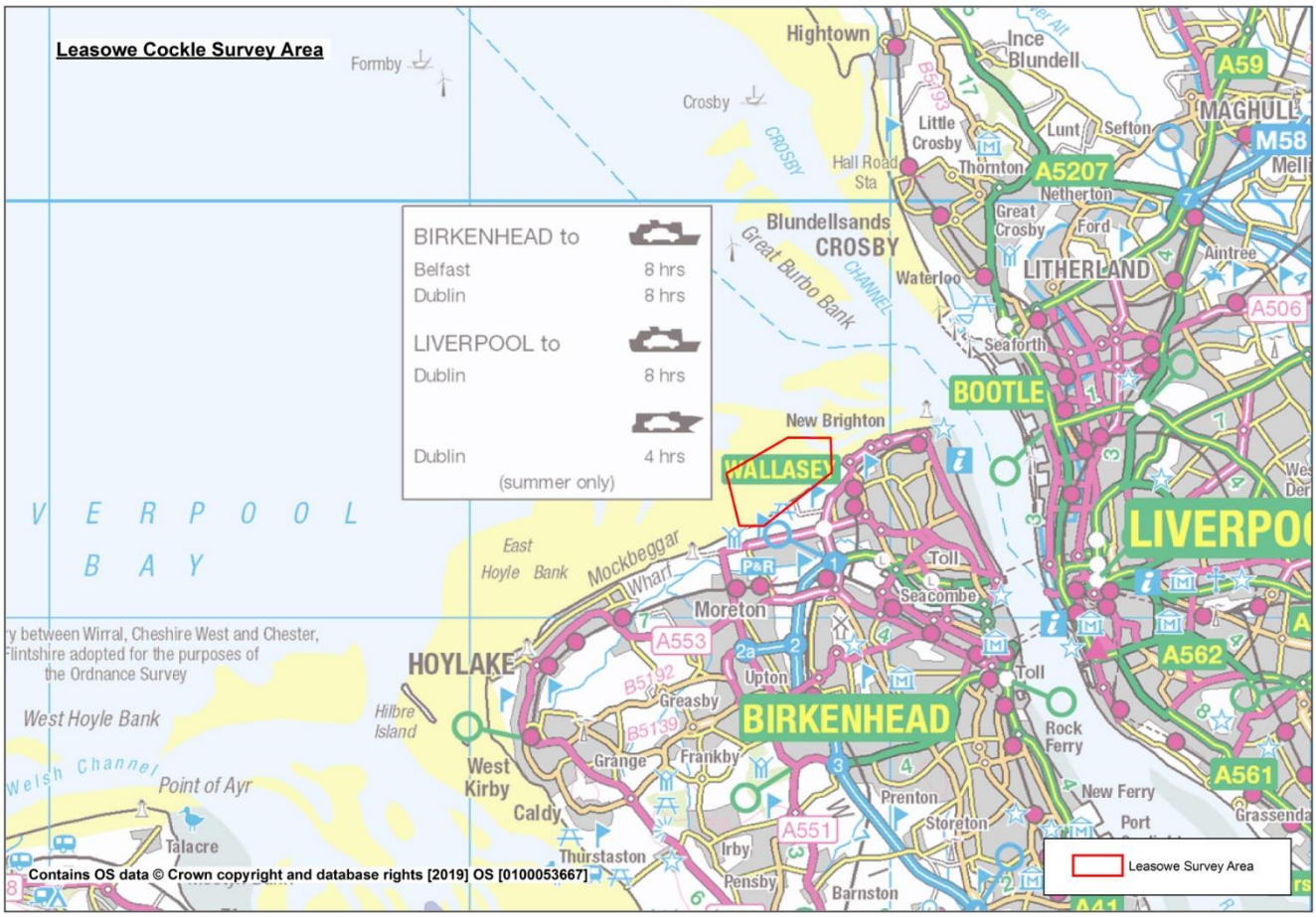
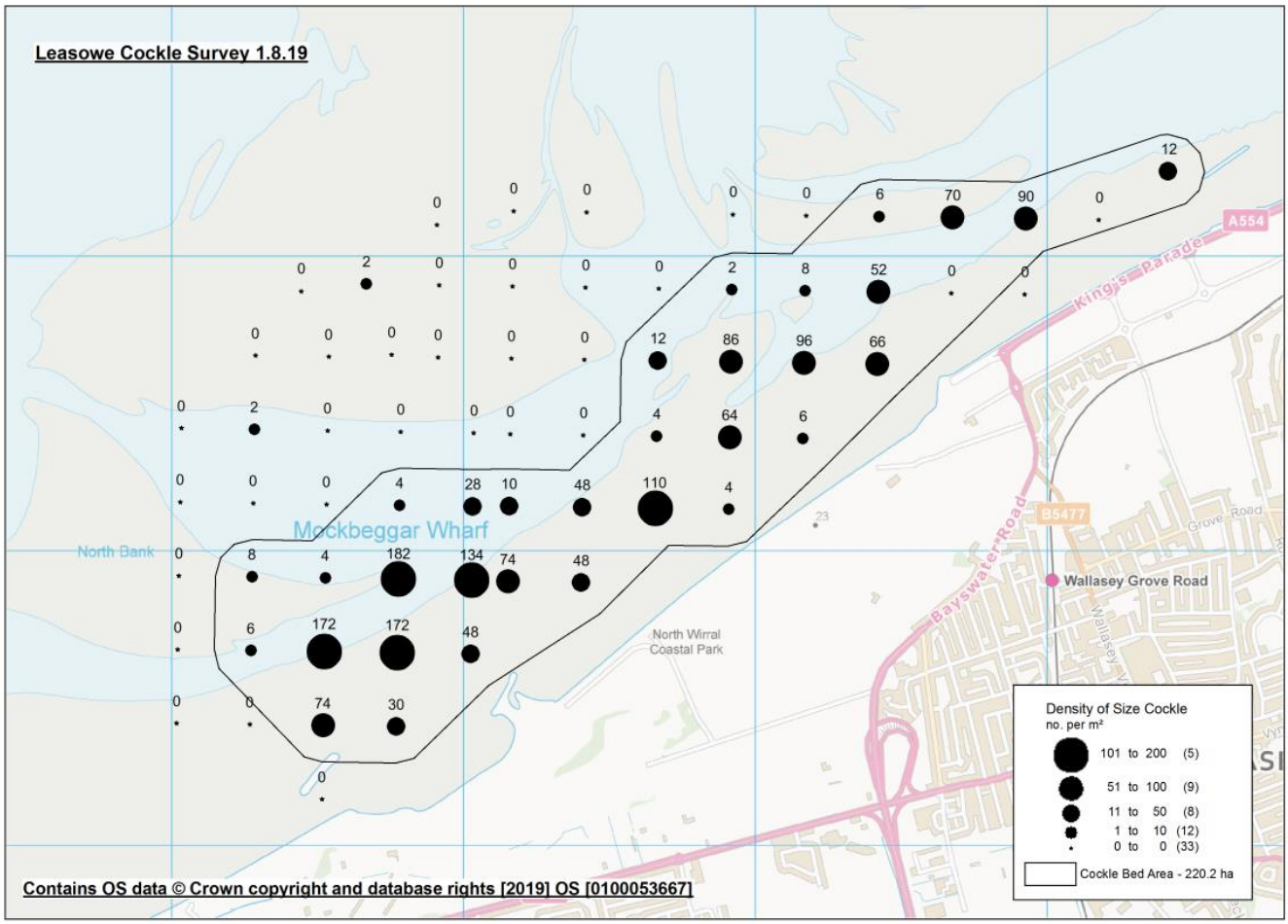
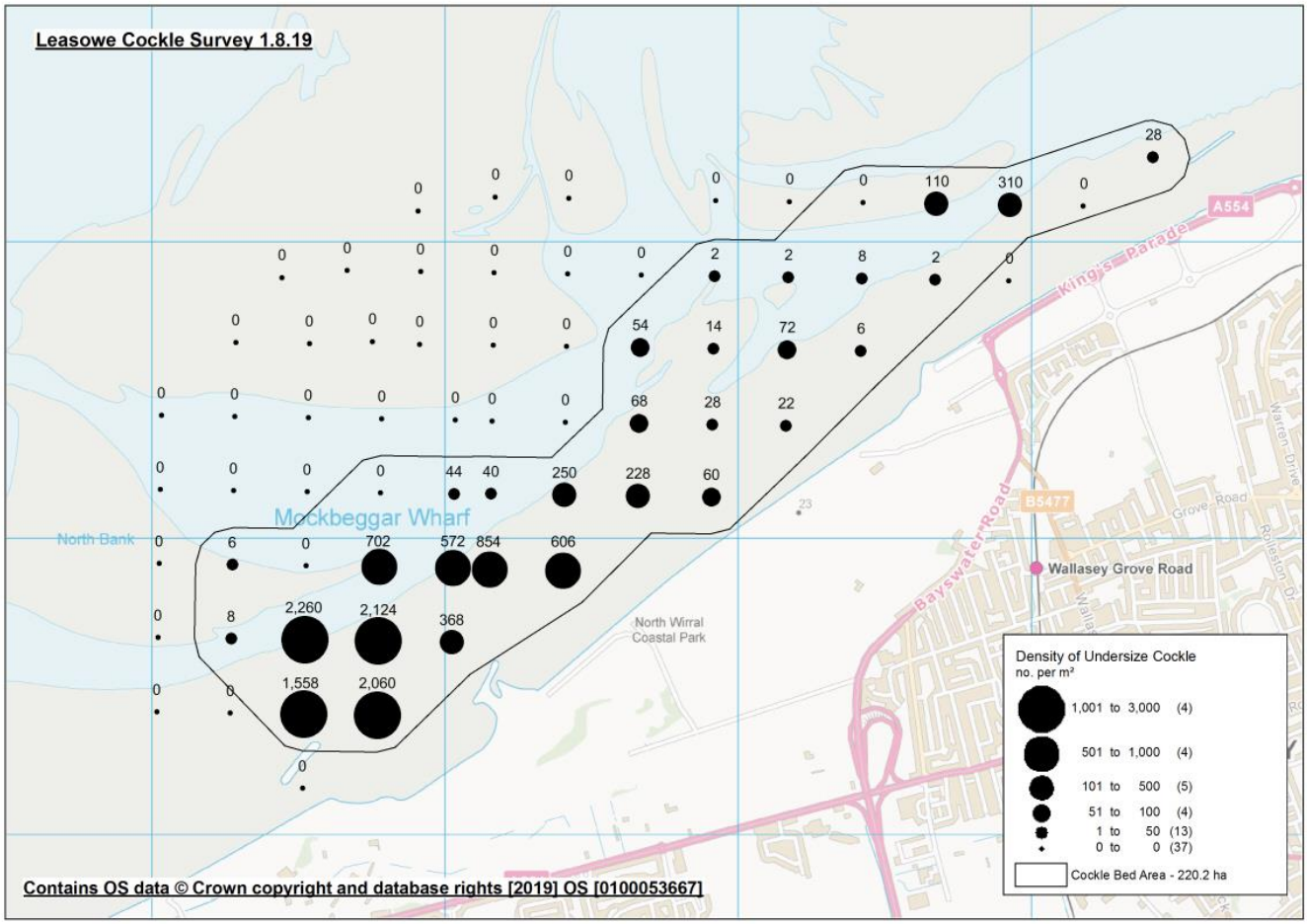


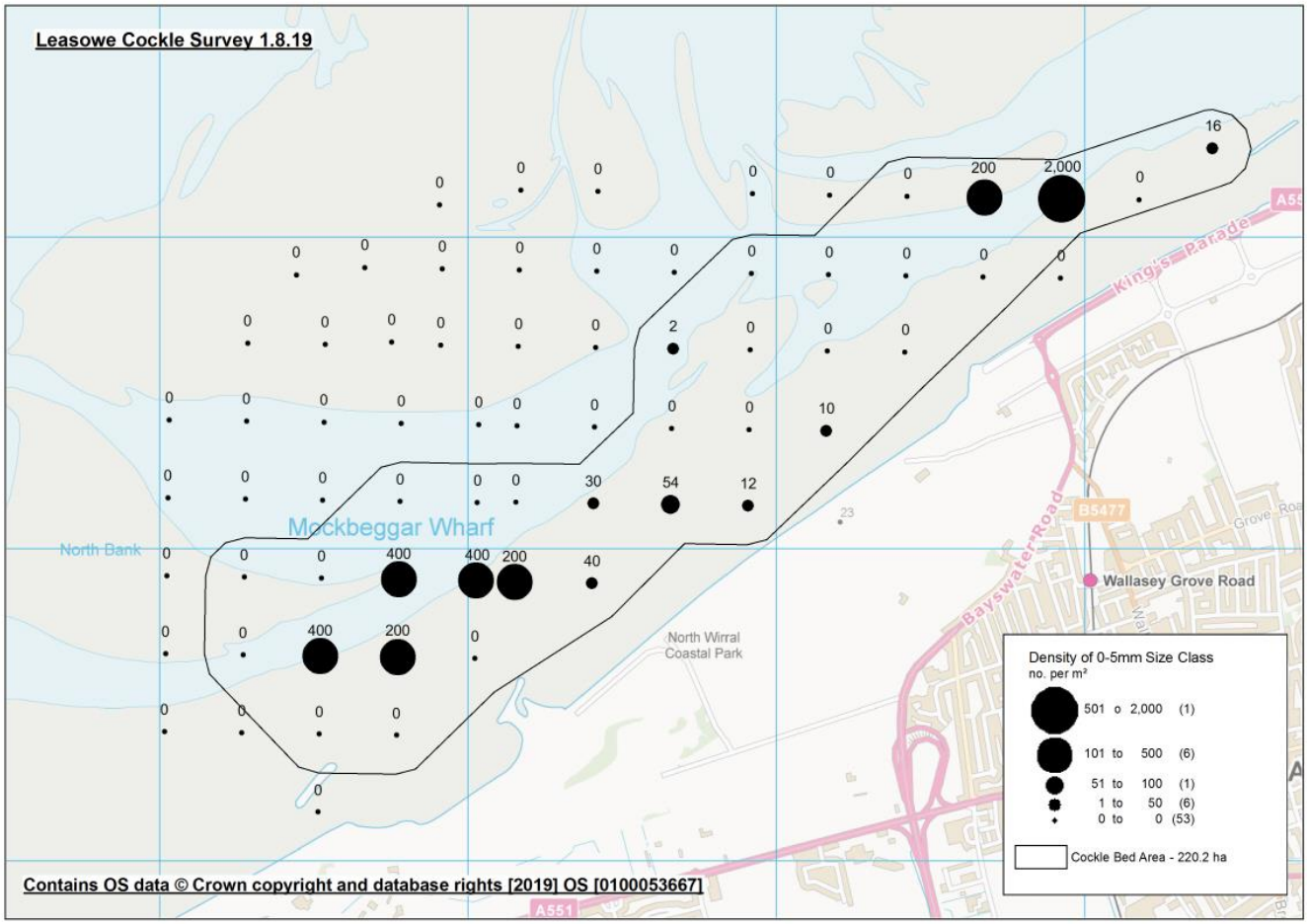
Illustration of position of Leasowe cockle bed



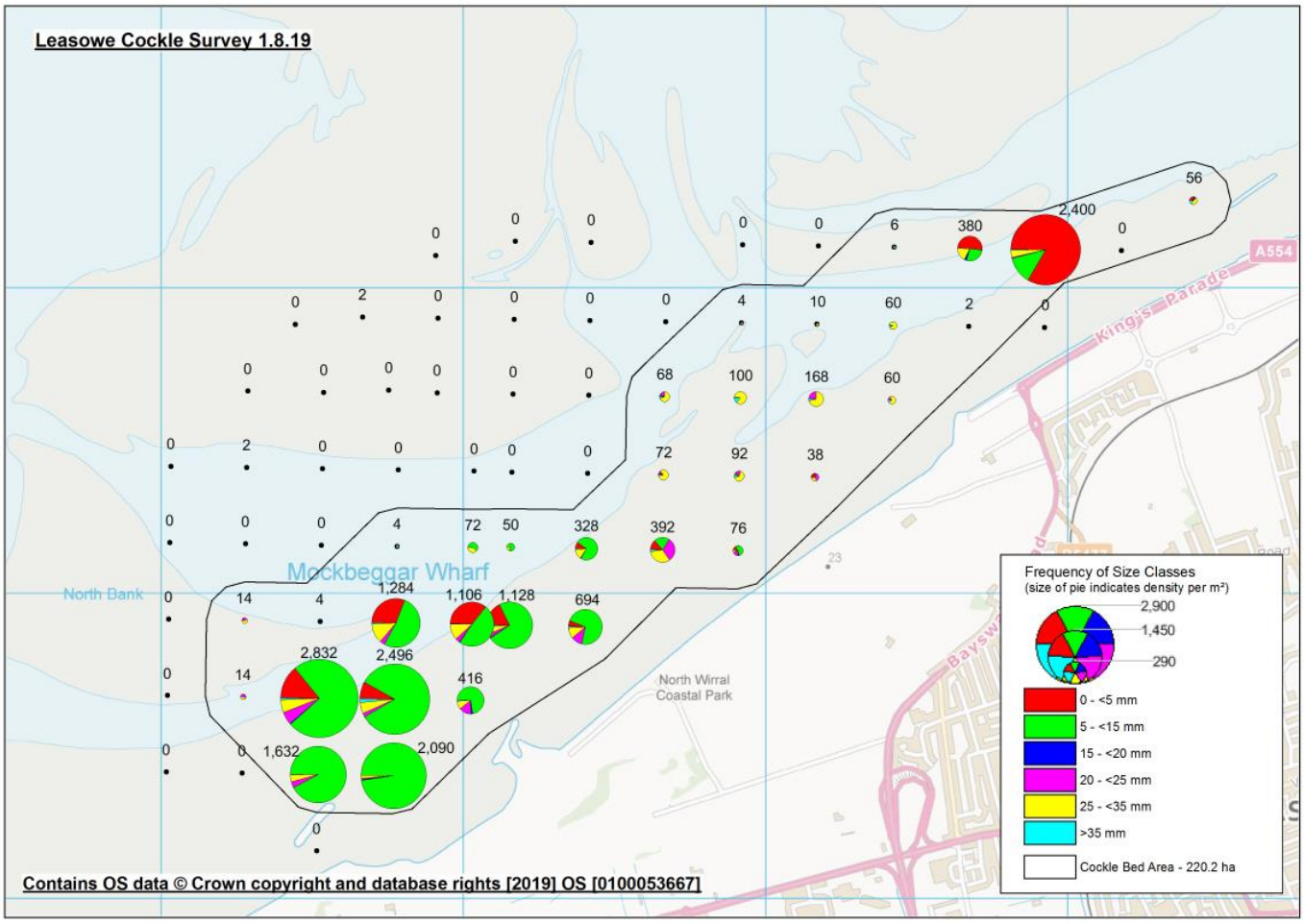
Density of size cockle per m² Leasowe August 2019



Density of undersize cockle per m² Leasowe August 2019



Density of 0-5mm cockle per m² Leasowe August 2019



Frequency of size classes of cockle per m² Leasowe August 2019