

**NWIFCA Technical, Science and Byelaw  
Sub-Committee**

**31<sup>st</sup> October 2014: 10:00am**

**REPORT  
NUMBER**

**7**

**SOLWAY FIRTH COCKLE SURVEYS**

**Purpose:** to inform Members about surveys undertaken in the Solway Firth to assess cockle stocks

**Recommendations**

1. That the report be received.
2. That Members approve the work of Officers to further investigate the possibility of opening a hydraulic suction dredge fishery for cockles in the Solway Firth in 2015.

**Background**

1. In previous years Cumbria Sea Fisheries Committee has authorised a fishery for cockles in the Solway Firth using a hydraulic suction dredge. A fishery occurred in 2003 and 2004 on Beckfoot Flats and the last time this type of fishery was authorised was in the winter of 2005/2006 for an area in the centre of the Solway Firth known as Middle Bank. This was done under the old CSFC Byelaw 21 – Cockle Permit Scheme. A basic Habitats Regulations Assessment was carried out for these fisheries and a total and daily per vessel TAC set. Since this fishery, cockle beds in the Solway have been closed due to low stocks.
2. This year officers have been made aware, via the industry, of a large stock of cockles present on Middle Bank.

**Surveys**

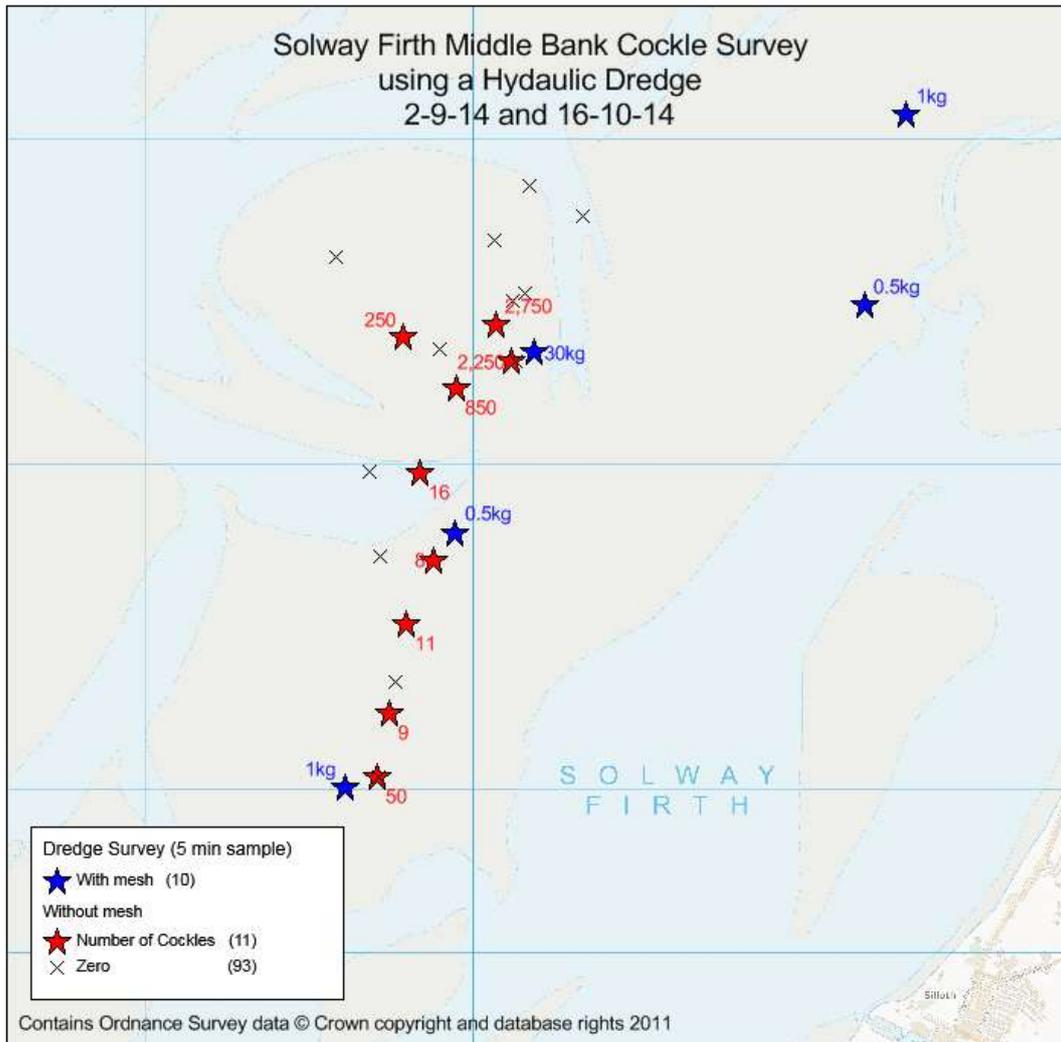
1. Middle Bank dries out at low, spring tides but due to its position it is only accessible by vessel. The large area of the bed (over 4 km in length) means that it would not be possible to carry out a representative survey via foot or ATV in the time allowed by tides. Additionally, grab sampling is not possible due to the tidal currents that occur in the area as well as the current incapacity of the 'Solway Protector' to perform this type of survey. It was therefore decided to utilise an industry vessel with a hydraulic dredge fitted to investigate cockle stocks on the Middle Bank and Beckfoot (an intertidal bed running from Silloth to Beckfoot).
2. It has also been suggested that, due to the coarse nature of the sand in this area, surveying with jumbos and on foot does not give an accurate picture of the cockles present as they are able to bury themselves deeper in the sand at low tide.
3. The dredge works by pumping a jet of water onto the sea bed in order to fluidise the substrate. Water with suspended sediment and cockles is then sucked up through a tube onto deck where it is passed through a revolving grader. This grader has spaced bars so that only cockle of a certain size is retained and passed into baskets or bags below deck. The water, sediment and undersize cockles are returned to the sea. The dredge head also has similar bars so that undersize cockle and other items are not taken into the intake pipe.
4. Dredging occurs over high, neap tides, with the window for operation depending on the height of the sandbank being dredged.

5. An estimate for the number of cockles per square meter can be calculated from results from the dredge using the length of time spent dredging, speed of the tow and the width of the dredge head.
6. Surveys using Joe Ray's (a Silloth fisherman) vessel, 'Jolanda', and dredge equipment were carried out on 2<sup>nd</sup> and 3<sup>rd</sup> of September.
7. On 9<sup>th</sup> October a jumbo survey was carried out on Beckfoot so that results from the two different types of survey could be compared.
8. Finally, another survey using the dredge was carried out on 16<sup>th</sup> October when the bars in the dredge head and grader were covered with a finer mesh so that smaller cockles were retained.

## **Results**

### ***Middle Bank***

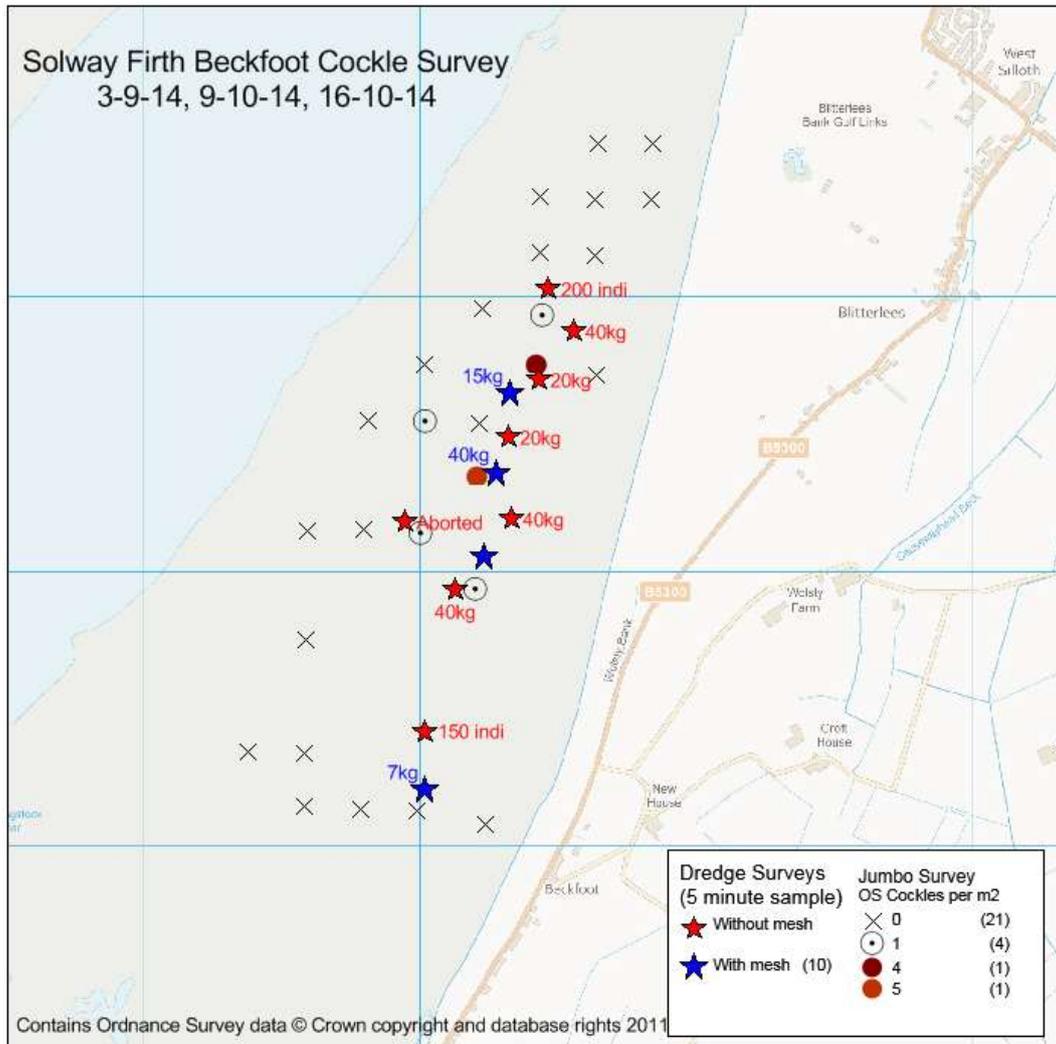
1. During the first (more comprehensive) survey, 9 out of the 11 survey sites had size cockle present. During dredge surveys Science Officers and IFCO Thinnesen were initially impressed by the volume of cockles brought up by the dredge (filling a 40 kg basket after 5 minutes of towing at 2 knots). However, when results from the surveys carried out were analysed they showed a highest density of cockle of 6 size individuals per metre squared. The second survey confirmed the location and density of the densest cockle.
2. A visual comparison between the gear with and without the extra mesh covering showed that the spacing of the bars did allow undersize cockles to escape the gear, either initially at the dredge head or in the grader. In the second survey a good mix of sizes and age classes of cockles were seen ranging from very large 5 year old cockles to 2014 settlement cockles which had grown well during the year to a size of at least approx. 15 mm.



**Figure 1. Results of Middle Bank cockle surveys**

**Beckfoot**

1. At six of the 27 stations sampled during the jumbo survey size cockle was present. The highest density of size cockle found during this survey was 5 individuals per square metre. A similar value of 7 per metre squared was calculated for the dredge survey and the highest density of cockles was found to be in the same area of the bed. Again, this was one basket, or 40kg of cockle, per 5 minute of dredge time (towed at 2 knots).
2. Undersize cockle and smaller spat were also recorded on the bed during the jumbo surveys. This occurred at 15 of the 27 stations sampled. At two stations spat (< 10 mm) occurred at densities of higher than 50 per square metre. This small spat was not picked up by the dredge equipment, even with the smaller mesh fitted.



**Figure 2. Results of Beckfoot cockle surveys**

### Cardurnock

1. Two dredge samples were taken in the Cardurnock area. The 2 minute tows did not show any quantity of cockle (one zero result and one 0.7kg). However, the whole area was not surveyed.

### Future Work

1. The surveys undertaken this autumn have provided officers with an understanding of the hydraulic dredge gear and the characteristics of the cockle beds in the Solway. Further analysis of these results will indicate how this type of survey can be best utilised to produce information to inform management of this potential fishery.
2. The potential area for cockle stock to occur in the Solway Firth is very large. Future surveys should aim to cover a greater area. However, there is a compromise to be made between coverage and time allowed to carry out surveys.
3. As with any new surveys or a fishery a Habitats Regulations Assessment will be required. Completion of this document will require considerable research and liaison with Natural England.
4. Cockle dredge fisheries are permitted in both the Wash and Thames are managed under Order by their IFCA's. Investigation of the survey methodologies and management measures used in these areas will be instructive in making management decisions for the Solway.

## **Management Considerations**

1. The results of these surveys show that there is not sufficient stock on either bed to immediately open a fishery in the Solway. However, the large number of undersize cockles observed and the fast growth rate seen in the Solway means that there may be potential for a dredge fishery to operate in 2015; possibly on Middle Bank.
2. In the past the number of authorisations issued to dredge have not been limited. At the last fishery 11 authorisations were issued, although not all were used. If limiting the number of authorisations is required in any new fishery then the mechanism for allocation must be reviewed. This could be run on track record as with other fisheries such as the South America seed mussel fishery.
3. NWIFCA Byelaw 3 does not include these beds as a designated commercial area. Therefore, consideration of how to manage gathering for personal consumption, particularly on the highly accessible Beckfoot, will be required if the beds were to be opened.
4. The Middle Bank runs up to and crosses the dividing line between Scottish and English waters. This may present an added enforcement burden and therefore collaboration with Scottish authorities will be required. Additionally, for Habitats Regulations Assessments and other considerations the Solway should be regarded as a whole; again requiring collaborative working between the NWIFCA and statutory nature conservation bodies across the border.

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**21<sup>st</sup> October 2014**