Intertidal Cockle Stock Assessment Survey Methodology

Equipment

Waterproofs + wellies
Life jackets
Handheld GPS, plus spare batteries (one per team)
Gridded chart of survey area with coordinates
0.1m^2 Quadrat (one per team)
Sieve (one per team)
Plastic bags
Waterproof paper labels
Waterproof notebook
Buckets
Trowels
Gloves
Digital scales
Callipers
Survey Forms
Weather Writer clipboard
Pencils

Rationale

The objective of this survey is to carry out annual surveys of the cockle beds, to determine the available stock. Devon and Severn IFCA will undertake a stock assessment on each of the beds to estimate the density of cockles on the beds and the total stock. Results of these surveys can be compared on an annual basis. This will help inform future management of the cockle beds, and the development of shellfisheries in this part of the Devon & Severn IFCA District.

These surveys are carried out on the Exe and Teign Estuaries.

Logistics and Practicalities

These surveys are usually carried out in the autumn, during October or November. The best time for the surveys is at low spring tide, when the greatest extent of the beds will be exposed.

Mud can be a serious safety risk on this survey; always work in pairs, wear tight wellies and keep an eye on the tide.

The survey works best with two or three teams working at once, to cover all the sampling points in one tide. The survey is usually carried out in teams of two, but also works well with teams of three if there are enough staff/volunteers available. The survey methodology is very straightforward, and could be carried out by volunteers, supporting an IFCA Officer, with very little knowledge of marine biology.

Survey Methodology

On the Estuary

Predetermined sampling points are used, so the same points are revisited each year (Figure 1). A handheld GPS is used to locate the first station e.g. A1 and a quadrat is randomly placed within 10m of the target position for that station.

Using a trowel, the sediment is dug out of the quadrat (up to approximately depth of the quadrat) into the sieve and then sifted in water nearby (Figure 2). The cockle(s) are put into a sample bag with a label of the site name (one bag per station). If no cockles were found or the site was unable to be surveyed it was noted. This is repeated at all stations.

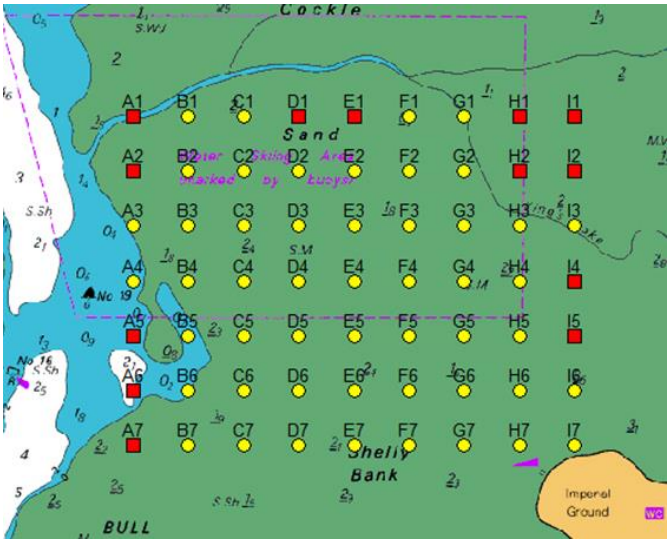

Figure 1 – The sampling points used on the Exe Estuary (with points that are known to be difficult to access, due to mud or water level, shown in red)

Figure 2 – Sample collection

Off the Estuary

For each station sample, cockles are measured by callipers to the nearest millimetre for length and height (Figure 3).

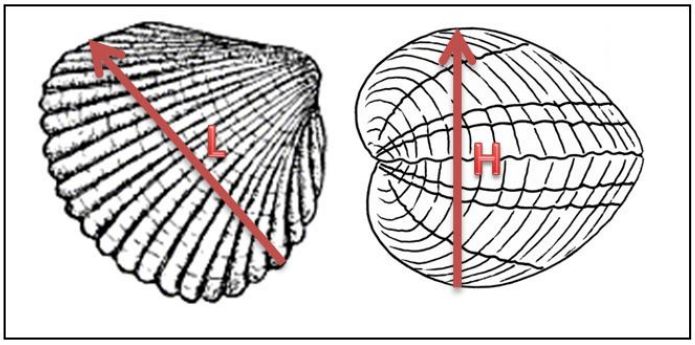

Figure 3 - Cockle length and height measurements.

After measuring, cockles are sorted into year classes by determining how many growth rings are on the shell e.g. 0 rings = current year, 1 ring = last year, 2 rings = year before last and so on. Each year group from that station are weighed separately (to the nearest 1g) and recorded. This is repeated for all station samples and once finished all the cockles are returned to the estuary.

Data interpretation

Data from these surveys is entered into Microsoft Excel and from this size frequency and year class graphs are produced. To determine cockle density, the data is transferred into Mapinfo GIS software to produce the maps. The minimum density used to determine the extent of coverage on the bed is 10 cockles per m^2. The biomass has been calculated from the mean weight and cockle bed area.

Relevant Documents:

Width & Height Survey Form

Width & height.xlsx

Year Class & Weight Survey Form

Year class & weight.xlsx