

Intertidal *Sabellaria alveolata* Survey Methodology

Equipment

Waterproofs + wellies
Life jackets
Camera
Handheld GPS (plus spare batteries)
0.25m² quadrat
Tape measure
Weatherwriter clipboards
Field ID guide

Co-ordinate sheet
Sabellaria assessment criteria
Transect survey sheets (waterproof)
Quadrat survey sheets (waterproof)
Map of intertidal zone
Cut-out letters & numbers (waterproof)
Pencils

Rationale

‘Reefs’ are specified as an Annex I habitat feature for designation of the Severn Estuary SAC, particularly intertidal aggregations of *Sabellaria alveolata* which are found throughout the estuary. These biogenic reefs provide a complex substrate for attachment of flora and fauna, and protective cover for motile invertebrates, therefore increasing biodiversity and having wider implications for local food webs. It is important to gain a better understanding of the extent and quality of these reefs.

The methodology for this survey is based around that used by the Countryside Council for Wales (CCW) in Cardigan Bay SAC (Moore, 2009), although this was slightly refined for IFCA purposes to increase the resolution of the data. The survey consists of two components which can be done simultaneously; transects running perpendicular to the shoreline to determine vertical zonation of the reef in terms of age and quality, and quadrats regularly spaced along these transects to determine elevation, percentage cover and complexity of the habitat, in addition to quantification of associated organisms.

Logistics and Practicalities

Sabellaria alveolata surveys should always be timed with the lowest of low spring tides, as much of the reef may not be exposed on a neap tide. This is an incredibly tricky survey in terms of timing – you may only have 2/3 hours in which to gather data, so organisation is key!! It may also be necessary to partially complete transects and then return to complete the lower segments as the tide drops. Keeping a map handy with transects plotted on is useful if you have to work this way, as it keeps you on track with your progress. It is also useful to have several pairs of surveyors working in teams along the shore.

There may be seasonal variations in this habitat due to weather disturbance or recruitment, therefore it is advisable to complete the survey at a specific location within as short a space of time as possible (i.e. a few weeks).

Survey Methodology

1. The survey is based around a series of transect lines running perpendicular to the shoreline, with quadrat points at regular intervals along it. It is essential that you do a recce at each site to assess conditions and reef extents, then work out what you can feasibly manage.

For example: We began our assessments of the Severn reefs at Hinkley Point (Somerset), the rocky outcrop on which the *Sabellaria* is found is quite large, however the reef was only found in a narrow strip at the very

bottom of the foreshore. We therefore decided to place transects 100m apart running perpendicular to the shore, with quadrats every 5m within the *Sabellaria* zone.

When you have settled on your resolution, plot your transects on GIS and if possible programme start and end points into your GPS. It is not necessary to plot the quadrats if they are close together, they can be measured out by hand. If you aren't sure of the upper limits (*Sabellaria* can be quite patchy) then start the transects high on the shore and walk down them to eliminate the possibility of missing any areas out. There is no need to record any quadrat data until you hit the *Sabellaria* zone.

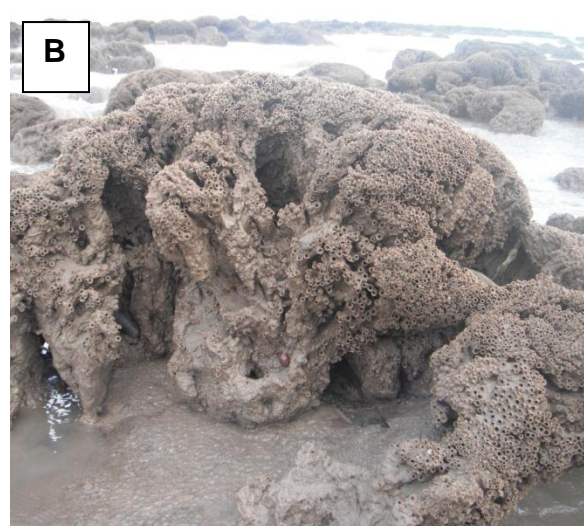


***Sabellaria* Transects at Hinkley Point**

2. Start the survey at the beginning of a transect, and walk towards the sea. Search periodically for *Sabellaria* underneath algae, and between cracks and rocks. Although good quality reef structures are unmistakable, when *Sabellaria* is degraded or low-lying it may require a closer look (see below).



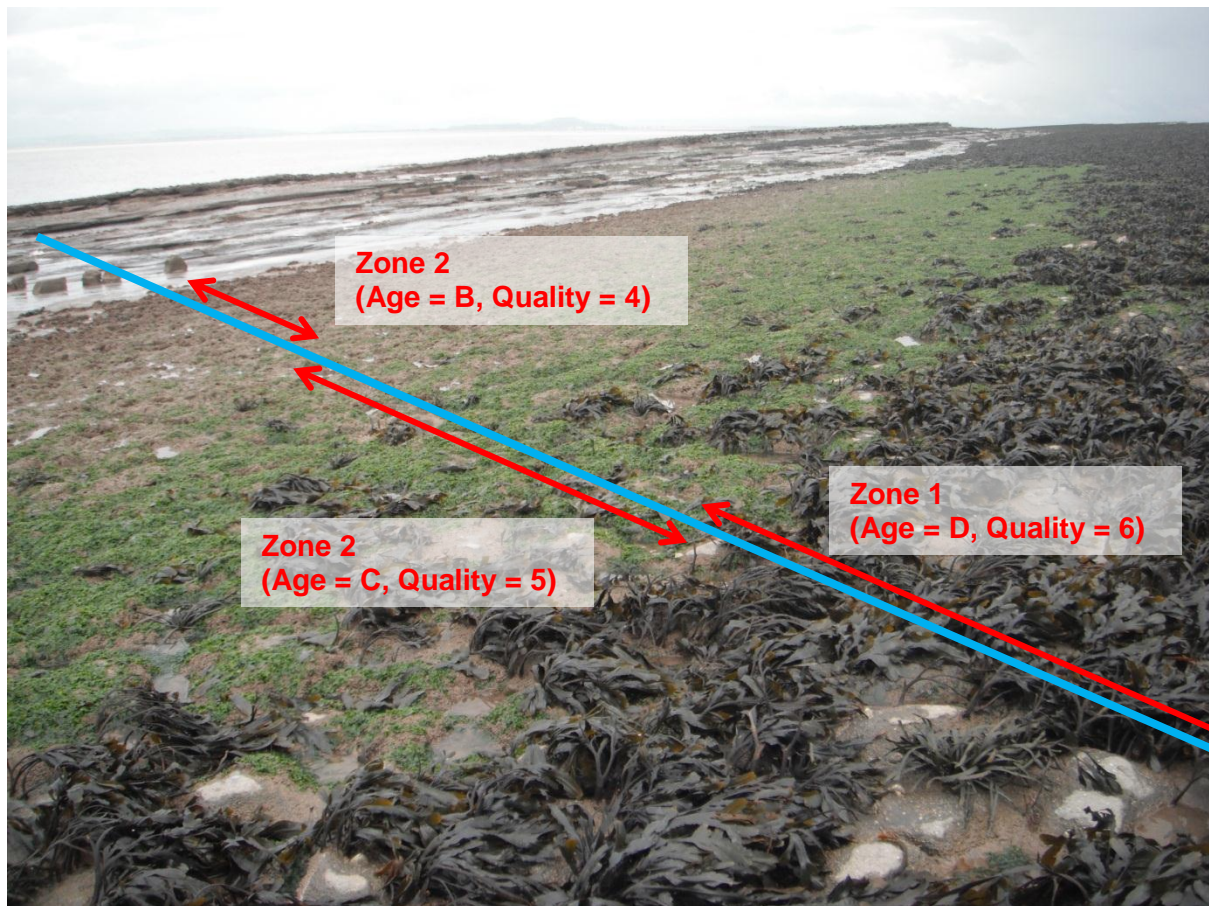
A) Low-lying degraded *Sabellaria alveolata* high on shore inbetween rock with attached *Fucus serratus*



B) High quality *Sabellaria* aggregations close to the low water mark

3. When you hit *Sabellaria* take a GPS reading and use the assessment criteria (supplied with this SOP) to assign values for age and quality. These can be a bit subjective so read through these as you go, and choose the most accurate description. You will need to repeat this every time the *Sabellaria* shows changes in either

of these criteria along the transect. Each of these discrete areas along the transect are a 'zone' and may be sometimes be indicated by a change in algal cover.



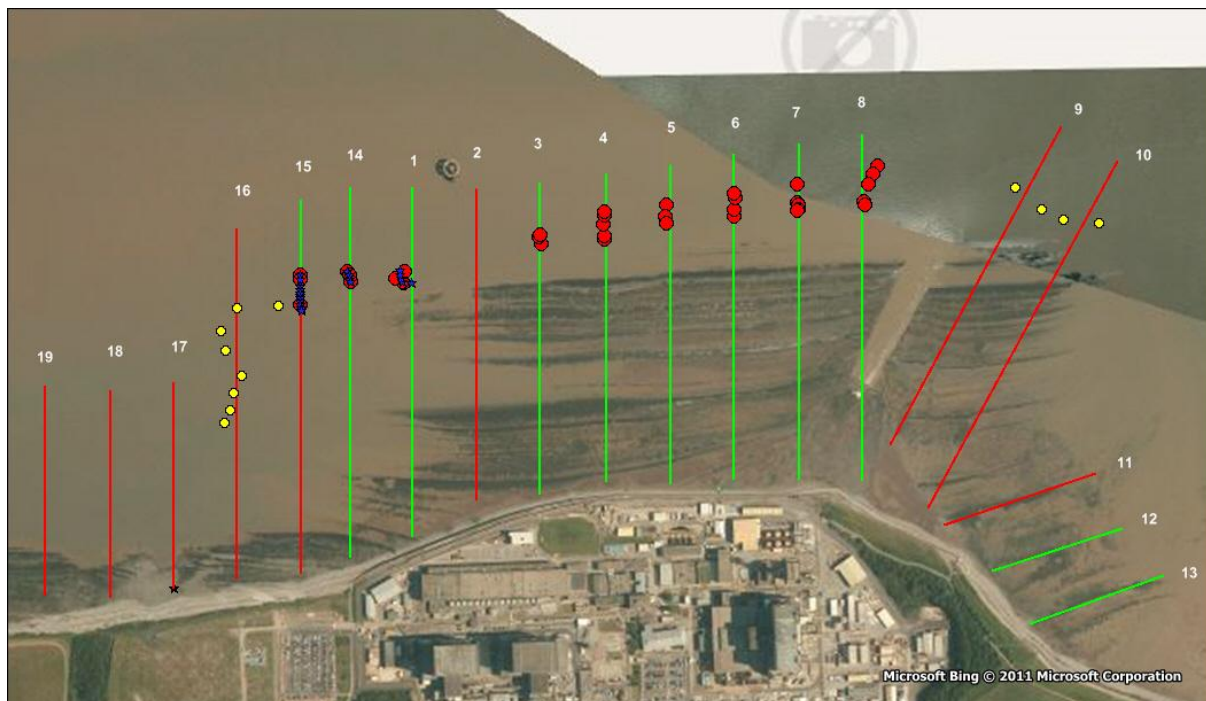
Recording *Sabellaria* zonation along a transect

4. Record the age and quality values on the transect form, along with the start and end co-ordinates of the zone and a brief description. Also take a representative photo.

5. At the start of the first *Sabellaria* zone, throw down the quadrat randomly. Take a photo from above, with the cut-out numbers and letters indicating the transect number and quadrat letter (much easier to sort in the office but not essential!). Switch to the quadrat form and record co-ordinates, corresponding zone quality and age.



6. Take five elevation measurements, one in each of the four corners and one in the centre. If there is no *Sabellaria* in the corners then measure the closest bit. If there is none in that entire quadrat quarter then record a 0.
7. Record percentage cover of standing water, % cover *Sabellaria* and % cover live *Sabellaria*. Live *Sabellaria* can be determined by looking at the ends of the tubes. Tubes containing live worms will have well-defined and maintained apertures.
8. Record percentage cover of algae (canopy) - this is likely to add up to >100%. Also record percentage cover of sessile invertebrates such as barnacles and limpets, and note the species. There is also space to note down numbers of other species encountered such as *Nucula*, *Littorina* etc.
9. When all variables have been recorded then measure out 5m (or your chosen distance) from the quadrat along the transect, and place the quadrat there. Be careful at this point, as you may have crossed a *Sabellaria* zone transition, which will need to be recorded. It can get quite confusing swapping between the two, but doing both together is the most time-efficient option.
10. Continue along the transect recording zones and quadrats until you reach the water. It should be noted that *Sabellaria* generally extends below the low water mark, so don't take this as the lower limit.
11. If you are skipping around between transects trying to make the most of the tiny tide window it can get incredibly complicated to try and remember where you got to, and whether you did quadrats etc. Make sure you keep detailed notes even if in a rush! When I get back to the office I generally try and make a visual record of what is still left to do, so I'm not too confused when the next survey day comes round (see below).



Red dots = zone start & finish points, blue dots = quadrats done, yellow dots = previously observed *Sabellaria* upper limit. Red line = transect not yet completed, green line = transect completed

References

Moore, J. (2009) Intertidal SAC Monitoring, Cardigan Bay SAC, May 2007. CCW Marine Monitoring Report No: 57, 69pp + vi, Countryside Council for Wales, Bangor.