

Divers' Guide to Sediment Veneers.

Mobile sediment on hard surfaces is a powerful modifier of the sessile community on that hard surface. Where mobile sediment modifies a community, it has come to be called a sediment veneer.

Veneers are important because they:

- 1 Harbour species which appear to specialise in veneer habitat e.g. the nationally scarce sponge *Adreus fascicularis* and the alga *Ahnfeltia plicata*, black scour weed.
- 2 Are quite common.
- 3 Are seldom-recorded.
- 4 Do not attract protection in their own right under the current regime of feature-driven UK marine conservation designations, although they do appear in EU guidance as part of reef features.
- 5 Can be difficult to record with drop-down/towed video.
- 6 Form an important component of landscape-scale marine habitat mosaics.

What is a sediment veneer?

"A deposit of sediment on top of reef which is thin and/or mobile enough so that sedentary species can colonise and grow on the hard surface of the reef through or under the sediment veneer. Two geological components (reef and overlying sediment) combine their effects towards determining the community."

Alternatively the Interpretation Manual of European Union Habitats, Eur 28. April 2013. European Commission DG Environment states: "Such hard substrata that are covered by a thin and mobile veneer of sediment are classed as reefs if the associated biota are dependent on the hard substratum rather than the overlying sediment".

Here is a picture of an infralittoral sediment veneer from shallow water off the cliffs of Durlston Head, Dorset taken with a GoPro in 8m viz and around 9m of water:



On the right there are blobs of algae. From this picture (or a low resolution video run) they might be assumed to be drift. Below is a GoPro close-up of the blob arrowed and a macro shot:



The diver's finger is touching bedrock through the layer of sand. The alga is growing on rock and is black scour weed (*Ahnfeltia plicata*) a long-lived red alga resistant to scour and to covering by sand. This clump has comb weed (*Plocamium sp.*) growing on it and the bryozoan *Electra pilosa*.

Filling in a form to record a veneer.

For an Observer form for the Durlston Head dive, the best thing would be to write: 'Sand veneer, 80% cover on bedrock' in the 'anything unusual or noteworthy' box on page 3 under the diagram. The current Seasearch Surveyor paper or interactive forms are a bit more tricky - they are best suited to recording 'rock' or 'sediment' and veneers include aspects of both. Interactive form snapshots are used here (it is much easier to process the data from them) and we explain how, but paper forms are actually easier for the diver as comments can just be written in. Using the Durlston dive as an example:

Seabed summary

Summarise: a. The main features of the site, b. Any unusual features or species, c. Any human activities or impacts at the site

Boulders at the base of cliffs (Habitat 1 not surveyed in detail) leading onto a wave-cut platform H3 with a veneer of varying thickness of mobile, clean coarse sand with mixed algae and turf growing through shallower sediment and deeper sand with coralline algae beneath and various red algae growing through. Patches of clean, mobile rounded cobbles on pitted bedrock with rare coralline crusts at base of boulders (H2). Habitats in 4.5 to 6.5m BCD, cliffs face southeast.

Rock and boulders Purbeck stone.

b. None. c. None.

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Page 1 of 6

And for the habitat descriptions:

1. DESCRIPTION (physical and community)

Boulders and large slabs fringing cliffs (cliffs not surveyed) supporting mixed algae, coralline crusts and rare sponge crusts. Horizontal surfaces with thin and discontinuous veneer of medium sand, approx 30% coverage. Vertical surfaces with a more diverse turf including algae, tunicates, bispira and sponges not surveyed separately. Some sloping surfaces with Rhodothamniella floridula noted and photographed. Rock mills in horizontal surfaces, some with active cobbles observed. 4.5 to 6.5m BCD.

And Habitat 3 (shown in the pictures above):

3. DESCRIPTION (physical and community)

Horizontal rocky reef beyond boulders with a sediment veneer of mobile clean, rippled, coarse sand of varying depths to 10cm approx with red algae such as Ahnfeltia plicata (with epiphytes) growing through deeper sand with coralline crusts, occasional Spirobranchus tubes and brown crusts on rock beneath. Shallower sand had mixed algae and sessile fauna growing through and coralline crusts beneath. Veneer present on 80% of habitat. 6.3 to 7.3m BCD

Biotope Code

Seabed type: rock boulders cobbles pebbles gravel sand mud wreckage other

Communities: kelp forest kelp park mixed seaweeds seagrass bed enc pink algae

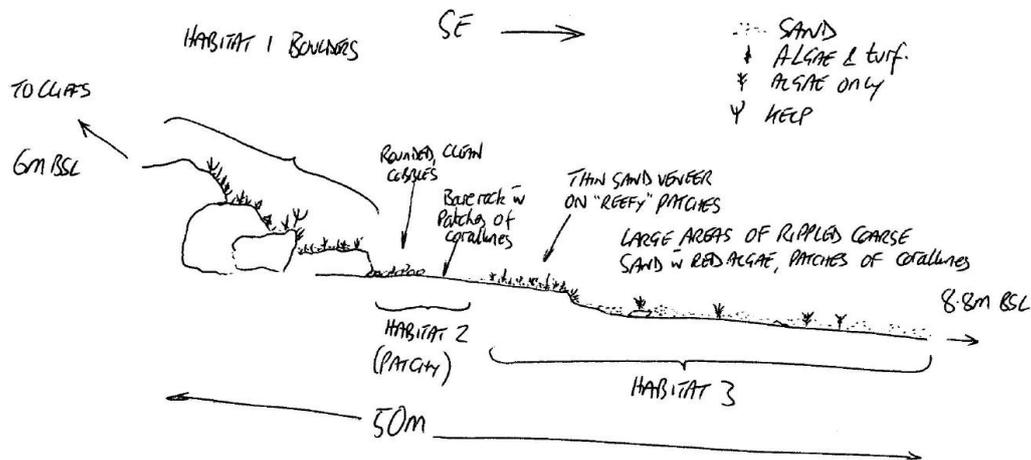
animal turf animal bed sediment with life barren sediment

If you see a veneer, write it into the descriptions (red circles). Habitat 2 is not a veneer – it is sediment because the cobbles are frequently mobile.

The 'substrate' section for Durlston looks as below. Note no percentages appear for sand. But habitat 3 (the veneer in the photos) was 100% bedrock 80% covered in sand. It might seem logical to fill in '80%' for 'sand'... But 180% for substrate in a habitat does not compute for the Marine Recorder software the data goes into and would make things very confused. So, as the red circles show below, 'sediment' percentages are left blank, the 'sediment on rock' box is ticked and notes need to be written on the form as would be done for the paper form.

Detail of veneer composition is very helpful. If you have two habitats or less, 'co-opt' a column in the substrate percentages for the veneer and label it clearly. Or you could add a set of figures and a labelled column head near the percentages on the form (see above) or add a reference to page 6 on the interactive form and add notes and percentages for the veneer there. The veneer composition may affect fauna and flora. It may be something very odd such as a veneer of dead and live maerl in waves over vertically-bedded bedrock with worm tubes protruding through the veneer and slabs with coralline crusts under it. This was recorded in St Austell Bay in 2017. Sediment composition notes for the Durlston form were made from macro photographs.

And the diagram for the Durlston dive:



Here is a more-complicated habitat mosaic featuring veneers which was encountered in the circalittoral at a site called The Smarties in Lyme Bay in 2017



Many different (small-scale) habitats: Elevated reef (white), flat reef with thin veneer (yellow), cobbles/pebbles (stony reef) and muddy sand (pink), silty sand sediment veneer over flat reef (red). The reef units were around 75cm high and could be sub-divided into three habitats: 1 Clean reef tops with tall sponge and bryozoan turf, 2 Verticals with sponges and squirts and 3 Overhangs (not surveyed due to small scale and lack of time).

This site was in 20m of water. Three habitats fully surveyed by two experienced and enthusiastic Surveyors working as a team and diving on nitrox is possible. Six habitats in the 40 minutes or so available? Not realistically do-able! When you find a beautiful, rich and varied habitat like this, it is best to record something like the snapshot below. The important keywords 'mosaic' and 'veneer' and 'stony reef' are prominent in the first paragraph. The shallower three habitats (on the reef units) were not recorded in the knowledge that other buddy pairs would likely concentrate on them. Mention of their presence is in the second paragraph to ensure that any snapshot taken from Marine Recorder for this dive grabs the habitats recorded in detail. If you can't manage 3 habitats in detail, try for detail on two, or one and do your best on those whilst recording the existence of others. The Seabed Summary for this site would look like:

Seabed summary

Summarise: a. The main features of the site, b. Any unusual features or species, c. Any human activities or impacts at the site

Rich mosaic of veneered bedrock and stony reef habitats between 23 and 23.5m BSL on mostly - flat seabed with small bedrock reef units. Survey recording confined to stony reef (small boulders, cobbles and pebbles with muddy gravel) supporting silty turf of sponges and tunicates with occasional red algae (Habitat 4), flat, low-lying bedrock with a thin veneer of silty sand and shell fragments supporting species such as *Eunicella*, sponges (Habitat 5) and areas of deeper veneer in hollows with sparse tall turf including *Eunicella* and *Protula*, plus *Ophiura albida* (Habitat 6).

Reef units to 22.6m BSL, (approx 75cm above surrounding sea bed) not surveyed in detail but supported clean turf of sponges and erect bryozoans with tunicates and occasional red algae on the tops (Hab 1), verticals with clean sponge-dominated turf with tunicates and bryozoan crusts (Hab 2) and abundant small-scale overhangs (Hab 3, not surveyed). 7th habitat (small areas of sediment with infaunal brittlestars) not surveyed.

b) *Eunicella verrucosa* (Hab 4,5,6) *Aiptasia* (Habs 1,2,3,4) *Phallusia mammillata* (Habs 1,2,4,5) c) none observed

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Page 1 of 6

Habitats on the form would be numbered 4,5&6 as they were the deepest habitats seen. Habitats 1-3 and 7 won't appear on the form after the Seabed Summary unless you choose to add some more detail on page 6. If you do this, please signpost that you have used page 6 as your form may be part-way through a huge stack and the data entry person may otherwise miss the detail.

Silt can also act as a veneer. The next photo is from the Scillies at 30m with *Rhodophyllis irvineorum*, and veneer specialist sponges *Homaxinella subdola* and *Polymastia spp.* The seldom-recorded stalked squirt *Bolteniopsis prenanti* (see Sea Squirts and Sponges Guide) is also present in this view, but is tiny.



The next picture is taken from a PowerPoint presentation and shows a habitat seen on a dive in Norfolk in 2011.

East Runton 20110804 fine sand over chalk with algae. Wide view with diver for scale and bigger pic for more detail. Community here (in August) consisted mainly of



annual and perennial algae, sparse but quite diverse with some uncommon species. Substratum and sediment both affect community and perennial species say 'veneer'.



A bit more on why veneers are important:

Algae and sessile fauna require hard surfaces on which to settle and establish. If a sponge was to try and settle on mobile sediment it could not establish successfully, so at some point in time suitably 'clean' surfaces must exist to allow establishment. This mobility (leaving periodically bare surfaces for settlement of 'rock' life) is a key feature of veneers. Not all species which might settle when the sediment is not present can survive when it comes back. Various *Polymastia* sponges with their 'chimneys' that stick out of sand or silt and some tall species like pink sea fan happily cope with veneers and in the Lyme Bay closed area are becoming ever more obvious as time goes on since the closure to bottom-towed fishing gear in 2008 – long-lived species needing hard surfaces under a veneer seem to build up over time.

On the other hand, if you have sediment over hard substrate with life in the sediment only (not on the hard substrate), then you don't have a veneer – you have a layer of 'sediment with life apparent'.

Veneers may be present in small patches, each too small to qualify as a biotope, but taken in aggregate on a dive they can easily exceed the 25m² to qualify. Veneers can be found on bedrock, stony reef and biogenic reef.

And remember:

- Sediments may be frequently mobile or may be mobile on an annual or even longer basis.
- Sediments of larger particle size need more energy to be mobilised, therefore would be moved less frequently than smaller-sized particles. 'Subsurface coarse layer' may apply to a component of (say) gravel in a veneer – the gravel will also move, but only in storms, not just in 'too-rough-to-dive weather' and will settle out before finer material.
- The precise definitions for mud, silt and fine/medium/coarse sand need a set of standard sieves in a lab. Not practical on a dive, but an estimate is possible using the feel of the sediment between the fingers and macro photos of the sediment. Photographs of typical sea bed are always good!
- If Long-lived sediment infauna (cucumbers, bivalves) which do not attach to hard substrate are present, then in all likelihood the sediment in that location is not a veneer.
- Bottom-towed gear or a stormy winter may convert a veneer to a layer of sediment by re-setting the colonisation process by wiping the hard surface clean of sessile species so that all a surveyor will see is 'mobile sediment on hard surface'.
- Silt can also be a veneer.
- Scour. A veneer is composed of mobile sediment, so scour must occur as the sediment particles move across the rock surface. If you see scour, record it please!
- Your veneer needs to cover an area greater than 25 square metres as a unit or in aggregate on your dive, the same as for any biotope.
- 'Sediment' includes mud, sand or gravel (pieces less than 16mm in largest dimension) pebbles and cobbles. But pebbles over 64mm largest dimension and larger rocks may form stony reefs if they are stable enough.
- A veneer community can accumulate on any 'reef' feature including stony and biogenic reefs as long as the components that provide the hard surface are stable enough.
- Veneers may be important components of habitat mosaics which may be made up of several habitats. It is often tempting to record mosaics as 'mixed ground', but because the data is valuable, please try not to do this. Instead it is better to aim to record that a mosaic has been seen and record a couple of its component biotopes in detail, noting the others.

Thank you for filling in Observer or Surveyor forms. All records are precious.

Happy Seasearching.

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