An underwater photograph of a reef. The foreground is dominated by a large, dense colony of light-colored, branching coral. Below this, there is a prominent, large, translucent, light blue sponge with a porous, cellular structure. The background shows more coral and a few small fish swimming in the clear, blue water.

Lyme Bay Reefs

*Report on four Seasearch
dives 27 & 28 June 2015*

Compiled by Nick Owen

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Funding from the Dorset Wildlife Trust is acknowledged through



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Introduction

This Seasearch survey was carried out with the support of Dorset Wildlife Trust (DWT) by seven volunteer divers on the chartered hardboat Blue Turtle based in Lyme Regis. The aim of the survey was to look at undived features from the DORIS multibeam sonar survey in and adjacent to the Closed Area with a primary emphasis on increasing the spread of Seasearch records. The DORIS map can be seen at <http://www.dorsetwildlifetrust.org.uk/doris.html>

Diving practice

All divers on the trip were volunteers, had been Seasearch trained and were familiar with Lyme Bay diving in circa 25 metre depths. Four dives were carried out over the two days in conditions of underwater visibility ranging from four to eight metres. On each site except Plan B Reef, the centre of the site was shotted and buddy pairs volunteered for a direction in which to head whilst recording. A Seasearch Surveyor form was completed for each site using descriptions and species records from each diver/buddy pair. All divers took photographs, many of which have been made available in the form compilation process. The data on the forms and in this report are presented in good faith with the aim that an accurate picture of seabed topography and biota should be achieved.

Diving conditions

Weather on the weekend was choppy and changeable with winds from a generally southwesterly direction. Changeability and poor prognosis in the weather forecast in the week leading up to the survey cast considerable uncertainty over whether the trip would run and in the event, poor weather ruled out visiting Chesil Beach and Stennis Ledges Marine Nature Conservation Zone (designated November 2013) due to the long and exhausting return journey to Lyme into the wind and chop. Conditions for the last dive were bumpy enough that the rise and fall on the sounder were greater than the seabed topography on the original target. The more pronounced rise of "Plan B Reef" just to the northeast was therefore chosen.

Target selection

The following considerations played a part:

- Natural substrate showing contrast to the surrounding seabed in terms of elevation and apparent structure.
- Capable of being related back to DORIS from sounder.
- No previous Seasearch data.

Divers

Richard Yorke (RY), Polly Whyte (PW), Chris Webb (CW), Nigel Topham (NT), Nick Owen (NJO), Carol Horne (CH), Matt Doggett (MD).

Summary descriptions of dive sites.

Seabed and habitat descriptions are taken from Seasearch Surveyor forms lodged with Dorset Wildlife Trust. All site names are arbitrary and serve only to distinguish between sites. Depths on site diagrams given as Metres Below Sea Level (BSL) and positions are of the shot.

1) The Molehill

Date 150627a

Position 50 41.129 -02 47.605 WGS84

DORIS indicates a small (around 70m across), discrete, roughly circular feature apparently composed of a nest of low rock ridges. The feature rises to 18.4m Below Chart Datum (BCD) from an apparently flat sediment seabed at around 21m BCD.



Figure 1 DORIS plot of the Molehill (yellow arrow) and Plan B Reef (red arrow)

Seabed description

Seabed proved to bedrock (possibly sandstone) in low ridges and slabs with slabby boulders and gently sloping from the crown at 18.4m BCD to 21m BCD (image 2). The bedrock was heavily piddock-bored, fractured and supported a diverse bryozoan/hydroid-dominated tall animal turf with encrusting bryozoans, anthozoa, sponges and tunicates. Occasional red algae were noted. Silt of various thickness was recorded on all surfaces, accumulating in hollows plus patches of shell gravel. Occasional small patches of soft rock (shale/mudstone/stiff blue clay) and sand were recorded but these were minor components of the substrate and not surveyed separately.

Rocellaria (formerly *Gastrochaena*) *dubia* was very common with its twinned siphons projecting through the silt. Fractured faces (especially in the rare shale exposures) show that larger piddocks are present.

Large numbers of the sea fan *Eunicella verrucosa* were present in all sizes and including white colonies. One colony showing erosion of tissue at base (NJO), some prone, alive. The nudibranch *Tritonia nilsodhneri* normally only found on its prey *Eunicella verrucosa* was abundant, with eggs. Several *T. nilsodhneri* photographed on open sea bed (e.g. image 3). Angling debris seen (monofilament tangled in a *Eunicella verrucosa*).

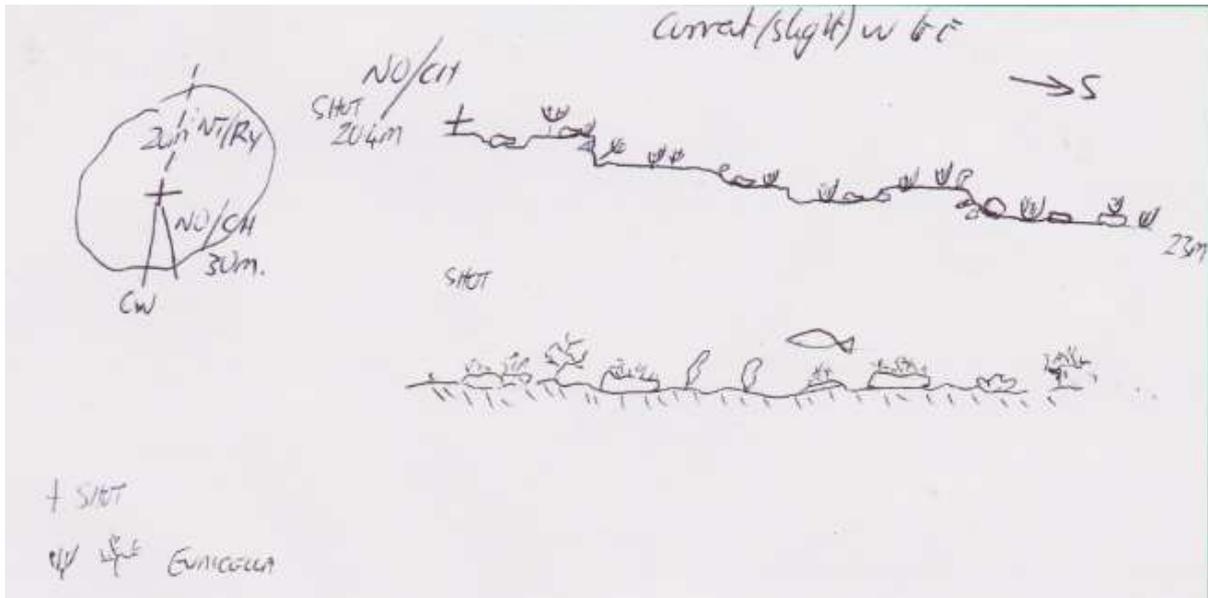


Figure 2 Diagrams of the Molehill. All depths BSL.

2) “Bouldery Bits”

Date 150627p

Position 50 41.768 -02 48.255 WGS84

DORIS shows three patches of apparently large, uniform boulders, these patches in a line running E-W. Central patch, a triangular area with an apparent scarp to the south rising to 17.4m BCD) and dipping northwards into flat sediment at around 19.4m BCD.

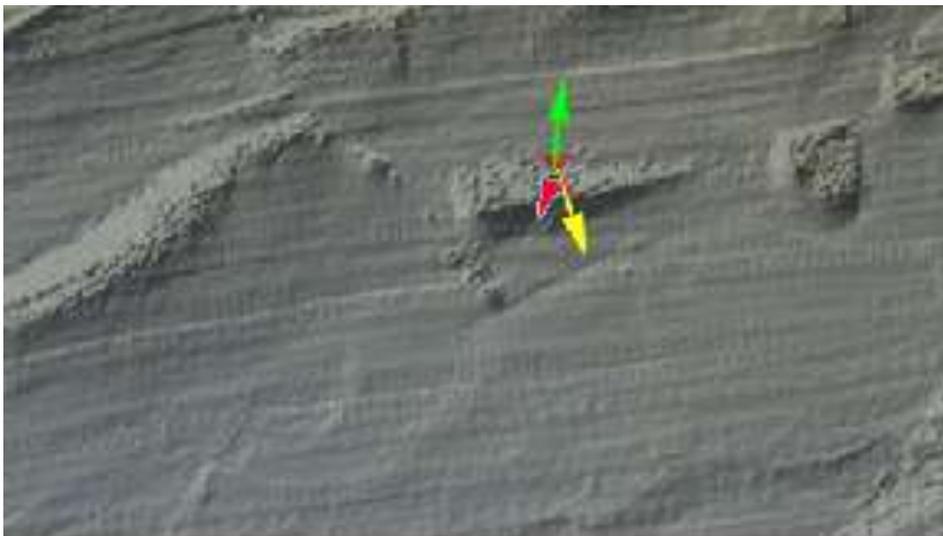


Figure 3 DORIS plot of Bouldery Bits – Green arrow; RY/NT, Red; CW, Yellow; NJO/CH

Seabed description

Sloping bedrock ledge fractured into sections and ledges.

CW (southwest) recorded a bedrock ledge with circular layer stacks (“tors”) in places dominated by varied bryozoans with some sponges. Frequent *Eunicella verrucosa* including juveniles.

NJO/CH (south southeast) recorded a ledge of silty, shallowly-dipping bedrock eroded into slabby boulders covered by a varied bryozoan-dominated turf with sponges. The bedrock became more broken and the resulting slabs became more separated towards the south-southeast with occasional outcrops of soft, piddock-bored shale/blue clay. The site slopes gently to the south onto firm silty sand with shell gravel and animal burrows and *Pecten*

maximus, chert pebbles (both above and below surface) and animal burrows (image 5). Bedrock suspected to dip away below sediment as there is a transition zone (image 6) with boulders (NJO). The Sediment was treated as a second habitat but not surveyed in detail due to lack of dive time. *Eunicella verrucosa* was scattered throughout the dive, including juveniles. Monofilament line was recorded on one *E. verrucosa* and one 20mm shell case (spent munition).

RY/NT (north) recorded bedrock covered with fine sand/silt, small reefs up to 1m high with some patches of deep mud/silt/fine sand. There was one noticeable patch with numerous *Turritella communis* and unidentified broken shells.

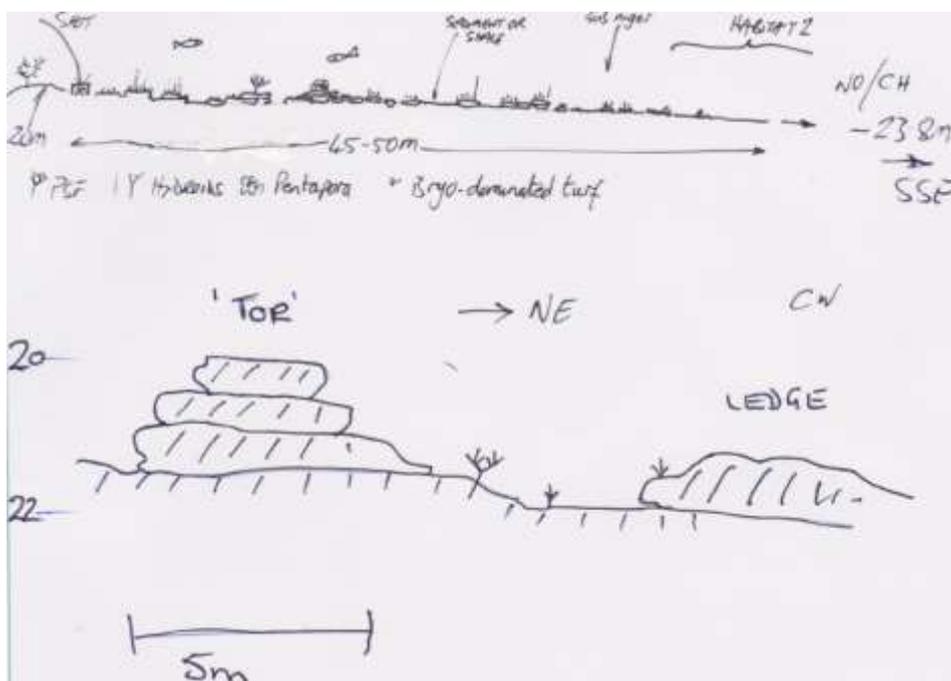


Figure 4 Diagrams of dive site “Bouldery Bits”

3) The Eye

Date: 150628a

Position (shot) 50 39.482N 2 39.901W WGS84.

The DORIS plot shows an elliptical formation measuring approximately 80m X 40m with the long axis running roughly east to west with apparent concentric ridges around a flat central area. The whole structure rises a few metres from a surrounding area of apparently flat sea bed. The shot was placed in the centre of the site in 20.8m BCD and dive pairs swam as follows: NJO/CH east, MD/PW south, RY/NT north.



Figure 5 DORIS plot of The Eye

Seabed description

Bedrock reef in the form of an east to west-running ellipse of low, silty rock slabs/ledges around a central area of bedrock covered in silt, shell fragments (to at least finger depth in places) with boulders, cobbles and occasional gravel.

Central area: Animal burrows in sediment with the fish *Pomatoschistus pictus*, *Callionymus reticulatus*, as well as necklace shell (*Euspira catena*) egg masses. A greater diversity of life was apparent on rocks which supported silty short animal turf (SAT) of tunicates, branching bryozoans, hydroids, anthozoa and sponges. *Eunicella* skeletons (rare) were observed lying flat to the sea bed.

The outer ridge of bedrock rose to 19m BCD, was horizontally-bedded and broken into slabs and boulders (image 10) with rich, diverse tall animal turf (TAT) dominated by branching bryozoans including *Chartella papyracea*, hydroids and sponge cushions with sponge crusts, bryozoan crusts, occasional tunicates and anthozoa. NJO/CH saw good numbers of bib and poor cod.

NT & RY went north across the short axis of the formation and reported silt-covered bedrock to north of the outer bedrock/boulder slope which ended at 20.4m BCD. Note that NT/RY chose to finish their dive on the outer boulder slope noting: "The variety of species and quantities (a wonderful dive site!)" and: "The only (other) place in this area where I remember diving with so many fish throughout the dive is on the Baygitano, which I believe is noted for its fish life." This pair recorded some overhangs in outer faces of the reef.

Other notes: *Eunicella verrucosa* (rare) on outer reef. Large numbers of squid eggs (NT). No apparent human impact.

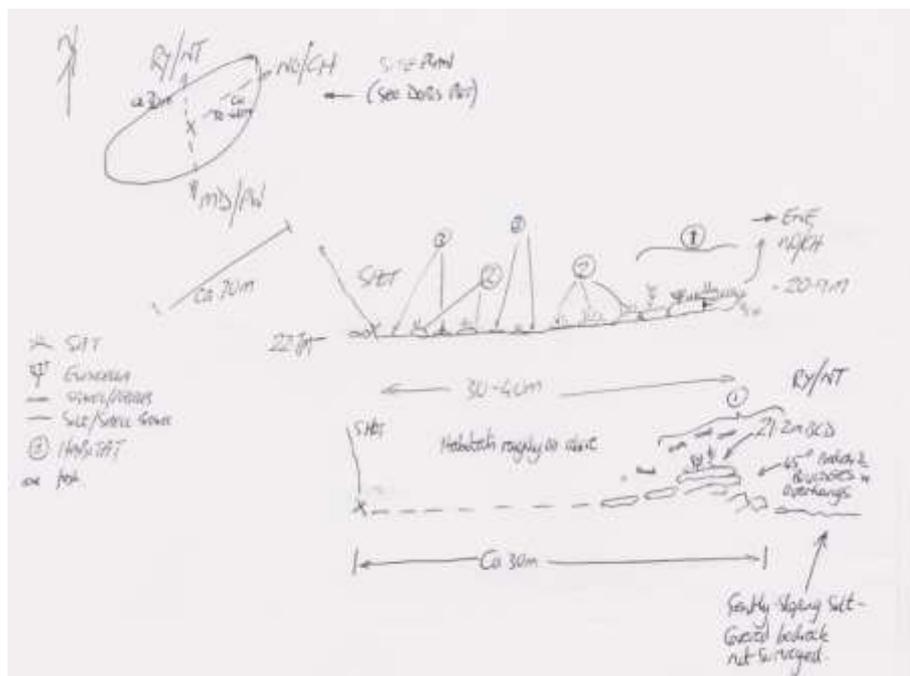


Figure 6 Diagrams, The Eye

4) Plan B Reef

Date: 150628p

Position 50 41.213N 02 47.109W WGS84.

See figure 1 for DORIS plot which shows an area of reef running approximately north-northeast to south-southwest, rising from a seabed apparently composed of sediment.

Seabed description

The divers found a reef of silty, piddock-bored bedrock with strong horizontal bedding which had collapsed due to piddock boring of underlying softer strata. The harder surface stratum was eroded into slabs and showed low ledges sometimes with undercuts. Slabby boulders were also present, apparently eroded out of the reef. Pockets of sediment were present on the rock, mostly shell fragments mixed with silt and usually shallow. Occasional patches of softer shale/mudstone were visible between boulders and under overhangs. The bedrock supported a rich and diverse TAT of *Eunicella verrucosa*, sponges, branching bryozoans and hydroids with tunicates (including *Phallusia mamillata*) and anemones plus occasional foliose and filamentous red algae, all with a coating of silt.

Notable records:

- *Adreus fascicularis* (nationally scarce branching sponge, rare here).
- *Eunicella verrucosa* (common) including rare white version, some dead and horizontal, some dying and horizontal, most healthy.
- The sea fan nudibranch *Tritonia nilsohdneri* was occasional on *E. verrucosa* and again (unusually) found on open ground (picture available NJO).
- The anemone *Aiptasia mutabilis* was frequent including a rare white form (picture available NJO).

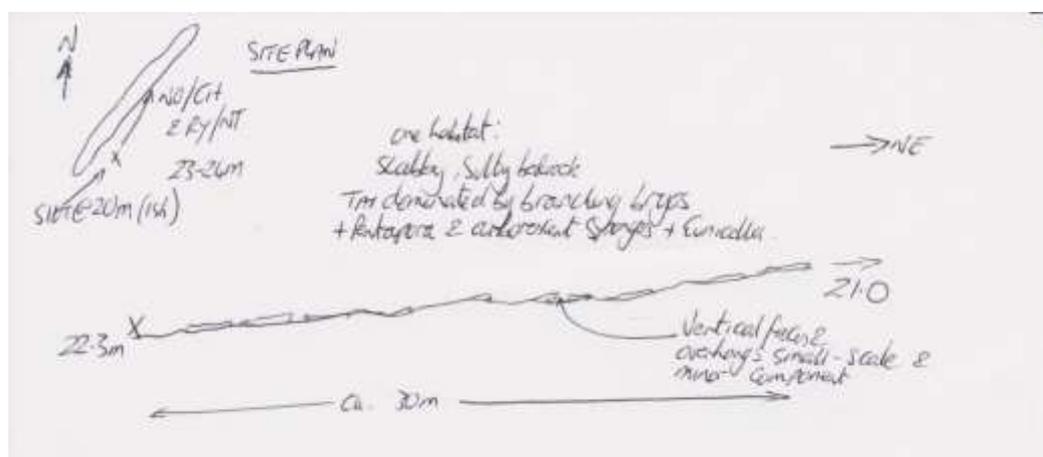


Figure 7 Diagram, Plan B Reef

Summary of findings

All sites dived were reefs, selected on the basis of contrast to the surrounding seabed in terms of elevation and apparent structure. All appeared to be composed of slabs of sedimentary rock eroded in situ from horizontal or near-horizontal strata with collapse downwards caused by faster erosion of less-resistant underlying strata exacerbated by piddock boring (image 2). This is apparent on site 2 "Bouldery Bits" where the gently-dipping uppermost stratum/strata had apparently collapsed downwards, maintaining its/their dip but fractured sections separating into slabby boulders apparent in the DORIS scan (Image 5).

Silt. Although none of the sites dived in June 2014 (Owen, 2014) were re-surveyed, the overall impression was that “saltiness” was less pronounced than in 2014 but that it was greater than previously thought typical of Lyme Bay diving.

The recorded incidence of **erosion damage** to the bases of *Eunicella verrucosa* colonies was less than that noted in June 2014 leading to the inference that either these particular sites had received less erosion by movement of coarser sediment across the substrate during winter 2014/15 (compared to winter 2013/14) or that damage to the soft tissue of colony bases incurred in 2013/14 (Owen, Bolton) had been repaired.

Site condition/biodiversity.

All sites were in apparently good condition with diverse animal turf including tall, long-lived species (*Eunicella verrucosa*, *Adreus fascicularis* and the potato crisp bryozoan *Pentapora foliacea*) indicating no or low levels of recent mechanical disturbance or damage to substrates. Man-made debris was rare and was mostly monofilament line fouling *Eunicella verrucosa*. Red algae were recorded on all sites save the Eye which was the siltiest and further east than the other three.

Notable species and occurrences.

- *Eunicella verrucosa* on all sites, often in large numbers and at all growth stages plus white form (rare) and large numbers of *Tritonia nilsodhneri* and eggs. *T. nilsodhneri* seen on open sea bed away from expected host.
- *Okenia elegans* a sea slug and predator on tunicates (image 4).
- *Aiptasia mutabilis* including a white form.
- *Phallusia mammillata*.
- Large numbers of fish and squid eggs on The Eye.

Species diversity

Site	1 150627a Molehill	2 150627p Bouldery Bits	3 150628a The Eye	4 150628p Plan B Reef
Depth (m, BCD)	18.4 to 20.4	17.4 to 19.4	19 to 21	17 to 19.2
Number of species/biota recorded	85	75	69	70

Note that these numbers are taken from the Seasearch forms and cannot be regarded as exhaustive catalogues of the species present on each site. Other species have since been recorded on photographs taken during the survey, an indication that true species richness of these sites is greater than indicated here.

Acknowledgements

The skill and commitment of the divers should be recognised, as should the generous offer by skipper Rob King of dive boat Blue Turtle to run the trip on a “per diver” basis rather than the full charter cost in the face of poor bookings in the lead-up to the trip.

All DORIS snapshots are taken from the Dorset Wildlife Trust website – see Appendix 1 for acknowledgement.

All Seasearch Surveyor forms from these dives have been lodged with Dorset Wildlife Trust. All image copyrights remain with photographers (as listed) images are used here by permission.

References

Lyme Bay Rocky Reefs, Seasearch report on four dives. Baldock October 2013
Lyme Bay Reefs and Cobbles, Seasearch report on four dives. Owen June 2014
Chesil Beach and Stennis Ledges MCZ Seasearch Site Surveys 2014, DWT/C Bolton
Lyme Bay Rocky Reefs – Seasearch Survey Dives 4th May 2014, DWT/ C Bolton
All these reports are available on DWT (Dorset Wildlife Trust) website (Jan 2016)

Appendix 1

Dived sites 2015 – Locations

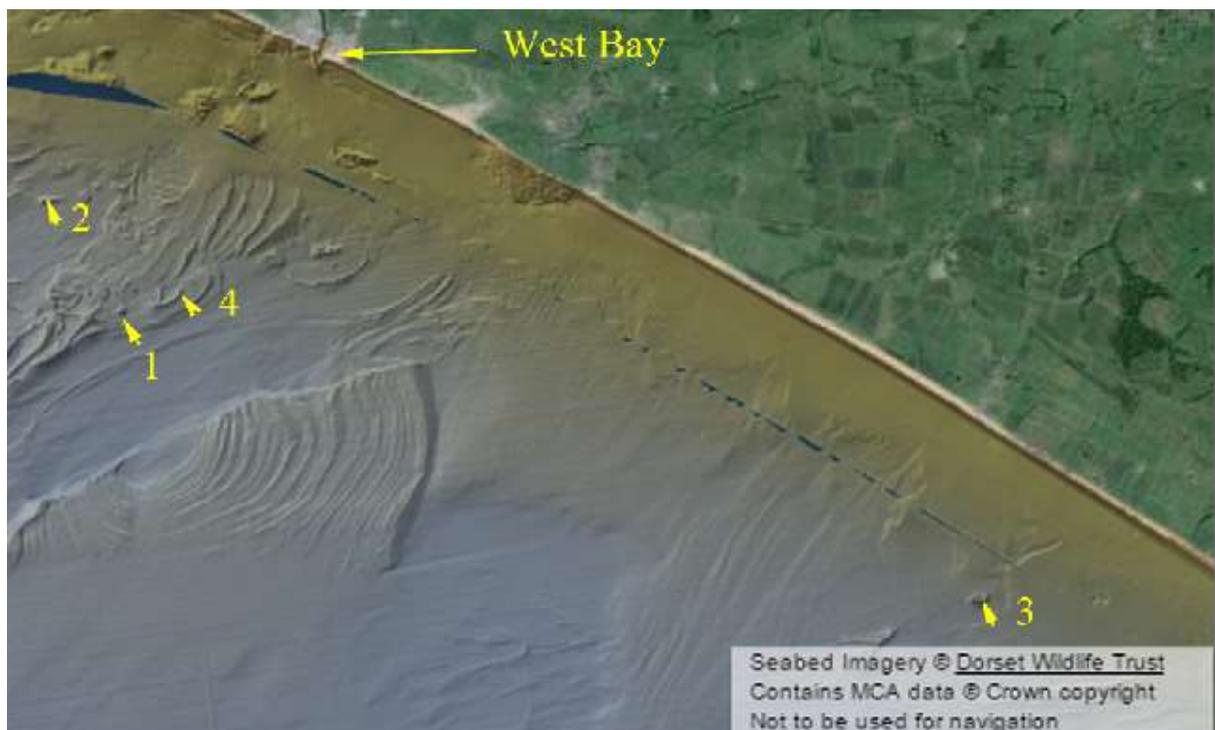


Figure 8

Appendix 2

Images from dives

1) 150627a Molehill



Image 1 Overview of habitat showing bedrock fractured into boulders covered in dense animal turf with sponges, hydroids, soft corals and bryozoans.

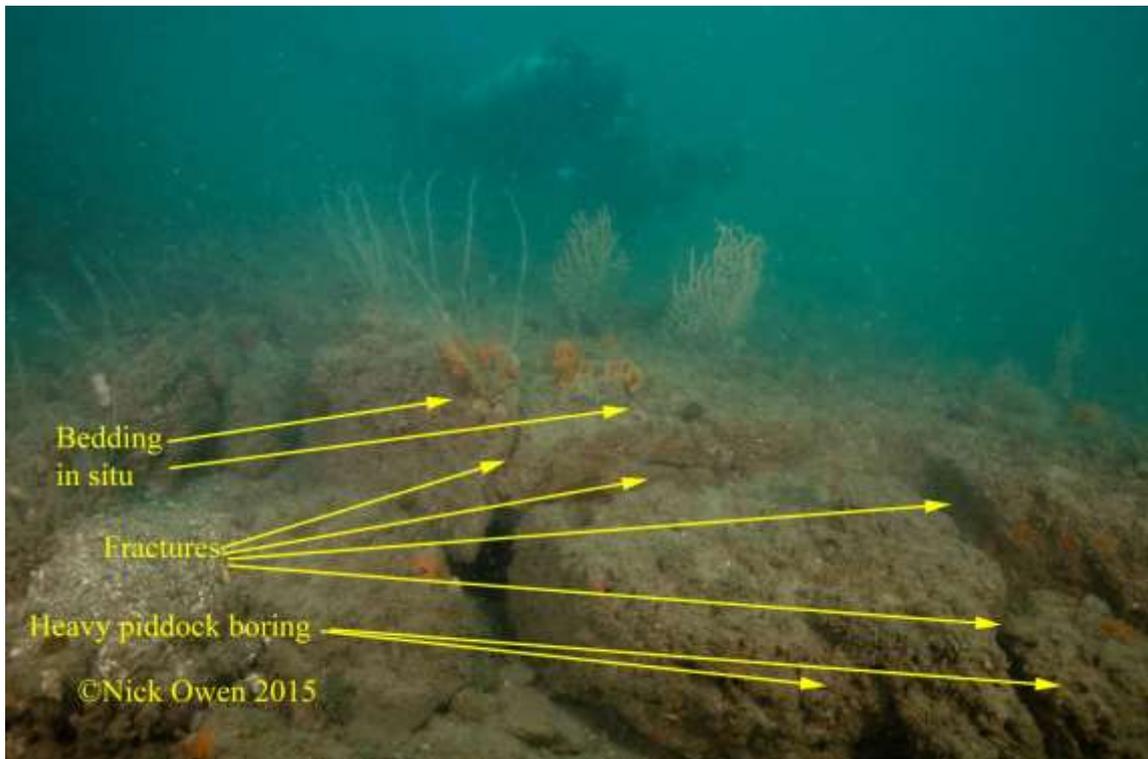


Image 2 Geology of the Molehill



Image 3 Tall animal turf on silty rock. Three *Tritonia nilsodhneri* (a nudibranch, indicated here by red arrows) on sea bed away from their host the pink sea fan *Eunicella verrucosa*.



Image 4 The nudibranch *Okenia elegans* feeding on a tunicate with only its gills showing ©Richard Yorke 2015

2) 140627p Bouldery Bits



Image 5 Habitat 1 silty bedrock slabs with animal turf



Image 6 Transition from reef to sediment showing boulders leading back to reef in background



Image 7 Habitat 2 (sediment with burrows) looking south

3) 150628a The Eye



Image 8 Shot drag indicating depth of sediment



Image 9 Central area silty bedrock. Note large areas of phoronids growing through silt (inserted image is a zoom of same view)

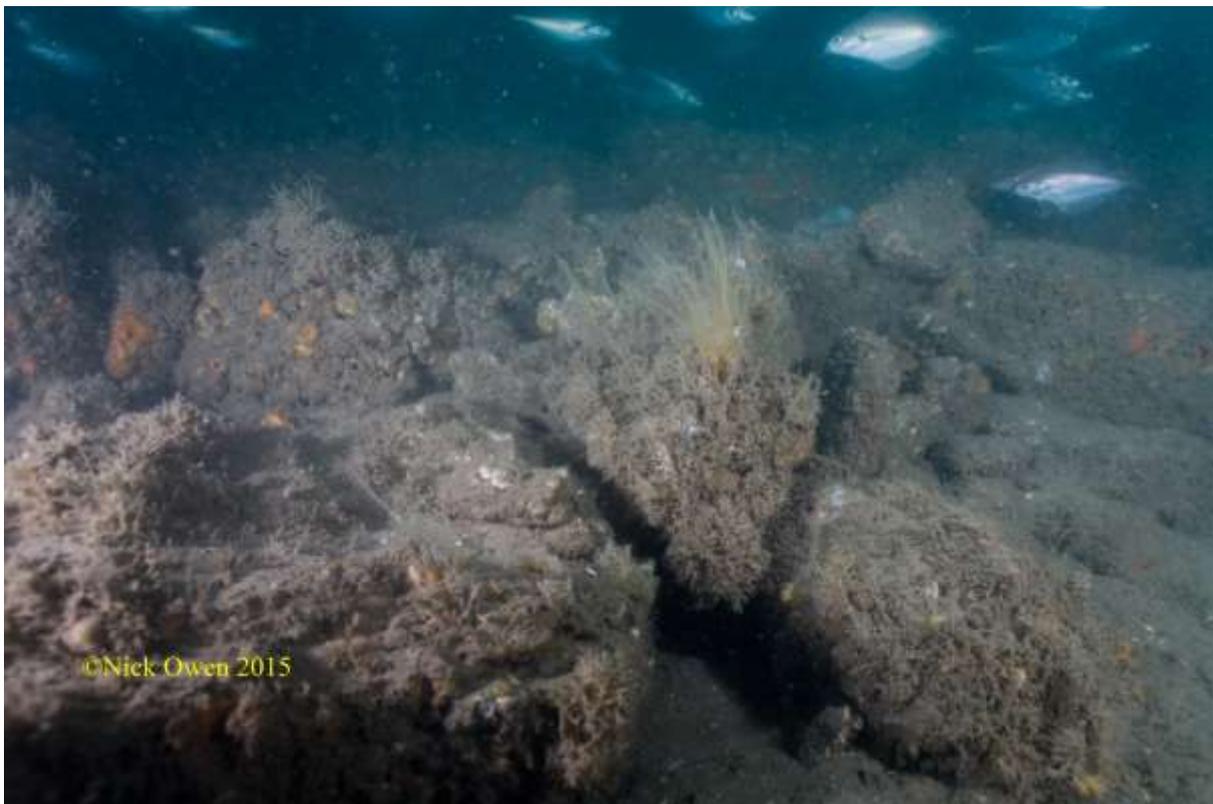


Image 10 Outer reef bedrock and boulders with diverse animal turf and abundant fish (mostly bib with some poor cod).



Image 11 Turf on upward-facing rock showing *Nemertesia ramosa*, solitary squirts and the colonial squirt *Pycnoclavella aurilucens* (white and yellow forms). © Richard Yorke 2015

4) 150728p Plan B Reef



Image 12 Silty bedrock with animal turf and *Adreus fascicularis*

Front cover “miniature swim-through” seen at Plan B Reef showing dense and diverse animal turf with rare red algae