

Persistence of seabed scars from large vessel anchoring in Weymouth Bay and Poole Bay



Dorset
Wildlife Trust



A report by Dorset Wildlife Trust

Persistence of seabed scars from large vessel anchoring in Weymouth Bay and Poole Bay

Peter Tinsley

A report by Dorset Wildlife Trust

This report has been produced by Dorset Wildlife Trust using acoustic data from survey work funded by Natural England. Views expressed in this report are not necessarily those of Natural England

Persistence of seabed scars from large vessel anchoring in Weymouth Bay and Poole Bay

From spring 2020, a number of cruise ships lay at anchor along the south coast, particularly at Torbay, Weymouth Bay and Poole Bay, having been taken out of service because of the Covid-19 pandemic. This continued until the summer of 2021.

Concerned about possible impact on seabed habitats, in January 2021 Natural England and Dorset Wildlife Trust commissioned 4 blocks of multibeam survey in Weymouth Bay and 1 block of sidescan survey in Poole Bay. These surveys revealed extensive seabed scarring (Tinsley, 2021). In February 2022, two of these blocks – one in Weymouth Bay, one in Poole Bay, were re-surveyed, using multibeam sonar.

Weymouth Bay anchorage

The multibeam survey of sections of Weymouth Bay in Jan 2021 revealed extensive scarring in the seabed sediment from the anchors and chains of out-of-service cruise ships (Tinsley, 2021).

One 1km square was re-surveyed in Feb 2022. Figure 1 shows that the earlier scars are still highly visible, and a number of new scars are apparent. There are also some fainter marks, barely visible in the bathymetry, but showing better in the backscatter. An example is the smooth arc, 20m across and no more than 20cm deep that is visible at the very bottom of the square. This is most likely a trawl scar.

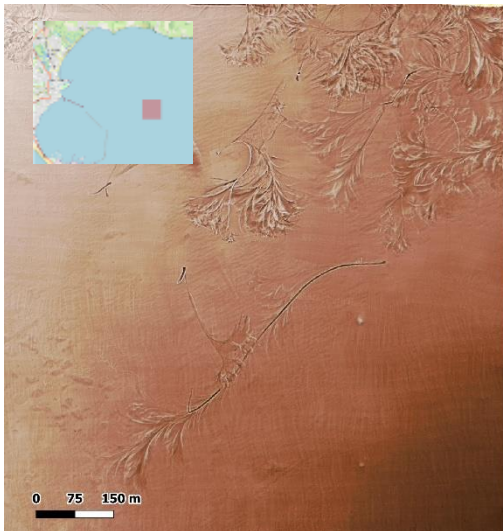


Figure 1 Seabed bathymetric model 2021 from Weymouth Bay, showing extent of anchor and chain scarring

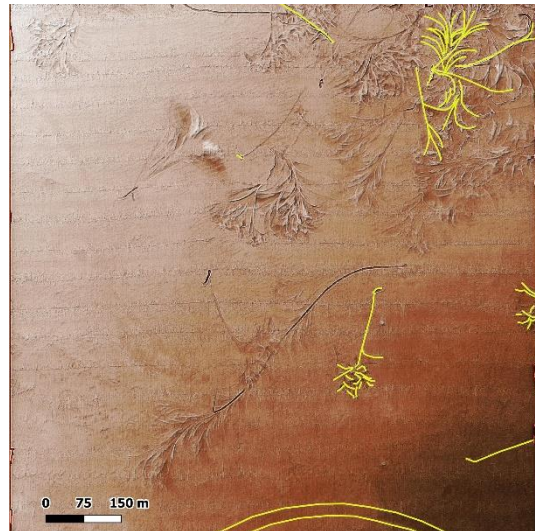


Figure 2 Seabed bathymetric model 2022 showing extent of anchor and chain scarring. New scars outlined in yellow.

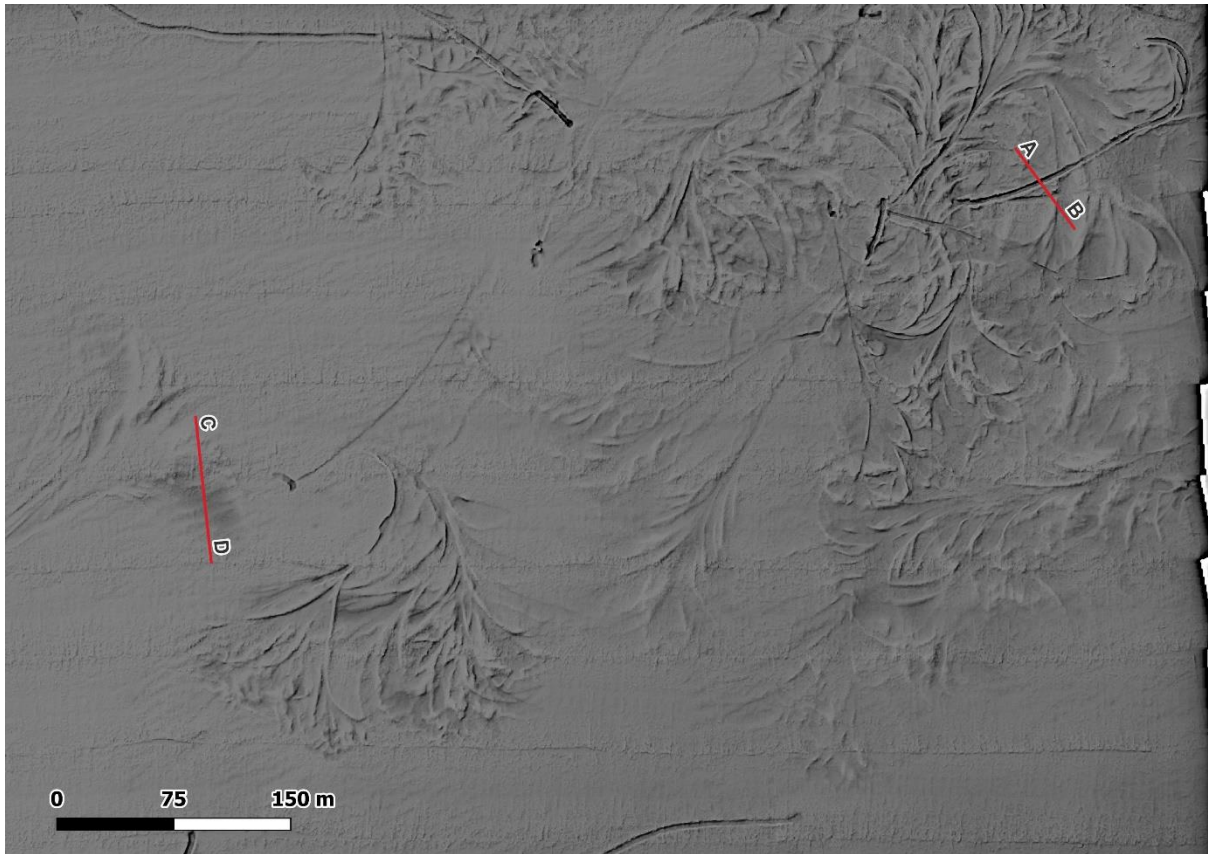


Figure 3 Composite bathymetry and backscatter image from 2022 survey showing profile lines AB and CD

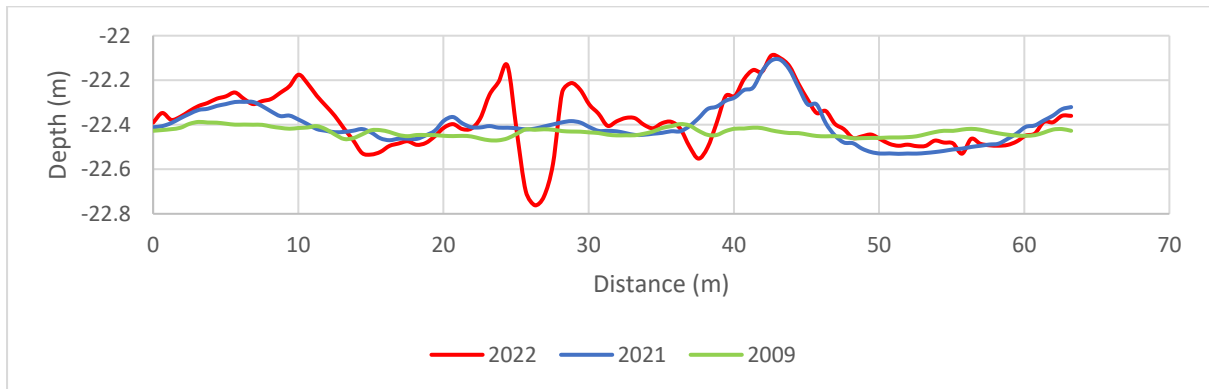


Figure 4 Profile across line AB showing new scar approx. 26m along the line. Red line – 2022, Blue line 2021, Green line 2009

Figure 4 shows a close match between the 2022 and 2021 profiles, with a new scar in the 2022 line at around 26m from A

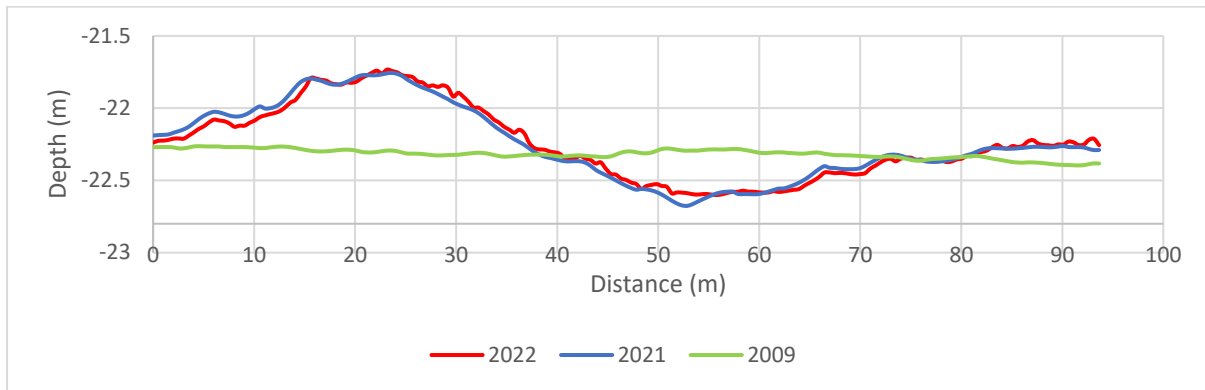


Figure 5 Seabed profile along line CD Red = 2022, Blue = 2021, Green = 2009.

Figure 5 shows almost no change in the seabed profile between 2021 and 2022. The mound and associated depression caused by the chain on a double anchored ship shows no sign of flattening out over a 12-month period. The actual age of this scar is not known.

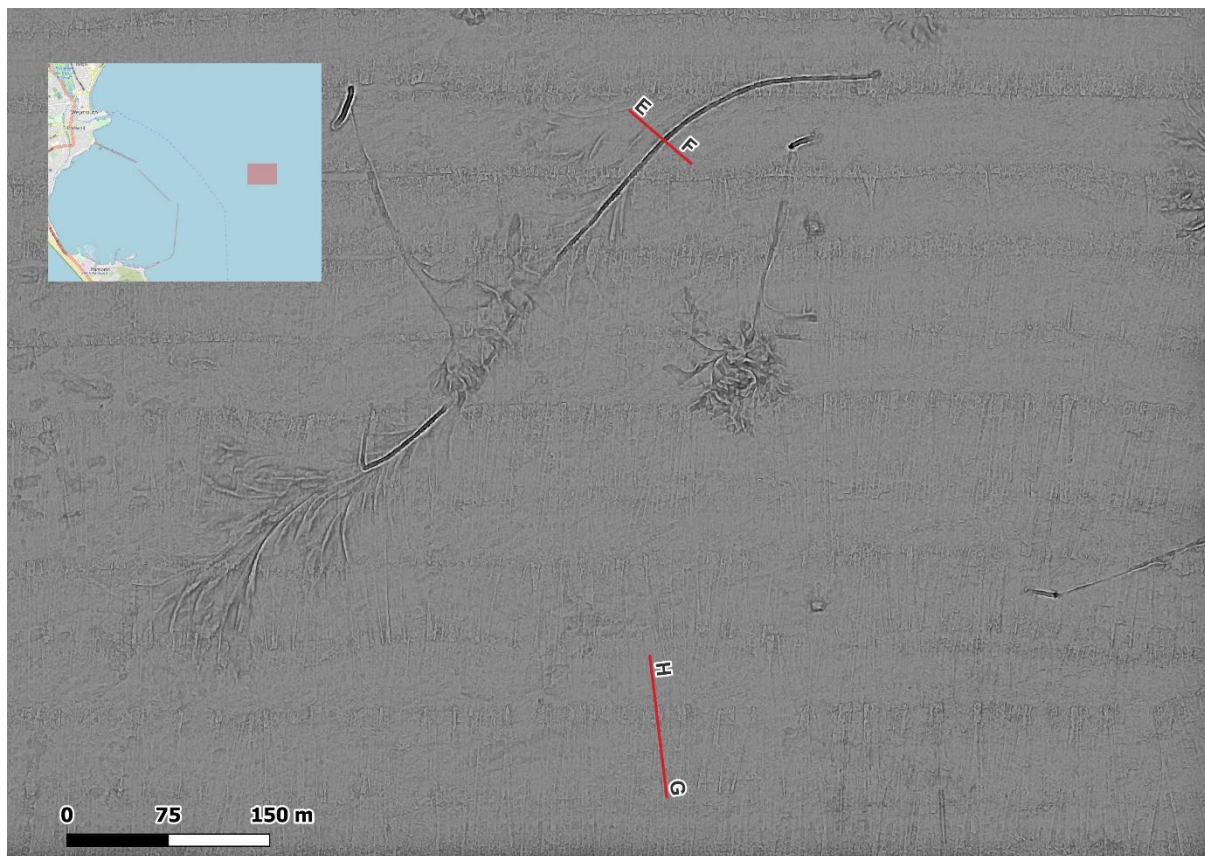


Figure 6 Composite bathymetry and backscatter image from 2022 survey, showing profiles EF and GH. Location of image is shown in map inset.

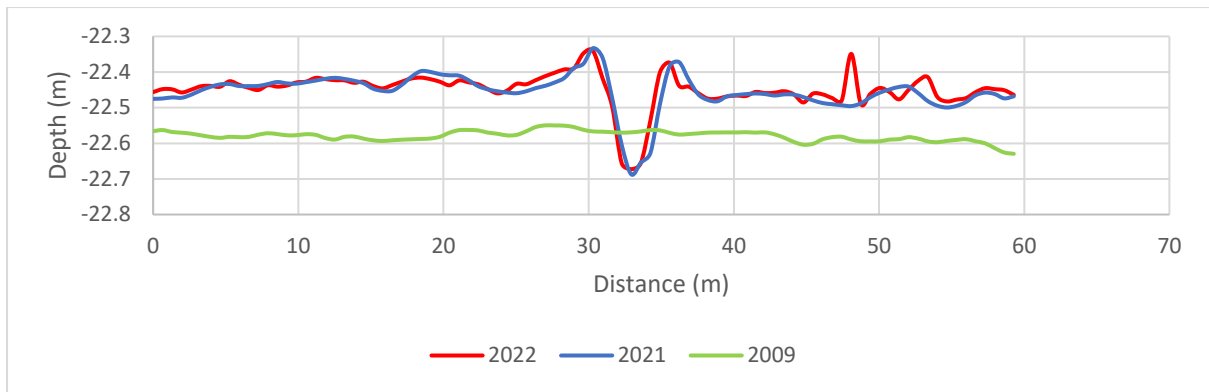


Figure 7 Seabed profile along line EF Red = 2022, Blue = 2021, Green = 2009.

Profile EF runs across a trench approx. 5m across and 0.5m deep, consistent with a large anchor dragging across the seabed. The profiles suggest a slight filling in of the trench and lowering of the banks in the 12 months between the two surveys.

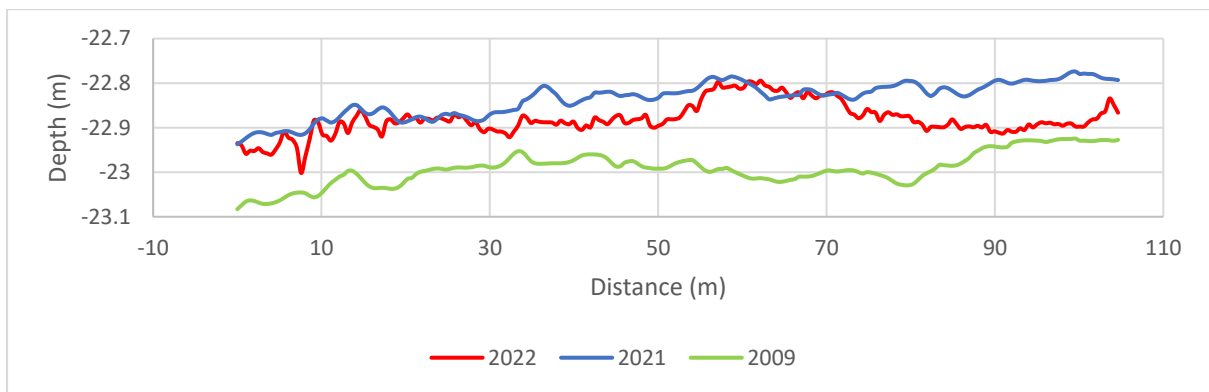


Figure 8 Seabed profile along line GH Red = 2022, Blue = 2021, Green = 2009.

Profile GH runs across a faint 20m broad feature arcing across the southern section of the survey block. This is just discernible in the bathymetry data but shows up more clearly in the backscatter. It coincides with a slight flattening of the profile between 30 and 50m from the start of the line (point G). This would be consistent with a trawl scar.

Reports from divers

In April 2021 divers visited a scar in Weymouth Bay caused by a ship anchoring overnight during calm weather (figure 10). They reported a trench 50m+ long and 1m deep (Knott, pers. comm.) There are piles of what appear to be *Turritella* shells in the mud banks either side of the trench. The trench is thought to be caused by the chain settling into the mud under its own weight.



Figure 9 Diver in trench caused by an anchor chain in Weymouth Bay. Image © Simon Brown

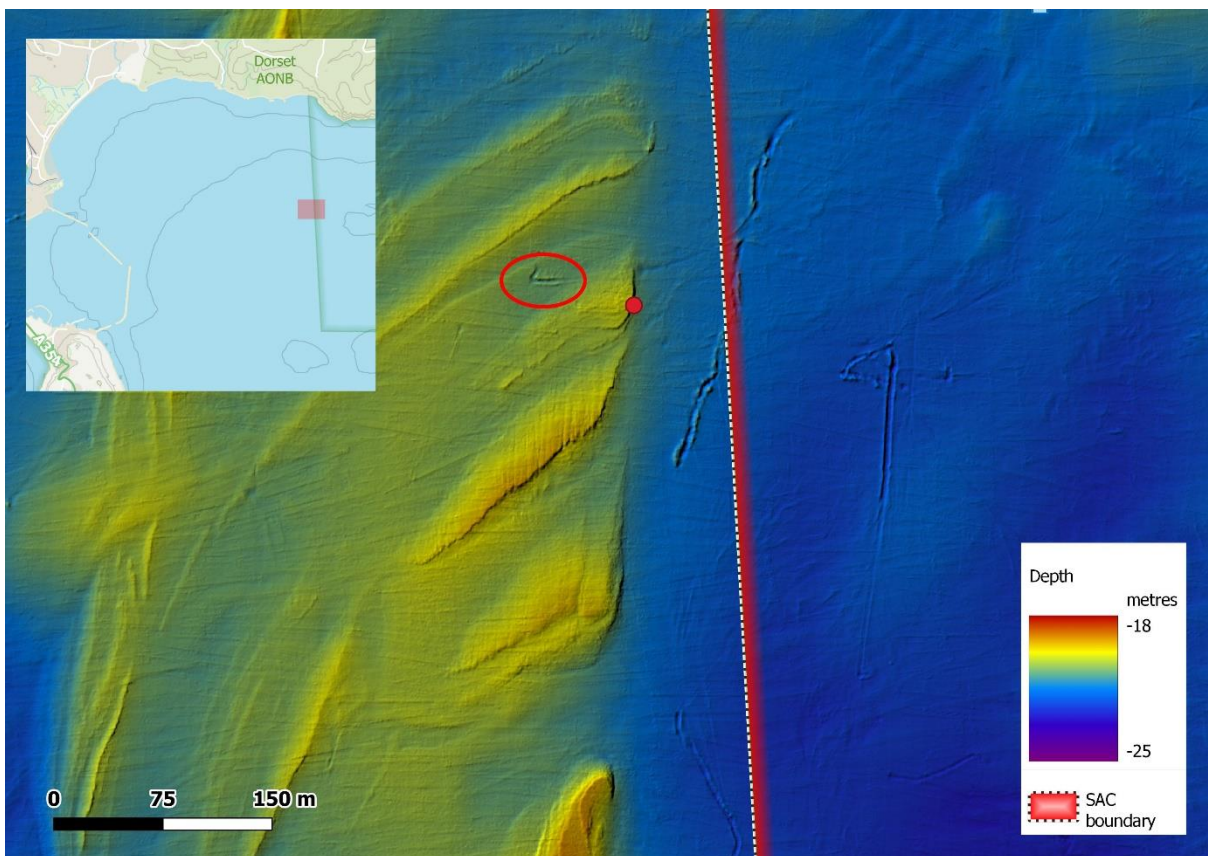


Figure 10 Scar investigated by Seasearch divers (circled in red). Inset map shows location.

On 18 May 2021 Seasearch divers investigated an anchor scar to the west of Lulworth Banks, just outside of the boundary of the Studland to Portland /Purbeck Coast MPA. From the multibeam data collected in Jan 2021, this scar is clearly visible in the sediment either side of a section of bedrock reef but does not leave a detectable trace where it crosses the reef. The divers descended at the point marked by the red dot, investigated the reef top then moved on to the section of the scar circled in red (see Figure 10)

The description of the bedrock is as follows:

“Almost level bedrock reef dipping slightly to the NW, with cobble, small boulders and thin veneer of mixed sediment cover; seafans including juveniles and erect sponges; occasional *Aequipecten opercularis* and rare *Pecten maximus*. Bryozoan turf, particularly on the boulders. Two strips across the reef were denuded of much of the life seen elsewhere on the reef, in particular there was a complete absence of seafans and erect sponges.” More details in Appendix 1.

To the west they describe a “spectacular” disturbed area of cobbles and sediment with two ridges of rubble, about 75cm high and approx. 5m apart, with mobile rippled coarse and medium sand between, with almost no visible life in the rubble or in the sand. This is the “tick-shaped” scar visible in Figure 10. Figure 11 shows a small area of the edge of rubble ridge.



Figure 11 Edge of cobble/rubble ridge. Credit - Lin Baldock/Seasearch

This description tallies with the data from the 2021 multibeam survey and is similar to the rubble ridges seen in Poole Bay. It also confirms that the damage from these large anchors is detectable on the reef top where erect and encrusting reef fauna have been scraped off.

Poole Bay

A number of cruise ships anchored in various locations in Poole Bay from spring 2020 until summer 2021. A targeted sidescan sonar survey of a 1 kilometre square area of Poole Bay in January 2021 revealed a 200m long, 5m wide groove in the seabed, caused by the anchor of a large cruise ship (Tinsley, 2021). This scar was alongside a ridge of chalk that runs across Poole Bay, between Old Harry Rocks and the Needles on the Isle of Wight. This ridge is discernible from multibeam data, especially where the strata are near vertical, until it disappears under the Dolphin Sandbank.

A smaller scar was also visible at the southern end of the survey block. Direct measurements of the depth of the scars are not possible from sidescan sonar images. An estimate of the height of an object above the seabed can be made from the length of the shadow but that is beyond the scope of this report.

The dark patches in the bottom right corner of the sidescan image are believed to show *Sabellaria spinulosa* reefs. These reefs were photographed during a 2017 environmental survey (Corallian Energy Ltd, 2017) and appear to be the best examples of this habitat in Dorset. Their full extent is not known.

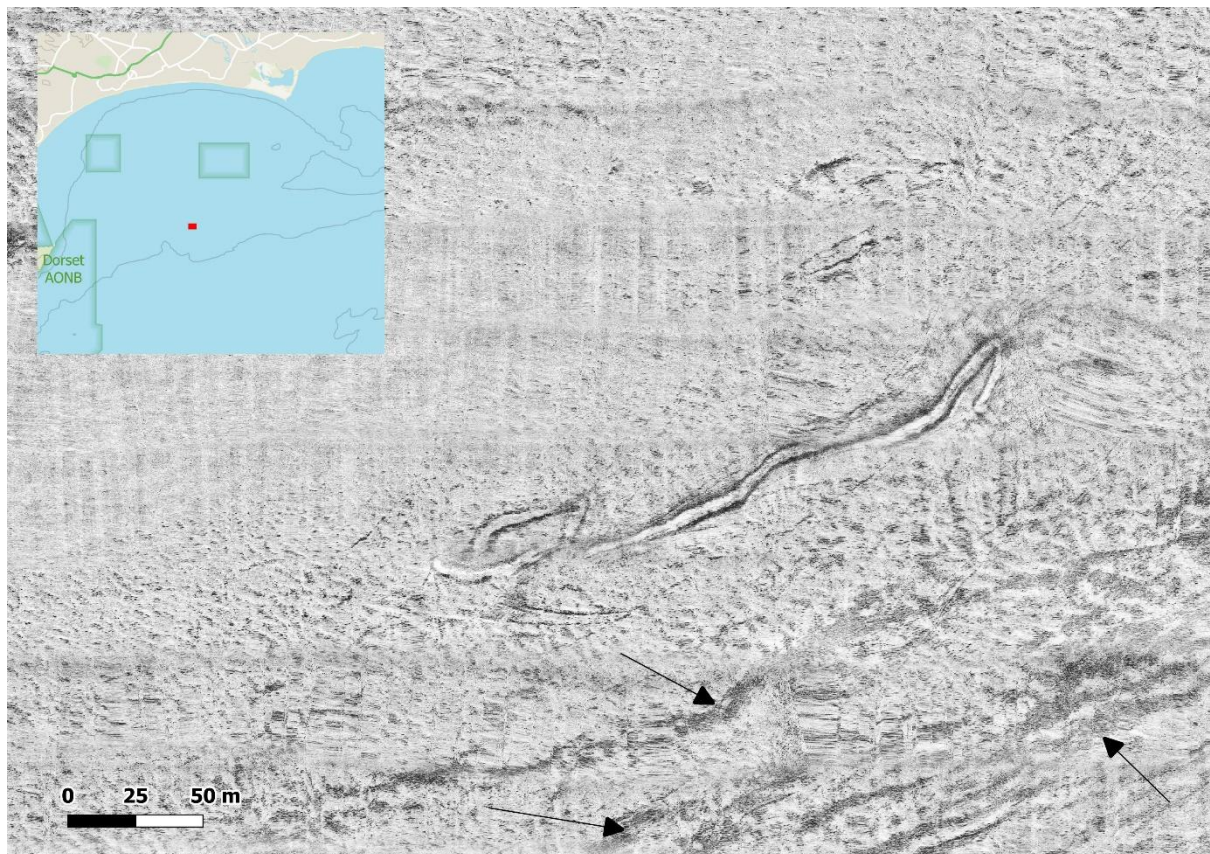


Figure 12 Sidescan image from January 2021 showing seabed scar and likely *Sabellaria* reefs (arrowed). The red box in the inset map shows the overview of the sidescan image.

A team from Bournemouth University dived on a similar scar further to the east in June 2021 – also alongside the chalk ridge, at a depth of 17m. The scar here was similar in size and appearance. A photo-mosaic image (Figure 13) shows a ridge of chalk rubble thrown up either side of the scar. This ridge was measured by the divers as up to 90cm high. The

central trough of the scar is rippled sand. The dark patches at the bottom of Figure 13 are *Sabellaria spinulosa* clumps and the chalk rubble is mostly heavily encrusted with barnacles, though there are large patches of recently broken chalk pieces. Figure 14 shows a photograph of the same trench.

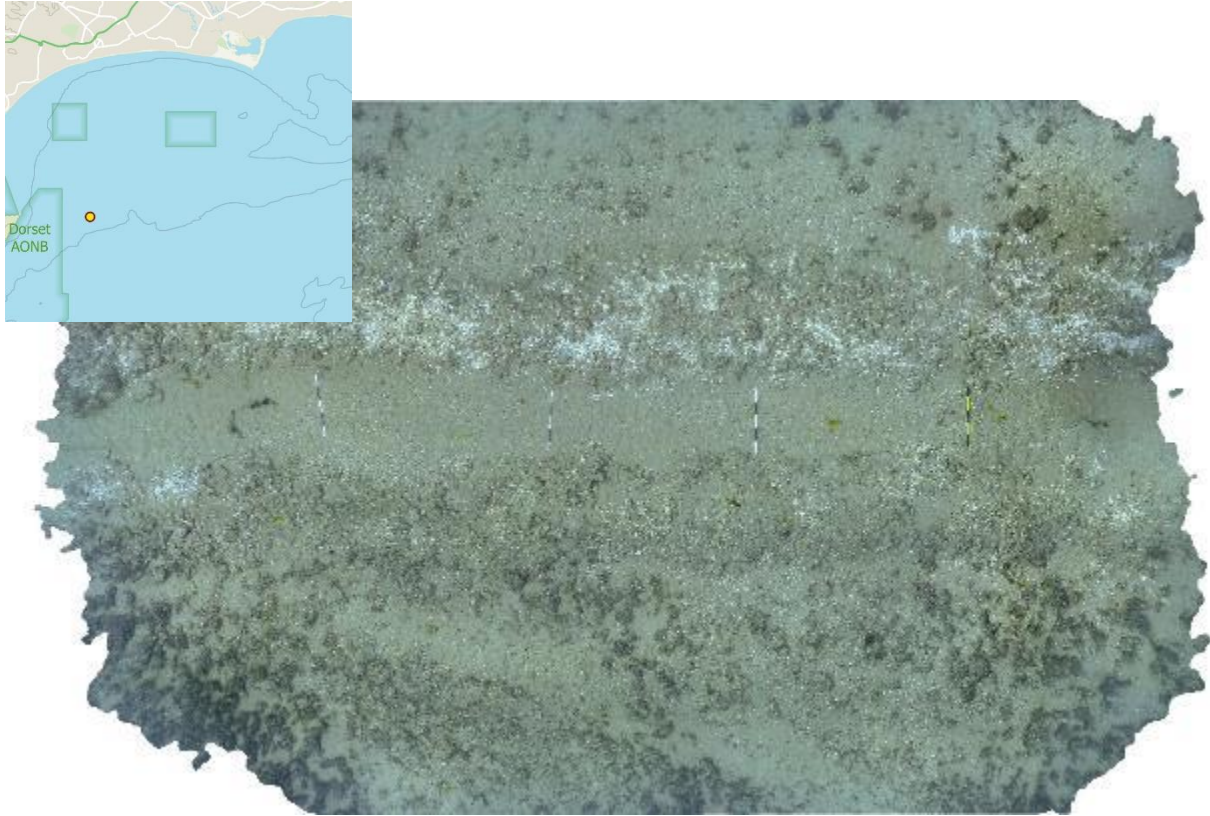


Figure 13 Photomosaic of seabed scar in Poole Bay. Measuring poles are 2.5m long. Location shown in map inset. Credit Bournemouth University



Figure 14 *Photograph of sand-filled trench and chalk rubble banks. Credit Bournemouth University*

These significant structures, with deep piles of rubble on either side, are almost certainly the result of large anchors, 2m or more across, being dragged across the seabed. They match the deep trenches seen in the muddy seabed of Weymouth Bay, where the impressions of the heavy anchor chains are also visible.

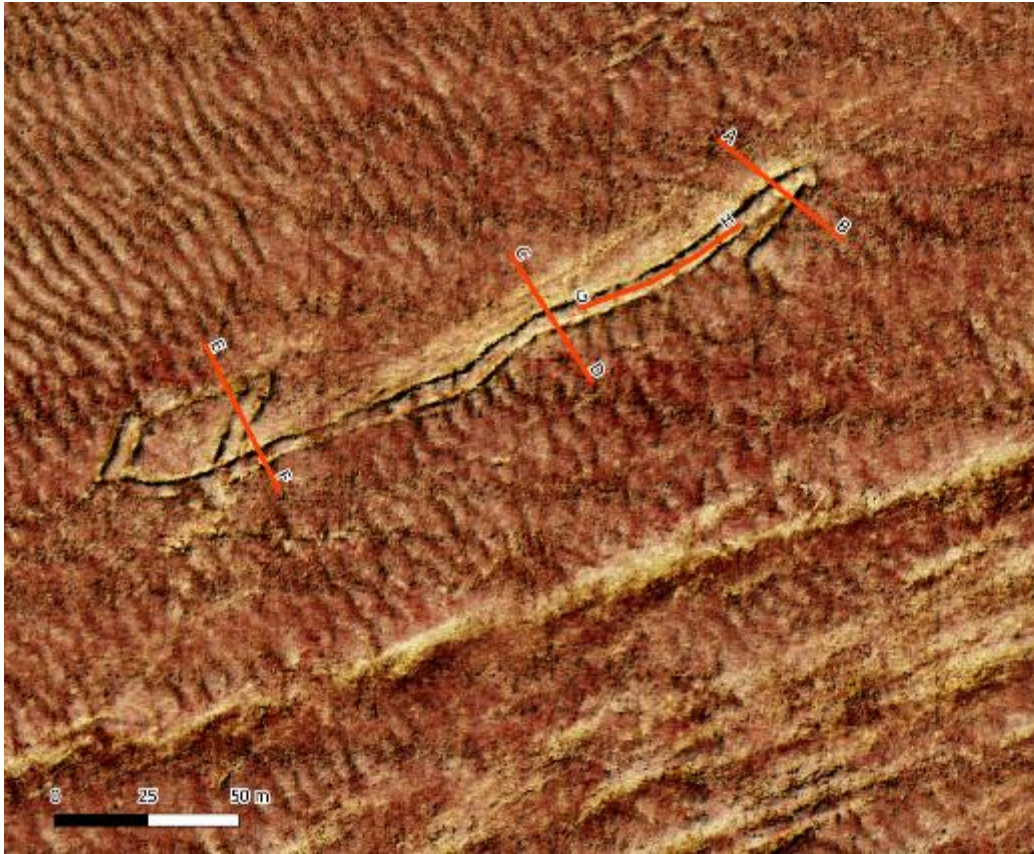


Figure 15 Composite multibeam and backscatter image from February 2022 survey showing seabed scar.

This site was re-surveyed using multibeam in February 2022. Both scars identified in 2021 are still clearly visible, with the banks of rubble standing proud of the seabed. The sandwaves in the surrounding sediment are also visible in the trench between the ridges, suggesting some in-filling, but the profiles show that the depth of the trench is still about 15cm below that of the surrounding seabed and the rubble banks 20cm -30cm higher than the surrounding seabed.

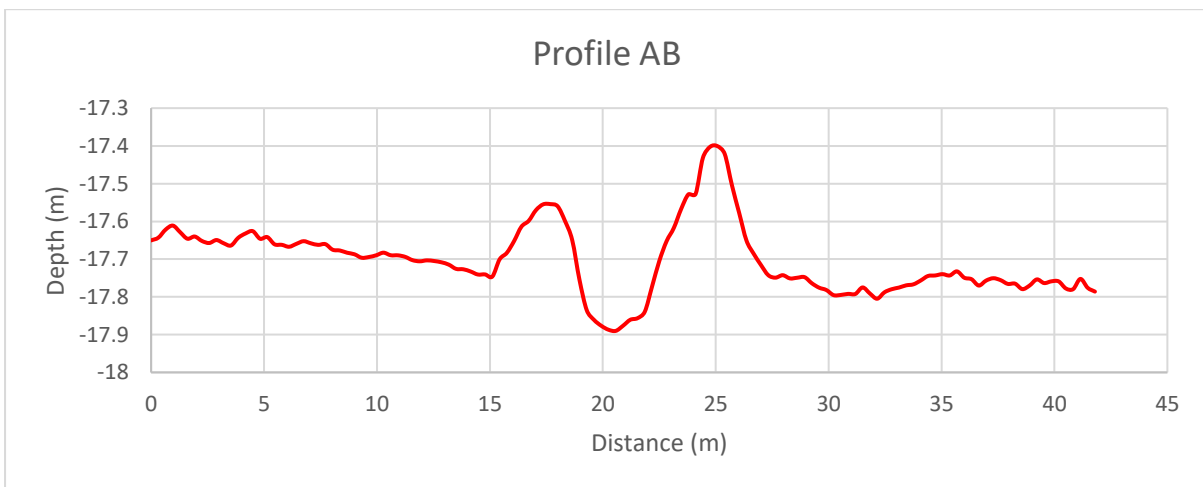


Figure 16 Seabed profile along line AB.

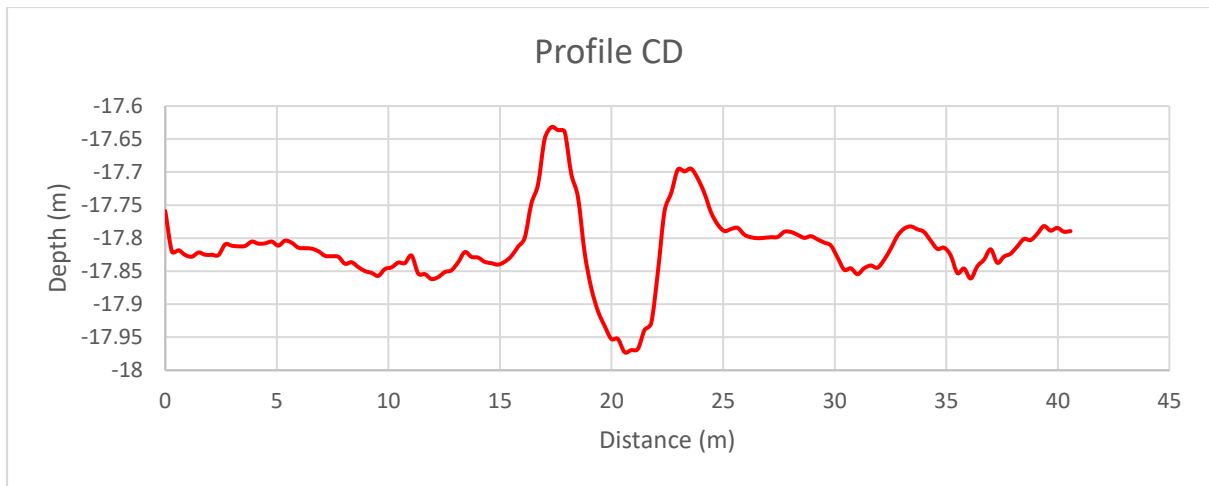


Figure 17 Seabed profile along line CD

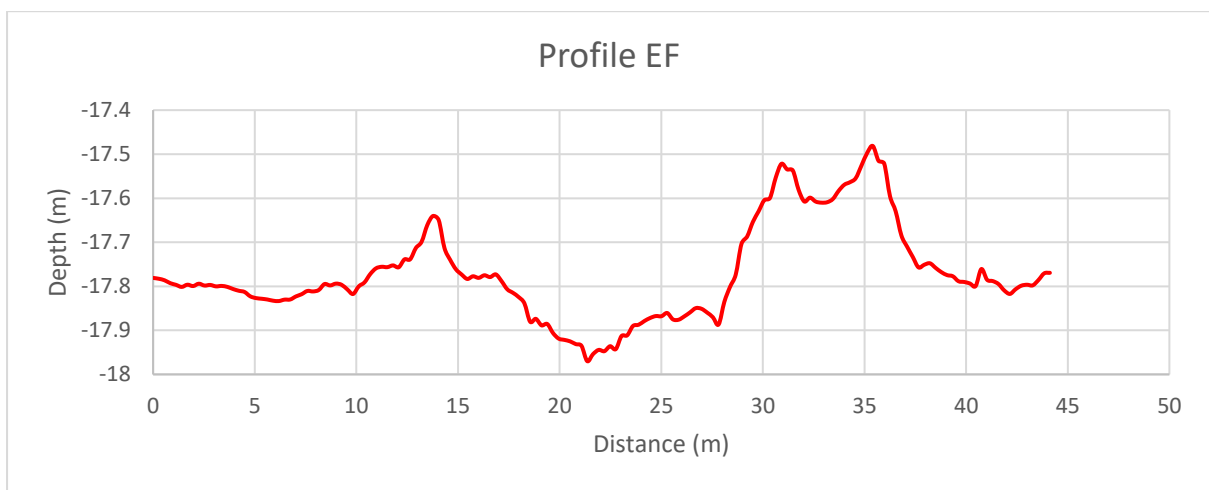


Figure 18 Seabed profile along line EF

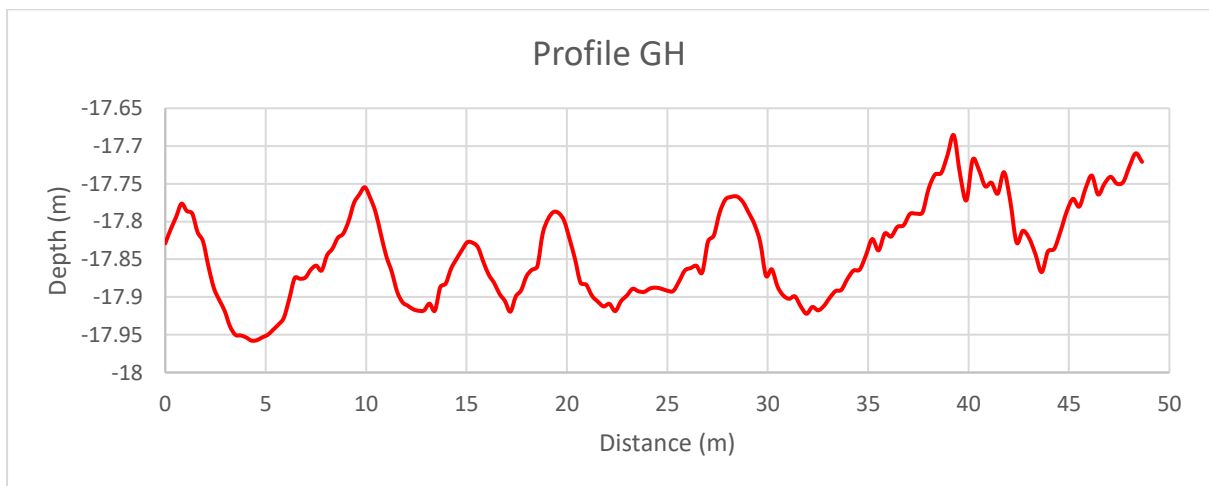


Figure 19 Seabed profile along line GH. This line runs parallel to the tidal currents and the profile shows sandwaves with an wavelength of around 10m. These are not to be confused with the sand ripples seen in the photographs.

Discussions and recommendations

The bathymetric surveys have demonstrated the scale of impact of anchoring of large vessels – far beyond the initial landing of the anchor. The heavy anchor chains drag around on the seabed as the vessel swings with wind and tide and the anchor itself can be dragged along the seabed. There is little sign of the scars flattening out after 12 months. While there are signs that damage has occurred (based on diver observations), there are no before and after surveys we can't say with certainty what the impacts of the anchoring has had

There seem to be three types of impact that have persisted for at least a year. First, the banks and trenches in the soft mud in Weymouth Bay. Although this sediment is soft and easily moved there appears to have been little redistribution of the sediment since the cruise ships departed. This is likely due to sheltered nature of Weymouth Bay. The only images show a barren-looking trench surrounded by mud banks topped with shells – mostly *Turritella*. The 2009 DorIS survey revealed a number of similar, though mostly smaller, marks on the seabed, including some fainter marks which must be older scars that have lost their distinctiveness over time, suggesting that these marks will eventually fade away, but over what timescale is not known. A diver survey of one of these scars would be useful to understand if and how these scars are being re-colonised.

A second impact, so far only visible from diver surveys, is the scraping of epifauna, particularly seafans and erect sponges, from the reef surface. Divers were able to locate the site of impact by following the scars in the sediment either side of the reef. This site should be revisited annually to monitor recovery. It is likely that similar impacts occurred in the Lyme Bay and Torbay reefs SAC following the anchoring of the Marella Discovery and Marella Explorer south of Bridport in February 2021. An attempt could be made to locate the site(s) of impact - using multibeam around the known anchoring location, followed by a diver survey. This site is more exposed than Weymouth Bay so any disturbed sediment may be more easily redistributed, making it harder to locate the site.

The third impact is the creation of banks of rubble, in Weymouth Bay from cobbles and pebbles and in Poole Bay from chalk rubble. These may well turn out to be quite durable features, effectively man-made “stony reefs” and are worthy of further study, particularly the chalk rubble reefs in Poole Bay. The photomosaic approach appears to be a useful technique – the Bournemouth University team were able to revisit and re-survey the scar, producing a second photomosaic which was possible to match up with the first.

The apparently widespread occurrence of *Sabellaria spinulosa* reefs across Poole Bay is interesting. The Colter Environmental survey discovered large, well-formed *Sabellaria* boulders near the scar investigated in this study, apparently associated with the chalk ridge which runs across Poole Bay, either just outcropping or under a thin layer of sediment. The sidescan survey of this area carried out in Jan 2021 revealed dark patches that could represent *Sabellaria* boulders though Bournemouth University divers reported less extensive *Sabellaria* in this area than the site they dived further west around another scar (pers. comm. Alice Hall). Surveys within the Southbourne Rough MCZ also found *Sabellaria*, though more as a thick crust over the rocks than free-

standing clusters. A targeted survey to reveal the extent and condition of *Sabellaria* reefs in Poole Bay would be valuable

Bibliography

Corallian Energy Ltd, 2017. *Colter (98/11-E) Appraisal Well: Environmental Statement*. s.l.:s.n.

Tinsley, P. A., 2021. *Impacts of Large Vessel Anchoring on Seabed Habitats and Marine Protected Areas*. s.l.:Dorset Wildlife Trust/Natural England.

APPENDIX 1 – Seasearch Forms

Please save your completed form then email it to the Dive Organiser, the local Seasearch Coordinator or info@seasearch.org.uk

Form no. (leave blank)

SEASEARCH SURVEY FORM



If anything is unclear please refer to the Guidance Notes.
Each pair of divers should complete a form between them.
Please complete all parts of the form. Where there is a *
fill in the information only if you know it.

Validated by <input type="text"/>	Entered by <input type="text"/>	MR ref. <input type="text"/>
Date	Date	
Recorder leave blank for Seasearch use		

Your details

Name <input type="text"/>	Tel No. <input type="text"/>	hm/wk/mob <input type="text"/>	mobile <input type="text"/>
Address <input type="text"/>		email <input type="text"/>	
		Buddy's name <input type="text"/>	
		Postcode <input type="text"/>	
Name of group or survey <input type="text"/>			

Dive/site details

Site name	<input type="text" value="Anchor scar"/>			Date of dive	<input type="text" value="18/05/2021"/>	
General location	<input type="text" value="Lulworth Banks West, Dorset"/>			Start of dive	<input type="text" value="08:27"/>	(24hr)
				Dive duration	<input type="text" value="45"/>	(mins)
				Sea temperature	<input type="text" value="11"/>	°C
				U/W visibility	<input type="text" value="6"/>	m
Position	Latitude	Longitude	W or E	Drift dive?	<input type="checkbox"/>	
Centre of site	<input type="text" value="50 ° 36.108"/>	<input type="text" value="002 ° 20.215"/>	<input type="text" value="W"/>	Night dive?	<input type="checkbox"/>	
For drift dives				Did you or your buddy take any of the following?		
	From	<input type="text"/>	<input type="text"/>		photographs	<input checked="" type="checkbox"/>
	To	<input type="text"/>	<input type="text"/>		video footage	<input type="checkbox"/>
Or OS Grid Ref	square	E	N		specimens	<input type="checkbox"/>
Position derived from	<input type="text" value="GPS"/>				seaweeds for pressing	<input type="checkbox"/>
GPS datum	<input type="text" value="WGS84"/>			For the area surveyed what was		
				the shallowest depth (m)?	<input type="text" value="21"/> bsl	<input type="text" value="20.0"/> bcd
Exposure of site	<input type="text" value="exposed"/>			the deepest depth (m)?	<input type="text" value="22"/> bsl	<input type="text" value="21.0"/> bcd
Max tidal stream	<input type="text" value="1 - 3 kt"/>			Tidal correction to chart datum		<input type="text" value="0.8"/> m *

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

- a. Almost level dip slope of bedrock reef with cobble, small boulders and thin mixed sediment cover; seafans and erect sponges with bryozoan turf. Cobble and deeper sediment immediately west disturbed by heavy cruise ship anchor and chain, forming two ridges of rubble about 75cm high with mobile, rippled medium sand between - 5m wide. The sand a deep veneer over pebbles.
- b. Almost no visible life in the rubble (small Spirobranchus only and dead bryozoan and coralline algal crusts) and sand swept by the chain.
- c. Anchor and chain damage; several unidentified large items of encrusted rubbish.

APPENDIX 1 – Seasearch Forms

Habitat descriptions

Complete a box below for each **habitat** you found on your dive. Normally the shallowest habitat is No. 1 even if you have done the deepest dive first. Each written description should tally with the information entered in the columns and diagrams on the next page. If you found more than 3 habitats, continue your descriptions on another form. Tick boxes where shown, and insert percentages (they must add up to 100%) or assign a score from 1-5 as appropriate. If you are uncertain leave the box blank. The biotope code will be assigned later from your description,

1. DESCRIPTION (physical and community)

Almost level bedrock reef dipping slightly to the NW, with cobble, small boulders and thin veneer of mixed sediment cover; seafans including juveniles and erect sponges; occasional *Aequipecten opercularis* and rare *Pecten maximus*. Bryozoan turf, particularly on the boulders. Two strips across the reef were denuded of much of the life seen elsewhere on the reef, in particular there was a complete absence of seafans and erect sponges.

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

2. DESCRIPTION (physical and community)

Sand and cobble seabed redistributed by movement of cruise ship anchor and chain, into two parallel banks of rubble and cobble with mobile mixed coarse and medium sand between; some empty and broken scallop and otter shells in and on the sand. The banks extended west from the reef for around 20m, then swung to the north. There was hardly any obvious life on the rubble banks or in the sand between them.

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

3. DESCRIPTION (physical and community)

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

APPENDIX 1 – Seasearch Forms

1	2	3	
m			DEPTH LIMITS
21	21		Upper (from sea level) (i.e. minimum)
21	22		Lower (from sea level) (i.e. maximum)
			Upper (from chart datum) *
			Lower (from chart datum) *

%			SUBSTRATUM
70			Bedrock type?
			Boulders - very large > 1.0 m
			- large 0.5 - 1.0 m
10	10		- small 0.25 - 0.5 m
20	50		Cobbles (fist - head size)
	5		Pebbles (50p - fist size)
			Gravel - stone
			- shell fragments
20			Sand - coarse
15			- medium
			- fine
			Mud
			Shells (empty or as large pieces)
			Shells (living e.g. mussels, limpets)
			Artificial - metal
			- concrete
			- wood
			Other (state)
100	100		Total = 100 please!

1	2	3	
1-5			FEATURES - ROCK (all categories)
2	3	<input type="checkbox"/>	Relief of habitat (even - rugged)
3	4	<input type="checkbox"/>	Texture (smooth - pitted)
2	3	<input type="checkbox"/>	Stability (stable - mobile)
3	3	<input type="checkbox"/>	Scour (none - scoured)
2	1	<input type="checkbox"/>	Silt (none - silted)
1	3	<input type="checkbox"/>	Fissures > 10 mm (none - many)
2	3	<input type="checkbox"/>	Crevice < 10 mm (none - many)
3	3	<input type="checkbox"/>	Boulder/cobble/pebble shape (rounded - angular)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sediment on rock? (tick if present)

tick	FEATURES - SEDIMENT (1)
<input type="checkbox"/>	Mounds / casts
<input type="checkbox"/>	Burrows / holes
<input type="checkbox"/>	Waves (> 10 cm high)
<input type="checkbox"/>	Ripples (< 10 cm high)
<input type="checkbox"/>	Subsurface coarse layer
<input type="checkbox"/>	Subsurface anoxic (black) layer

1-5			FEATURES - SEDIMENT (2)
<input type="checkbox"/>	3	<input type="checkbox"/>	Firmness (firm - soft)
<input type="checkbox"/>	4	<input type="checkbox"/>	Stability (stable - mobile)
<input type="checkbox"/>	2	<input type="checkbox"/>	Sorting (well - poor)

NOTE: H1 bedrock covered with thin mixed sediment near the western edge

Sketches and plans

Insert a **profile and/or plan** of the seabed you encountered on your dive into the space below (click in the space). Mark (& number the different habitats, corresponding to the written descriptions on p.2. Indicate conspicuous and/or characteristic species. Make sure you include **depth(s)** (vertical axis and a **distance** scale (horizontal axis) for a profile and scale and north point for a plan. Indication the direction of the profile or plan and the direction of any current.

APPENDIX 1 – Seasearch Forms

Species List

Score the abundance of each group of animals and plants in each habitat alongside the name. In the blank spaces list the seaweeds and animals that you were able to identify **positively** from the different habitats. Use Latin names if possible, but if you do not know them common or descriptive names are acceptable. If you are not 100% sure about any, add a question mark. Do not enter names as guesses - it is better to exclude them than to include incorrect identifications. Give abundances in the columns: **Superabundant**, **Abundant**, **Common**, **Frequent**, **Occasional** & **Rare**. If you did not note abundances, simply enter a **P** for Present. Continue on a separate sheet if necessary. If you have a photograph of the species tick the **ph** column.
 YOU CAN CUT AND PASTE GROUP HEADINGS FROM THE BOTTOM INTO ANY POSITION IN THE LIST

	ph	1	2	3		ph	1	2	3
SPONGES		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BRYOZOANS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Polytmastia boletiformis		R	<input type="checkbox"/>	<input type="checkbox"/>	Pentapora foliacea		R	<input type="checkbox"/>	<input type="checkbox"/>
Dysidea fragilis		O	<input type="checkbox"/>	<input type="checkbox"/>	Alcyonidium diaphanum		R	<input type="checkbox"/>	<input type="checkbox"/>
Cliona celata		R	<input type="checkbox"/>	<input type="checkbox"/>	Chartella papyracea		F	R	<input type="checkbox"/>
Polymastia cf. agglutinans		P	<input type="checkbox"/>	<input type="checkbox"/>	Cellepora pumicosa		R	<input type="checkbox"/>	<input type="checkbox"/>
Axinella dissimilis		R	<input type="checkbox"/>	<input type="checkbox"/>	Bubula sp. plumosa LB		P	<input type="checkbox"/>	<input type="checkbox"/>
Ciocalyptra penicillus		R	<input type="checkbox"/>	<input type="checkbox"/>	Flustra foliacea		R	<input type="checkbox"/>	<input type="checkbox"/>
Raspailia hispida		F	<input type="checkbox"/>	<input type="checkbox"/>	Omalosecosa ramulosa		R	<input type="checkbox"/>	<input type="checkbox"/>
miscellaneous crusts		R	R	<input type="checkbox"/>	orange crusts		O	<input type="checkbox"/>	<input type="checkbox"/>
Tethya citrina LB		R	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CNIDARIANS: hydroids/anemones/corals		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ECHINODERMS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Isozoanthus sulcatus		P	<input type="checkbox"/>	<input type="checkbox"/>	Henricia LB		R	<input type="checkbox"/>	<input type="checkbox"/>
Eunicella verrucosa		O	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Abietinaria abietina		R	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Amphisbetia operculata		R	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Halecium halecinum		<input type="checkbox"/>	R	<input type="checkbox"/>	SEA SQUIRTS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Imperial anemone LB		R	<input type="checkbox"/>	<input type="checkbox"/>	Polycarpa errans		R	<input type="checkbox"/>	<input type="checkbox"/>
Alcyonium dig LB		R	<input type="checkbox"/>	<input type="checkbox"/>	Pyura microcosmus		R	<input type="checkbox"/>	<input type="checkbox"/>
Sertularia argentea LB		R	<input type="checkbox"/>	<input type="checkbox"/>	Styela clava LB		R	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Molgula turf type? LB		R	<input type="checkbox"/>	<input type="checkbox"/>
WORMS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pycnoclavella auri		R	<input type="checkbox"/>	<input type="checkbox"/>
Spirobranchus very small in Hab 2		O	O	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Salmacina / Filograna		R	<input type="checkbox"/>	<input type="checkbox"/>	FISHES		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
terebellid tentacles		O	<input type="checkbox"/>	<input type="checkbox"/>	Ctenolabrus rupestris		R	<input type="checkbox"/>	<input type="checkbox"/>
Serpula vermic LB		R	<input type="checkbox"/>	<input type="checkbox"/>	Gobius niger		<input type="checkbox"/>	R	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cancer pagurus		R	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maja brachydactyla		R	<input type="checkbox"/>	<input type="checkbox"/>	SEAWEEDS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
barnacles		F	C	<input type="checkbox"/>	Phyllophora crispa		R	<input type="checkbox"/>	<input type="checkbox"/>
Necora puber LB		<input type="checkbox"/>	R	<input type="checkbox"/>	epa		R	O	<input type="checkbox"/>
Paguridae LB		R	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MOLLUSCS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Crimora papillata		R	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Doris pseudoargus		R	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aequipecten opercularis		F	R	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Calliostoma zizyphinum		R	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rocellaria dubia		P	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

You can continue your species list on the next page

APPENDIX 1 – Seasearch Forms

Please save your completed form then email it to the Dive Organiser, the local Seasearch Coordinator or info@seasearch.org.uk

Form no. (leave blank) DT21/031

SEASEARCH SURVEY FORM



If anything is unclear please refer to the Guidance Notes.
Each pair of divers should complete a form between them.
Please complete all parts of the form. Where there is a *
fill in the information only if you know it.

Validated by B Baldock	Entered by B Baldock	MR ref. MRLRC0260000014
Date 17/07/2021	Date 24/02/2022	Recorder leave blank for Seasearch use

Your details

Name	Tel No.	hm/wk/mob	mobile
Address	email		
	Buddy's name		
	Postcode		
Name of group or survey Portland Expedition 2021			

Dive/site details

Site name	Potential Anchor Scar, W Lulworth Banks			Date of dive	18/05/2021		
General location	West Lulworth Banks, East of Weymouth Bay, Dorset			Start of dive	08:37 (24hr)		
				Dive duration	39 (mins)		
				Sea temperature	11 °C		
				U/W visibility	4 m		
Position	Latitude	Longitude	W or E	Drift dive?	<input type="checkbox"/>		
Centre of site	50 ° 36.108	002 ° 20.215	W	Night dive?	<input type="checkbox"/>		
For drift dives				Did you or your buddy take any of the following?			
From	°	°		photographs	<input checked="" type="checkbox"/>		
To	°	°		video footage	<input type="checkbox"/>		
Or OS Grid Ref	square	E	N	specimens	<input type="checkbox"/>		
Position derived from	GPS			seaweeds for pressing	<input type="checkbox"/>		
GPS datum	WGS84			For the area surveyed what was			
Exposure of site	moderately exposed			the shallowest depth (m)?	20 bsl		bcd
				the deepest depth (m)?	22 bsl		bcd
Max tidal stream	1 - 3 kt			Tidal correction to chart datum	0.8		m *

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

a) sediment covered rocky reef, with healthy growth of Eunicella verrucosa and sponges (habitat 1). Also, a good number of Aequipecten opercularis was present, especially on the parts of the reef covered in more sediment. Swimming north, the relatively even seabed then turned into a narrow strip of "rubble", consisting of medium to large to very large boulders with fairly little life on them and partially standing at steep angles and stacked, as if disturbed relatively recently (habitat 2). Further North to this area, the layer of sediment increased (sediment veneer?), almost losing any characteristics of a rocky reef (habitat 3, not surveyed for very long).

b) Styela clava, shark egg (yellow, long tassles, clean - fresh Scyliorhinus canicula?)

c) discarded net/trap, metal (gas?) metal canister/bottle, hose, all in or close to habitat 2

APPENDIX 1 – Seasearch Forms

Habitat descriptions

Complete a box below for each **habitat** you found on your dive. Normally the shallowest habitat is No. 1 even if you have done the deepest dive first. Each written description should tally with the information entered in the columns and diagrams on the next page. If you found more than 3 habitats, continue your descriptions on another form. Tick boxes where shown, and insert percentages (they must add up to 100%) or assign a score from 1-5 as appropriate. If you are uncertain leave the box blank. The biotope code will be assigned later from your description,

1. DESCRIPTION (physical and community)

Rocky reef with fairly low and flat topography, covered in sediment (mud and sand), which in some parts was relatively deep, but the habitat was always clearly identifiable as rocky reef. Several *Eunicella verrucosa* were present, from very small to medium sized ones. Sponges (probably the dominating larger life form), other large hydroids and large bryozoans (e.g. *Pentapora*) were widely distributed as well, but never very densely clustered. Where not covered in a sediment layer, the largest area of the rocks was covered in a very low, silt trapping turf, not really identifiable, and very low growth of red algae. The subjective perception was that this part was fairly healthy.

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

2. DESCRIPTION (physical and community)

Area (a few m wide) of mainly large boulders, lying partially stacked and/or at steep angles semi-upright. The boulders were fairly silt free and almost exclusively overgrown with orange encrusting sponges and especially barnacles, or even barren. Apart from the topography, the most striking feature was the absence of *E. verrucosa* and most larger sponges. The area gave a "disturbed" impression, especially after the relatively flat and well-overgrown habitat 1

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

3. DESCRIPTION (physical and community)

Sand and mud with lots of intact and broken bivalve shells. Sediment forming either a thick veneer on a rocky reef, or cobbles and small boulders were buried in the sand, as sometimes sponges and hydroids were seen growing through the sediment. No holes, mounds or bivalve siphons were recorded, but the habitat was only surveyed for a few minutes before ascent.

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

APPENDIX 1 – Seasearch Forms

1	2	3	
m			DEPTH LIMITS
20	20	21	Upper (from sea level) (i.e. minimum)
21	21	22	Lower (from sea level) (i.e. maximum)
19	19	20	Upper (from chart datum) *
20	20	21	Lower (from chart datum) *

%			SUBSTRATUM
55			Bedrock type?
	20		Boulders - very large > 1.0 m
10	50		- large 0.5 - 1.0 m
10	10	5	- small 0.25 - 0.5 m
		20	Cobbles (fist - head size)
		25	Pebbles (50p - fist size)
		10	Gravel - stone
5	5	20	- shell fragments
			Sand - coarse
20	10	10	- medium
			- fine
			Mud
	5	10	Shells (empty or as large pieces)
			Shells (living e.g. mussels, limpets)
			Artificial - metal
			- concrete
			- wood
			Other (state)
100	100	100	Total = 100 please!

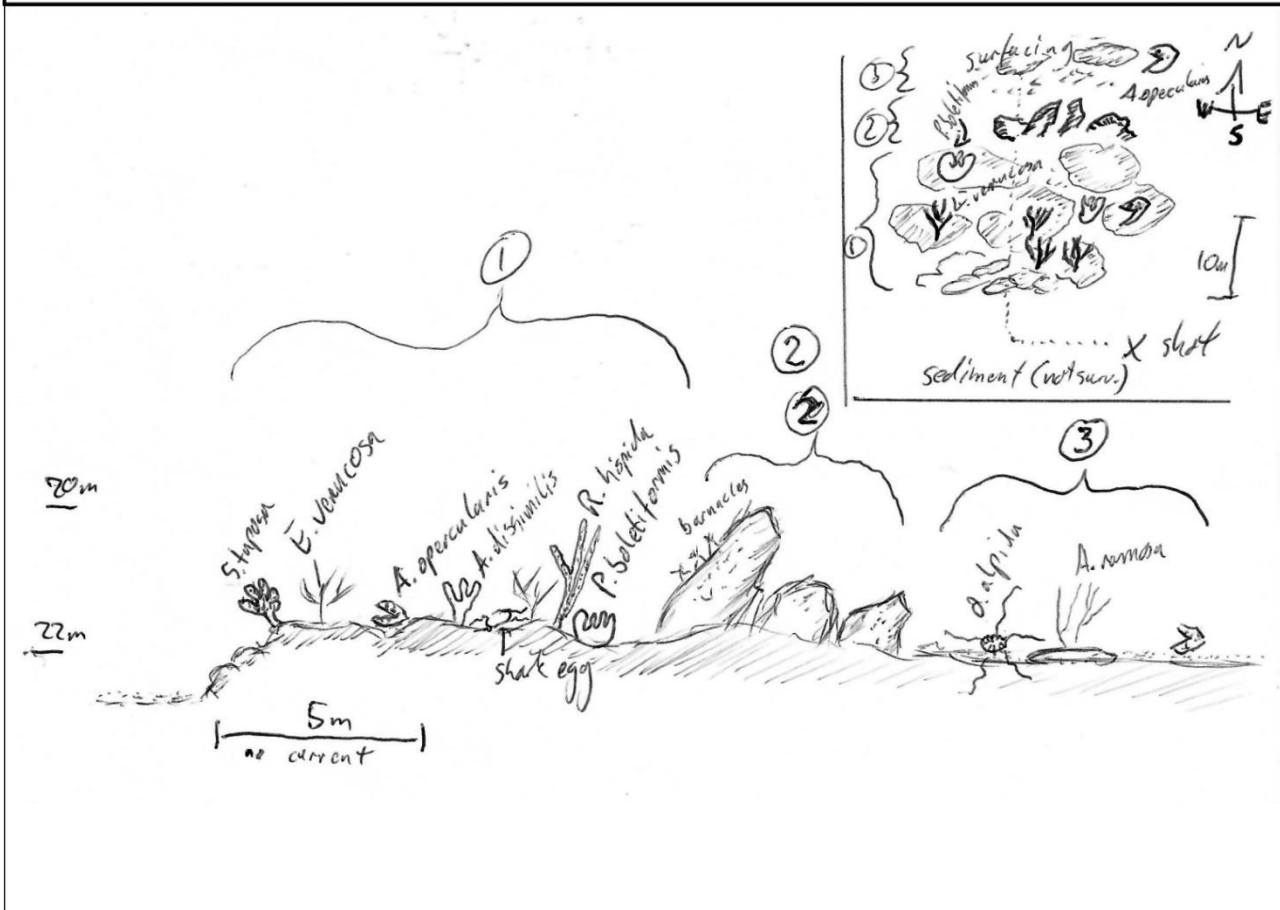
1	2	3	
1-5			FEATURES - ROCK (all categories)
1	5	1	Relief of habitat (even - rugged)
3	4	3	Texture (smooth - pitted)
1	1	1	Stability (stable - mobile)
1	4	1	Scour (none - scoured)
3	1	3	Silt (none - silted)
3	3	1	Fissures > 10 mm (none - many)
3	1	1	Crevice < 10 mm (none - many)
2	5	3	Boulder/cobble/pebble shape (rounded - angular)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sediment on rock? (tick if present)

tick			FEATURES - SEDIMENT (1)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Mounds / casts
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Burrows / holes
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Waves (> 10 cm high)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ripples (< 10 cm high)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Subsurface coarse layer
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Subsurface anoxic (black) layer

1-5			FEATURES - SEDIMENT (2)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Firmness (firm - soft)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Stability (stable - mobile)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sorting (well - poor)

Sketches and plans

Insert a **profile and/or plan** of the seabed you encountered on your dive into the space below (click in the space). Mark (& number the different habitats, corresponding to the written descriptions on p.2. Indicate conspicuous and/or characteristic species. Make sure you include **depth(s)** (vertical axis and a **distance** scale (horizontal axis) for a profile and scale and north point for a plan. Indication the direction of the profile or plan and the direction of any current.



APPENDIX 1 – Seasearch Forms

Species List

Score the abundance of each group of animals and plants **in each habitat** alongside the name. In the blank spaces list the seaweeds and animals that you were able to identify **positively** from the different habitats. Use Latin names if possible, but if you do not know them common or descriptive names are acceptable. If you are not 100% sure about any, add a question mark. Do not enter names as guesses - it is better to exclude them than to include incorrect identifications. Give abundances in the columns: Superabundant, Abundant, Common, Frequent, Occasional & Rare. If you did not note abundances, simply enter a **P** for Present. Continue on a separate sheet if necessary. If you have a photograph of the species tick the **ph** column.
YOU CAN CUT AND PASTE GROUP HEADINGS FROM THE BOTTOM INTO ANY POSITION IN THE LIST

	ph	1	2	3		ph	1	2	3
SPONGES		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ECHINODERMS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
bright orange encrusting	<input checked="" type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>	Crevice sea cucumbers	<input checked="" type="checkbox"/>	F	<input type="checkbox"/>	<input type="checkbox"/>
Stelligera stuposa	<input checked="" type="checkbox"/>	O	<input type="checkbox"/>	<input type="checkbox"/>	Pawsonia saxicola	<input checked="" type="checkbox"/>	P	<input type="checkbox"/>	<input type="checkbox"/>
Polymastia boletiformis	<input checked="" type="checkbox"/>	O	<input type="checkbox"/>	<input type="checkbox"/>	Anseropoda placenta	<input checked="" type="checkbox"/>	R	<input type="checkbox"/>	R
Cliona celata	<input checked="" type="checkbox"/>	O	<input type="checkbox"/>	<input type="checkbox"/>	Ophiura albida	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R
Raspailia hispida	<input checked="" type="checkbox"/>	O	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Raspailia ramosa	<input checked="" type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Axinella dissimilis	<input checked="" type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>	SEA SQUIRTS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ciocalypa penicillus	<input checked="" type="checkbox"/>	R	<input type="checkbox"/>	R	Polycarpa scuba w/ LOTS of silt on it??	<input checked="" type="checkbox"/>	P	<input type="checkbox"/>	<input type="checkbox"/>
Dysidea fragilis	<input checked="" type="checkbox"/>	O	<input type="checkbox"/>	<input type="checkbox"/>	Lissoclinum perforatum	<input checked="" type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>
Hemimycale columella	<input checked="" type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>	Ciona intestinalis	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ctenolabrus rupestris		R	<input type="checkbox"/>	<input type="checkbox"/>
CNIDARIANS: hydroids/anemones/corals			<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Eunicella verrucosa	<input checked="" type="checkbox"/>	F	<input type="checkbox"/>	<input type="checkbox"/>	FISHES		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nemertesia antennina	<input checked="" type="checkbox"/>	R	<input type="checkbox"/>	R	Gobius sp.	<input checked="" type="checkbox"/>	R	R	
Nemertesia ramosa	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R	Callionymus sp.	<input checked="" type="checkbox"/>	R		R
feathery hydroids (Sertularella sp.?)	<input checked="" type="checkbox"/>	R	<input type="checkbox"/>	R	Pomatoschistus sp.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	R	<input type="checkbox"/>
Calliactis parasitica	<input checked="" type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>	Scylliorhinus canicula? eggcase	<input checked="" type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>
Alcyonium digitatum	<input checked="" type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>	Ctenolabrus rupestris		R	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SEAWEEEDS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WORMS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Phyllophora crispa (?)	<input checked="" type="checkbox"/>	O	R	R
Bispira volutacornis	<input checked="" type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>	epa	<input checked="" type="checkbox"/>	<input type="checkbox"/>	R	R
Myxicola infudibulum	<input checked="" type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRUSTACEANS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cirripedia	<input checked="" type="checkbox"/>	<input type="checkbox"/>	F	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MOLLUSCS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aequipecten opercularis	<input checked="" type="checkbox"/>	C	R	O			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Calliostoma zephyrinum	<input checked="" type="checkbox"/>	R	R	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tritia reticulata	<input checked="" type="checkbox"/>	R	R	O			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pecten maximus	<input checked="" type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Crimora papillata	<input checked="" type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Buccinum undulatum eggs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	R	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BRYOZOANS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
silted up "bryozoans" (possibly...?)	<input checked="" type="checkbox"/>	O	<input type="checkbox"/>	R	SPONGES		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flustra foliacea	<input checked="" type="checkbox"/>	O	<input type="checkbox"/>	R	CNIDARIANS: hydroids/anemones/corals		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Alcyonidium diaphanum	<input checked="" type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>	WORMS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pentapora foliacea	<input checked="" type="checkbox"/>	O	<input type="checkbox"/>	<input type="checkbox"/>	CRUSTACEANS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Omalosecosa ramulosa?	<input checked="" type="checkbox"/>	O	<input type="checkbox"/>	R	MOLLUSCS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chantella papyracea	<input checked="" type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>	BRYOZOANS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electra pilosa	<input checked="" type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>	ECHINODERMS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Styela clava	<input checked="" type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>	SEA SQUIRTS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cellepora pumicosa	<input checked="" type="checkbox"/>	O	R	<input type="checkbox"/>	FISHES		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SEAWEEEDS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

You can continue your species list on the next page