

Revealing the reef:
10 years of marine life settling on ex-HMS *Scylla*

Keith Hiscock

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The presentation:

- How *Scylla* was before sinking on 27 March 2004.
- The ‘time-line’ of marine life settlement.
- How you can help maintain records from *Scylla* – and get involved in reporting marine life observations.

(All with thanks to: Plymouth Sound BS-AC; MCS local group especially Amy Bugg; Sally Sharrock; Peter Messenger; University of Plymouth Diving Centre, Unicomarine for identification of samples, and many others for the diving, the marine life records and the use of images.

And, of course, the National Marine Aquarium with the Canadian Artificial Reefs Consortium for putting *Scylla* on the seabed - right-way-up.)

(Background image: The bow of *Scylla* on 26th February 2009)

19th November 2003. Devonport

Scylla was brought from Portsmouth to Devonport where she arrived on 18 November 2003. The next morning, the water had drained from the dry dock and the vessel was ready to be prepared for sinking.
The work of obtaining the licence to place her on the seabed, preparing the vessel and overseeing the project was undertaken by the National Marine Aquarium in Plymouth after many years of work to secure a vessel and sink it by the Artificial Reef Consortium.

Inspection of existing fouling

Part of the licence to place the vessel on the seabed was to catalogue the fouling organisms present on the vessel on arrival from Portsmouth: a task undertaken by staff from the Marine Biological Association in Plymouth.

The survey listed species and discovered just how effective existing anti-fouling paint was – significant areas of the hull were bare of fouling.

Oysters, sponges, barnacles etc. on one of the propellers

A tantalizing view of one of the two propellers – removed as part of the preparation for sinking. The attached fauna included, surprisingly, several native oysters as well as sponges, barnacles and many dahlia anemones.

27 March 2004

The vessel was towed to a predetermined and licensed site in Whitsand Bay and strategically placed explosives were detonated to sink the vessel. The vessel had to sink quickly (within 3 minutes) to avoid oscillations and tipping. There were anxious moments as she lent over a little to starboard and great relief when she landed right way-up with only a slight list to starboard – where she has remained ever since.

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Scylla. In the first year:

1. a small numbers of potentially resident fish (poor cod) were attracted after about 10 days;

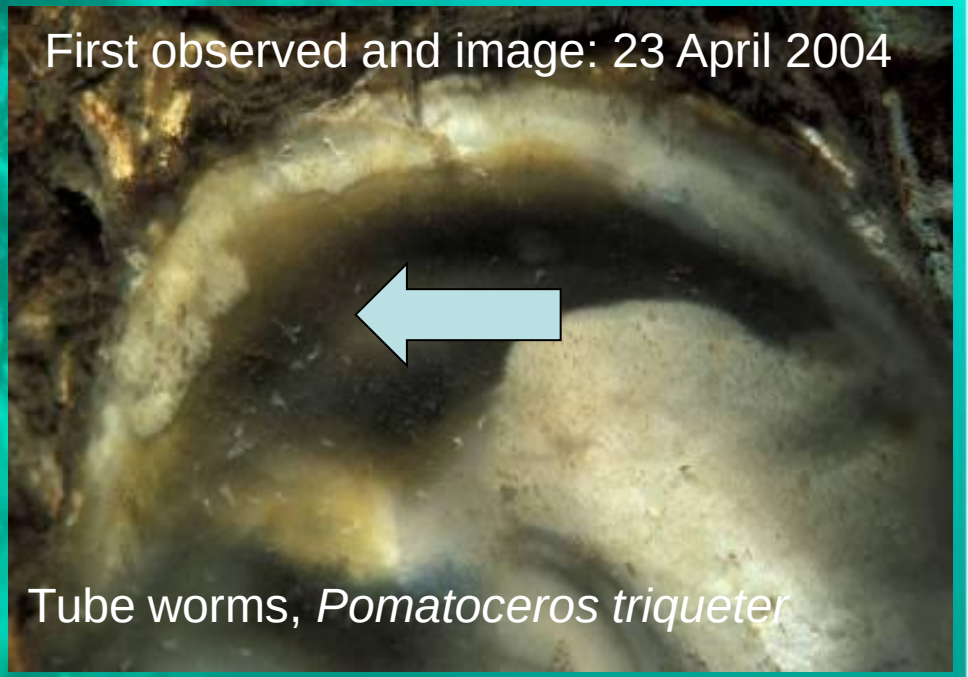
2. colonisation by barnacles, tube worms, *Obelia* hydroids and microbial slime occurred within about four weeks;

3. ‘wandering’ species found the reef (spiny starfish, spiny spider crabs, long-spined sea scorpion etc.);

4. barnacles, tube worms and *Obelia* hydroids became common at about 6-7 weeks and were joined by *Tubularia* hydroids and, on shallow parts, brown filamentous algae;

5. by ten weeks after placement, the variety of organisms was significant and kelp, solitary sea squirts, anemones etc. had settled.

Colonisation by microbial slime, barnacles, tube worms and *Obelia* hydroids had occurred within about four weeks



Brown filamentous algae were profuse during the spring and before grazing species arrived in significant numbers.

‘Wandering’ species found the reef from the surrounding seabed. Here, the spiny starfish, *Marthasterias glacialis*. Other species settled from their larvae in the plankton. Here, sea squirts, *Ciona intestinalis.*

Scylla. In the first year (continued):

6. by 18 weeks, a wide variety of species including a mass settlement of juvenile queen scallops, many '*decorata*' anemones, extensive growths of *Tubularia* hydroids, a variety of algae etc. Mussels were settling. Tube worms and solitary sea squirts cover some surfaces. Algae abundant on upper surfaces;

7. by 24 weeks, green urchins and common starfish had settled in large numbers;

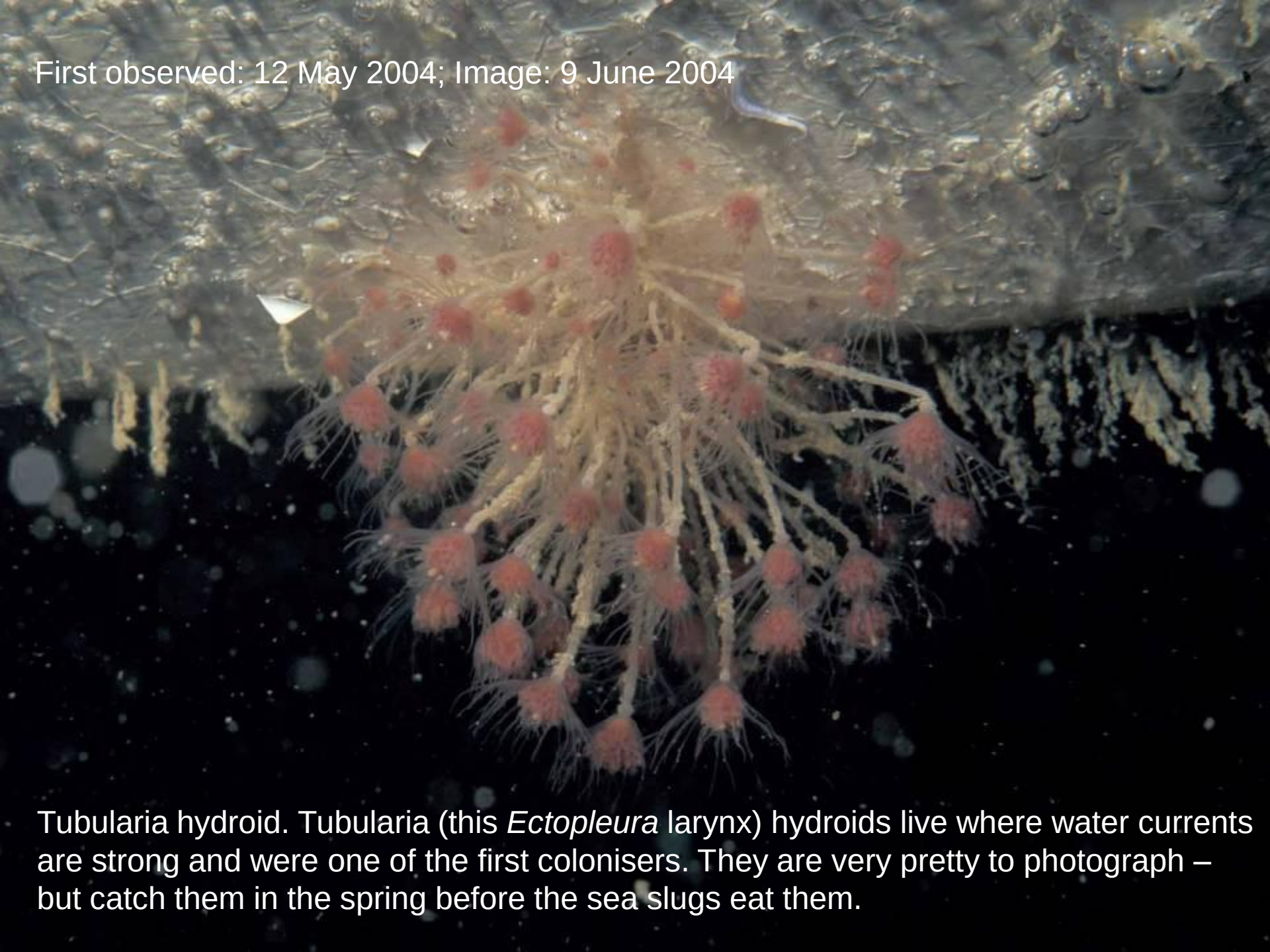
8. by 30 weeks, juvenile queen scallops were abundant over and in the vessel. Green urchins and common starfish now abundant and largish.


First observed: 26 July 2004; Image: 30 July 2004
Queen scallops settle. The scallop is only about 8 mm across.

Queen scallop, *Aequipecten opercularis* inside the vessel. Most of the scallops probably left the reef for their usual habitat on level sediments after the summer, although some stayed inside the reef on decking. This one was about 30 mm across.

First observed: 30 July 2004; Image: 30 July 2004

One of the earliest ‘surprise’ colonists was the sea anemone that rejoices in the name *Sagartia troglodytes* variety *decorata*. However, speaking to ancient marine biologists it turns out “Oh yes, they were always one of the first things to settle on new surfaces.” (Picture width about 50 mm.)

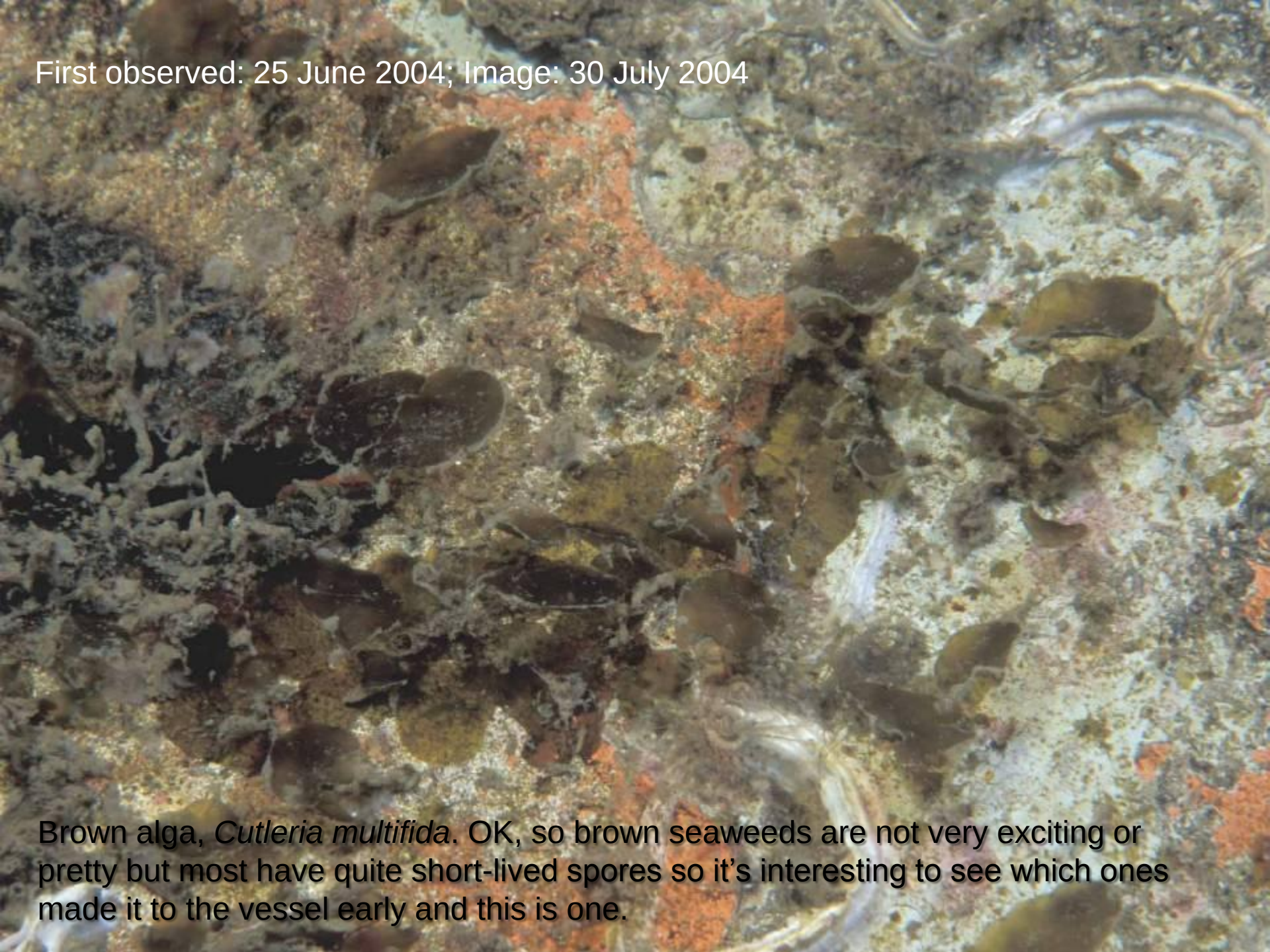


Tubularia hydroid. Tubularia (this *Ectopleura* larynx) hydroids live where water currents are strong and were one of the first colonisers. They are very pretty to photograph – but catch them in the spring before the sea slugs eat them.

Encrusting sea mat, *Electra pilosa*. Another early coloniser - on the fabric covered ceiling of the bridge

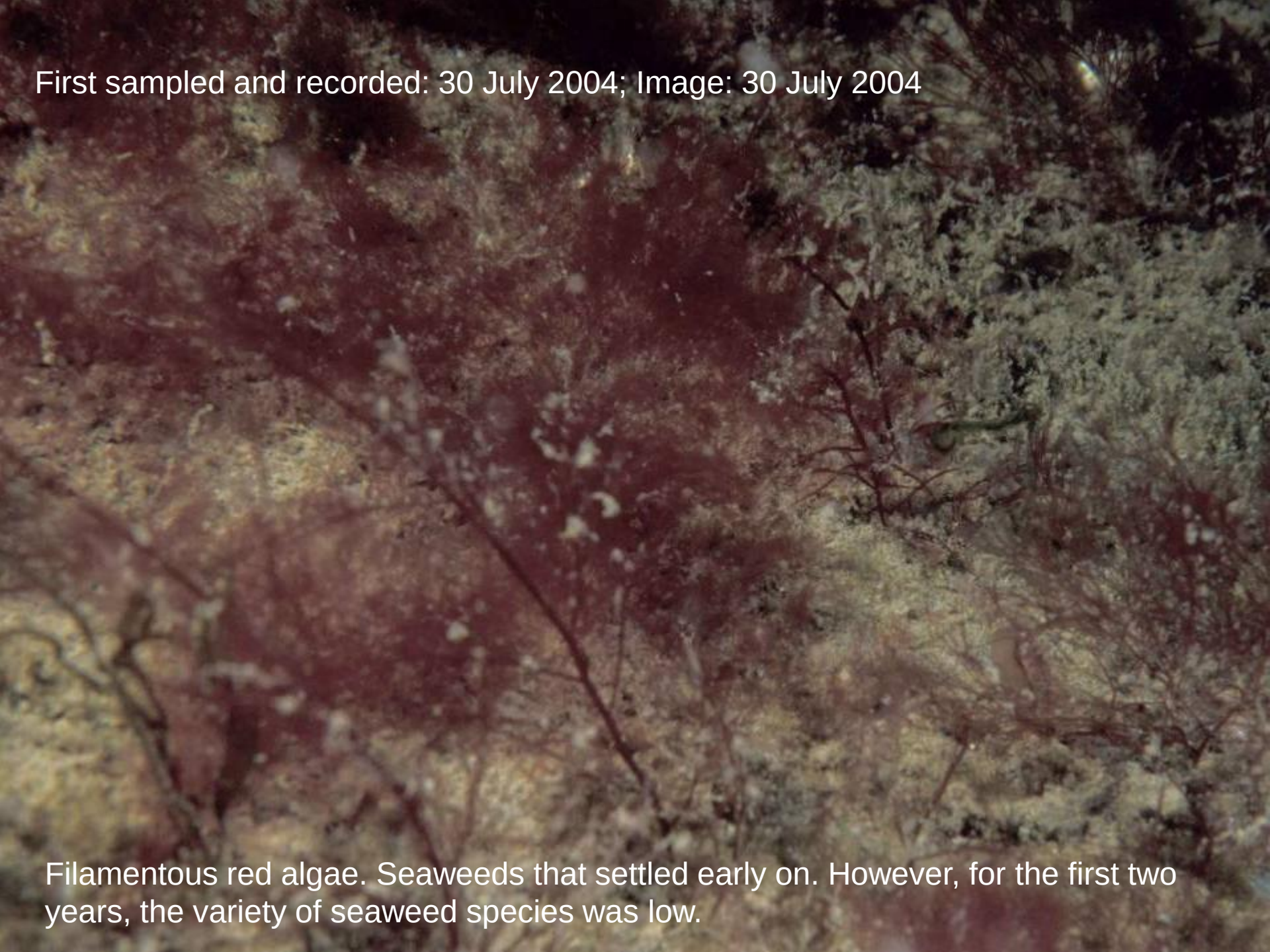
First observed: 9 June 2004; Image: 30 July 2004

Solitary sea squirts, *Ciona intestinalis*. A ‘classic’ early settler and a ‘classic’ solitary sea squirt. You can see the two siphons – one takes in water which is sieved internally and then passed-out through the other.



First observed: 25 June 2004; Image: 30 July 2004

Brown alga, *Cutleria multifida*. OK, so brown seaweeds are not very exciting or pretty but most have quite short-lived spores so it's interesting to see which ones made it to the vessel early and this is one.



First sampled and recorded: 30 July 2004; Image: 30 July 2004

Filamentous red algae. Seaweeds that settled early on. However, for the first two years, the variety of seaweed species was low.

Sea slug *Facelina bostoniensis* and eggs. Very pretty – but it eats Tubularia hydroids. The white spiral is the egg mass.

By end of the first summer: dense colonisation – but the urchins and starfish have settled. Remember this picture for a later image – it shows the high level of colonisation by the end of the first summer – still none of the ‘classic’ steel wreck species.


First observed: 26 July 2004; Image: 10 November 2004
From mid summer to autumn, there were mussels – but starfish eat mussels.
Image: Sally Sharrock

Scylla. In the first year (continued)

By midwinter (40-48 weeks):

9. green sea urchins together with normal seasonal decline have removed algal growth as well as much barnacle and tube worm cover;

10. common starfish have removed mussels, barnacles and, no doubt, other species;

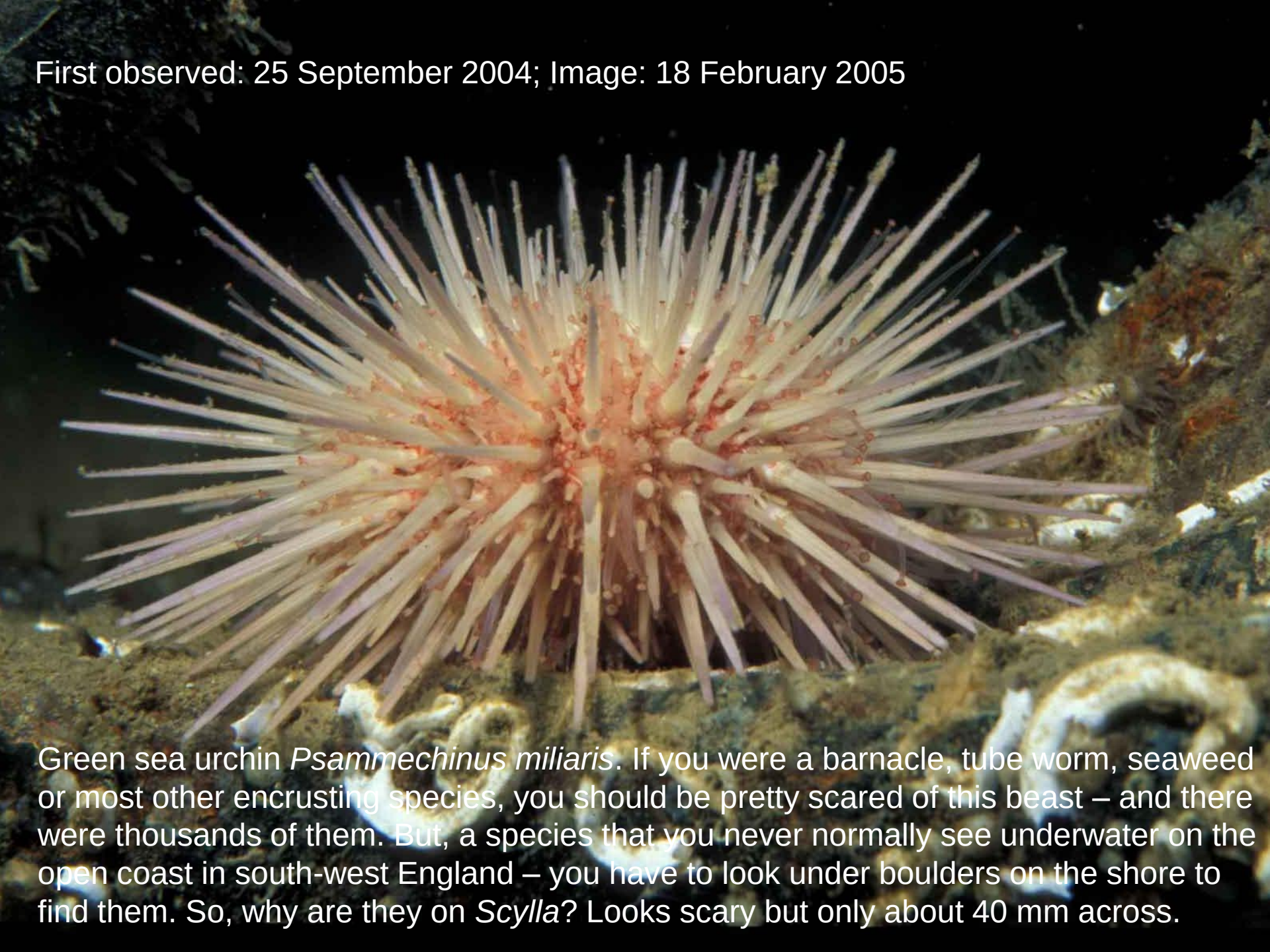
11. the reef looks ‘bare’;

12. plumose anemones are reproducing (by basal laceration) and are becoming visually dominant near the bow;

13. calcareous sponges have settled;

14. corkwing wrasse observed ‘holding territory’.

First observed: 25 September 2004; Image: 18 February 2005

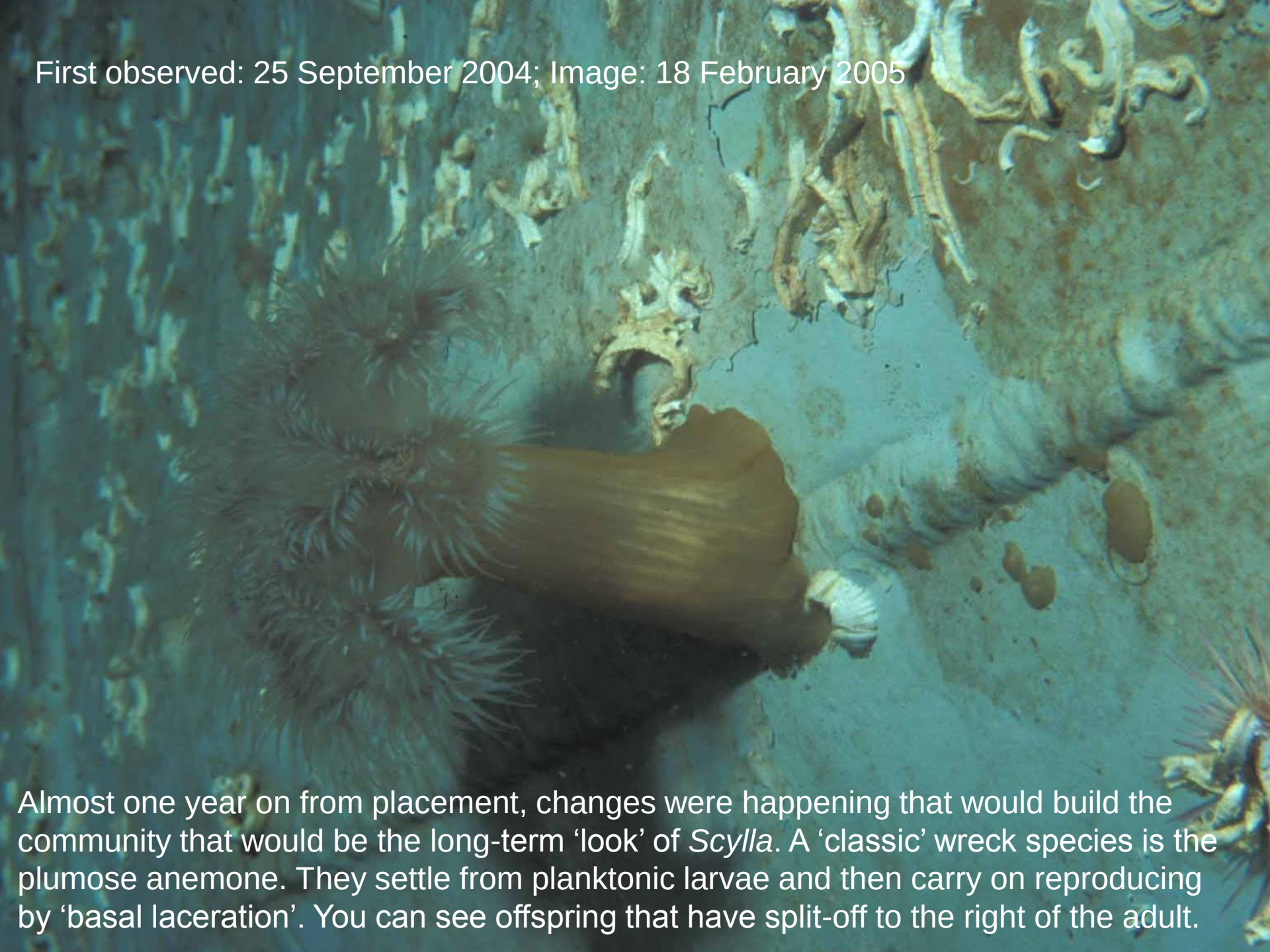


Green sea urchin *Psammechinus miliaris*. If you were a barnacle, tube worm, seaweed or most other encrusting species, you should be pretty scared of this beast – and there were thousands of them. But, a species that you never normally see underwater on the open coast in south-west England – you have to look under boulders on the shore to find them. So, why are they on *Scylla*? Looks scary but only about 40 mm across.

Common starfish, *Asterias rubens*. Starfish are voracious predators and, once settled on *Scylla*, they grew quickly. They will eat mussels, barnacles and anything they can get into.

18 February 2005

Cleaned by urchins & starfish. Towards the end of the first winter, *Scylla* was looking well-cleaned. You can see the fairly evenly distributed starfish and urchins on the vertical surface below the windows.



First observed: 25 September 2004; Image: 18 February 2005

Almost one year on from placement, changes were happening that would build the community that would be the long-term ‘look’ of *Scylla*. A ‘classic’ wreck species is the plumose anemone. They settle from planktonic larvae and then carry on reproducing by ‘basal laceration’. You can see offspring that have split-off to the right of the adult.

First observed: 30 January 2005; Image: 30 January 2005

Corkwing wrasse on the starboard walkway. Wrasse were extremely slow to colonise the reef. However, as early as January 2005, a small number were present. It seemed that it would take a long time for numbers to build to the sort of abundance on the nearby James Egan Layne.

Scylla. In the first year (continued)

By the end of and after one year (50-55 weeks):

15. much of vessel still very bare (grazed);

16. but, algae have returned;

17. common starfish declining and green sea urchins possibly less abundant.

19 March 2005

Compare this view of the bow with the one taken in September 2004 – a combination of winter die-back but predominantly grazing has left the bow ‘clean’ where it had been densely colonised.

By the end of one year, we had:

1. recorded (through the year and from various sources) a total of 53 conspicuous species on or in *Scylla* (excluding surrounding seabed species);

2. been able to track sequence of species colonisation (and loss) through the year;

3. had a few surprises (unexpected settlements).

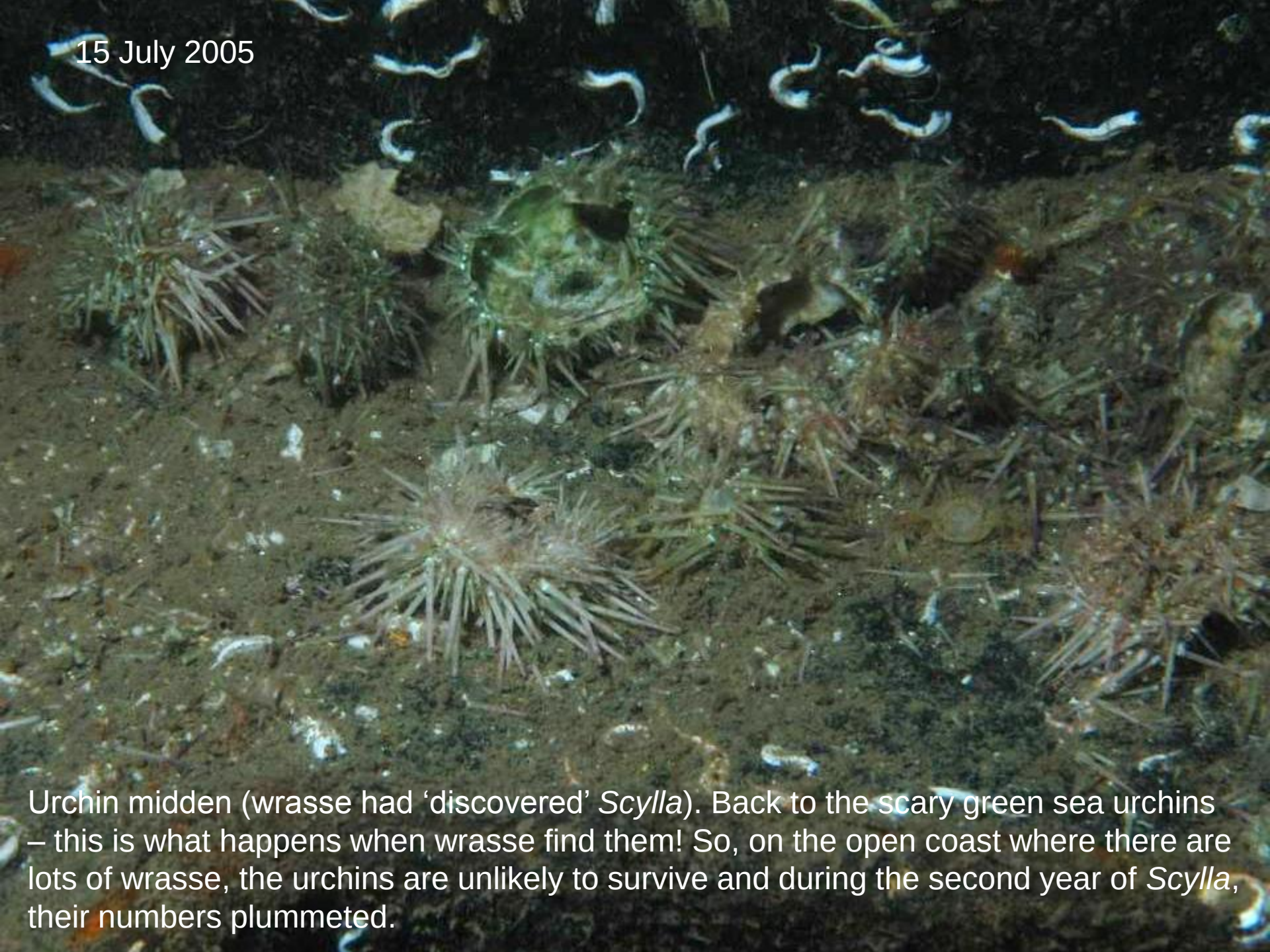
In the second year (2005): losses and gains

1. Grazing much less (sea urchins decline dramatically, starfish less abundant).

2. Some significant new species settle.

3. Plumose anemones become visually dominant in many areas.

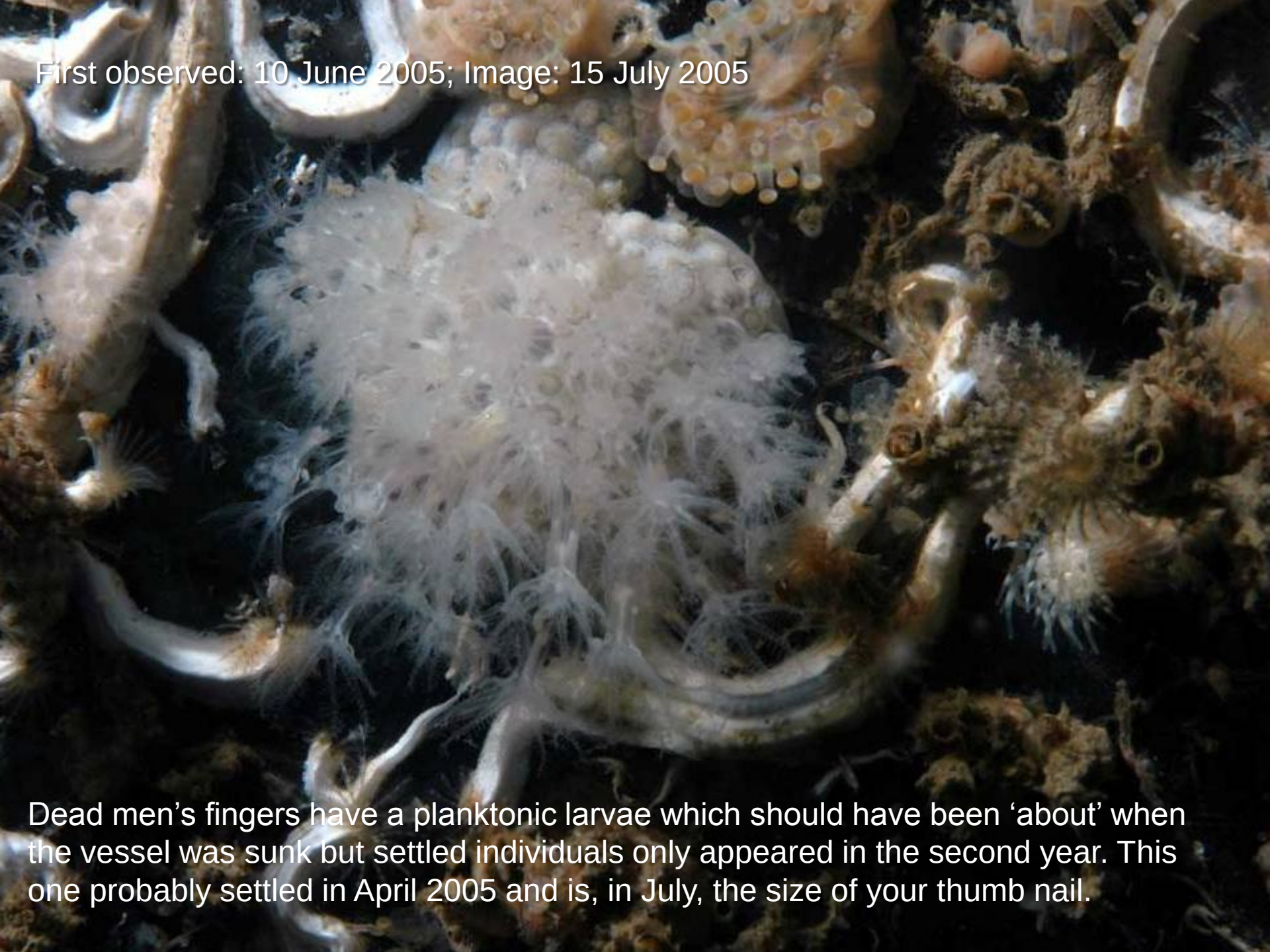
4. In the reduced grazing regime, tubeworms, barnacles and foliose algae thrive.



Urchin midden (wrasse had ‘discovered’ *Scylla*). Back to the scary green sea urchins – this is what happens when wrasse find them! So, on the open coast where there are lots of wrasse, the urchins are unlikely to survive and during the second year of *Scylla*, their numbers plummeted.

During the spring and summer of the second year, algae colonised the foredeck – but a small variety of filamentous species.

Jewel anemones settled in 2005



Dead men’s fingers have a planktonic larvae which should have been ‘about’ when the vessel was sunk but settled individuals only appeared in the second year. This one probably settled in April 2005 and is, in July, the size of your thumb nail.

Sagartia elegans rosea. Lots of very pretty ‘elegant’ anemones settled in 2006. This one is about 30 mm across.

18 August 2006

Dead men’s fingers were common by late summer 2006 and nearly full grown (and more have settled). Watching *Scylla* helps us to understand how quickly different species grow to full size.

Beginning to look like what would be expected on a wreck: Plumose anemones on the propellor shaft.

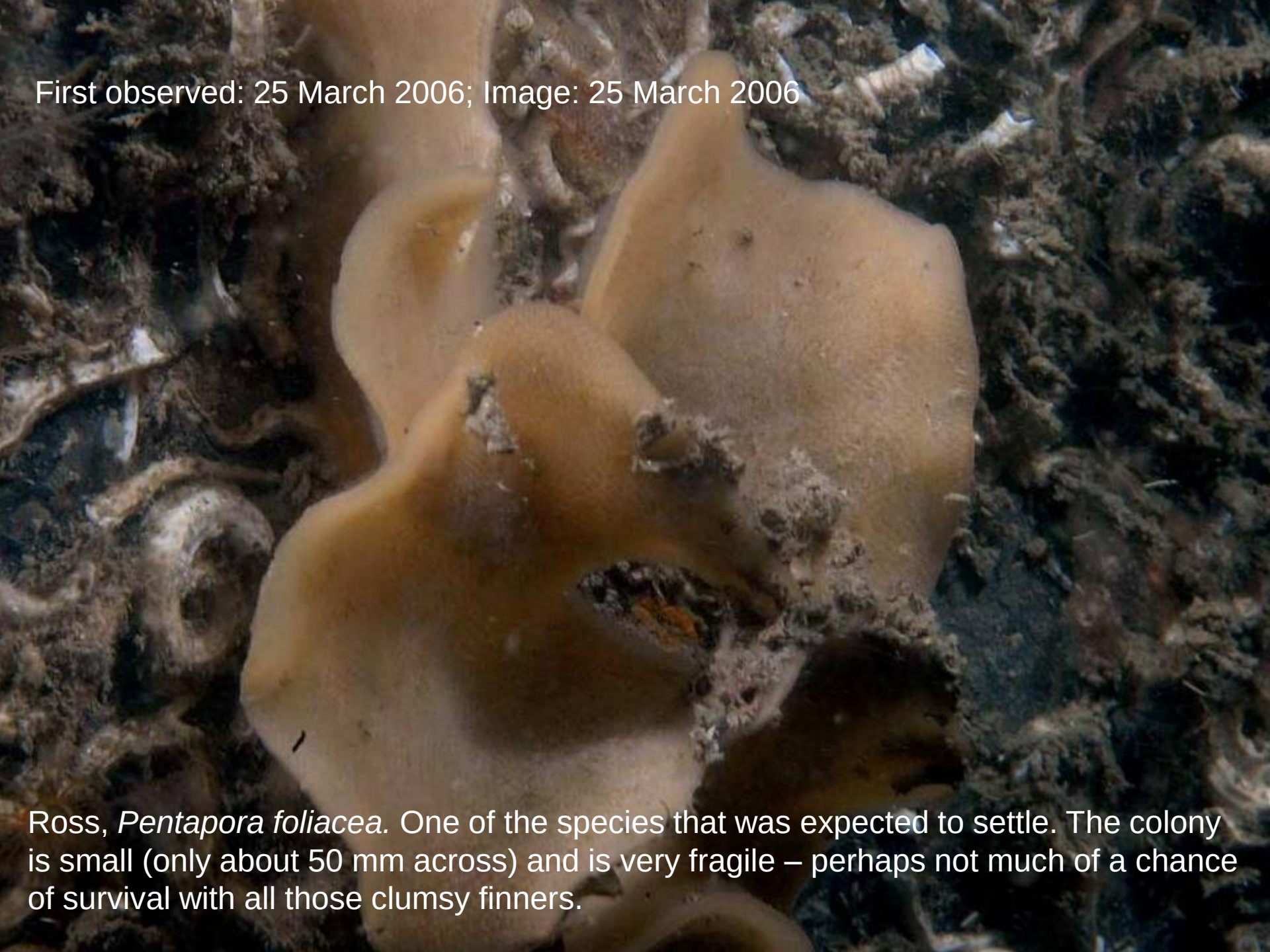
During the winter 2005-6 and into 2006, visually dominant species expanded and the reef communities began to stabilize.

1. Plumose anemones became abundant in some areas

2. Dead man's fingers became common and grew to full size

But still room for more – especially inside


28 January 2006
ESCAPE
Still plenty of room inside



First observed: 25 March 2006; Image: 25 March 2006

Ross, *Pentapora foliacea.* One of the species that was expected to settle. The colony is small (only about 50 mm across) and is very fragile – perhaps not much of a chance of survival with all those clumsy finners.

First observed: 28 January 2006; Image: 30 August 2006

Sea beard, a common species on wrecks but not seen until winter 05/06

10 July 2013

Sea beard, now a common species on *Scylla*, dominating some decks

First observed: 9 June 2006; Image: 18 August 2006

Top of the reef colonised by ‘expected’ variety of seaweeds including kelp

20 August 2006

Foredeck colonised by ‘expected’ variety of foliose seaweeds

20 August 2006

Lots more fish by end of summer 2006 – scad off the bow


20 August 2006
The scallops are back! (but not so many)

Many parts of the outside of the reefs are ‘solid’ with colonisation and a wide variety of species

Well, maybe. The tributyl tin antifouling paint (more than about 15 years since it was last applied when *Scylla* was sunk) is still remarkably effective. Such paint is greatly damaging to marine life and has been banned from use on small vessels since 1986. It is no longer used on RN vessels and has been banned from all vessels after 2008. (The black lines are ‘divers lines’ and are not treated – used for navigation during hull inspection.)

Topknot ‘braving’ the anti-fouling paint under the stern (and trying their best to mimic the colour).

By end of August 2006 (from our ‘Wanted’ list of spring 2005 & before ‘*Scylla* week’):

White sea fingers

Red sea fingers

Devonshire cup corals

Ross

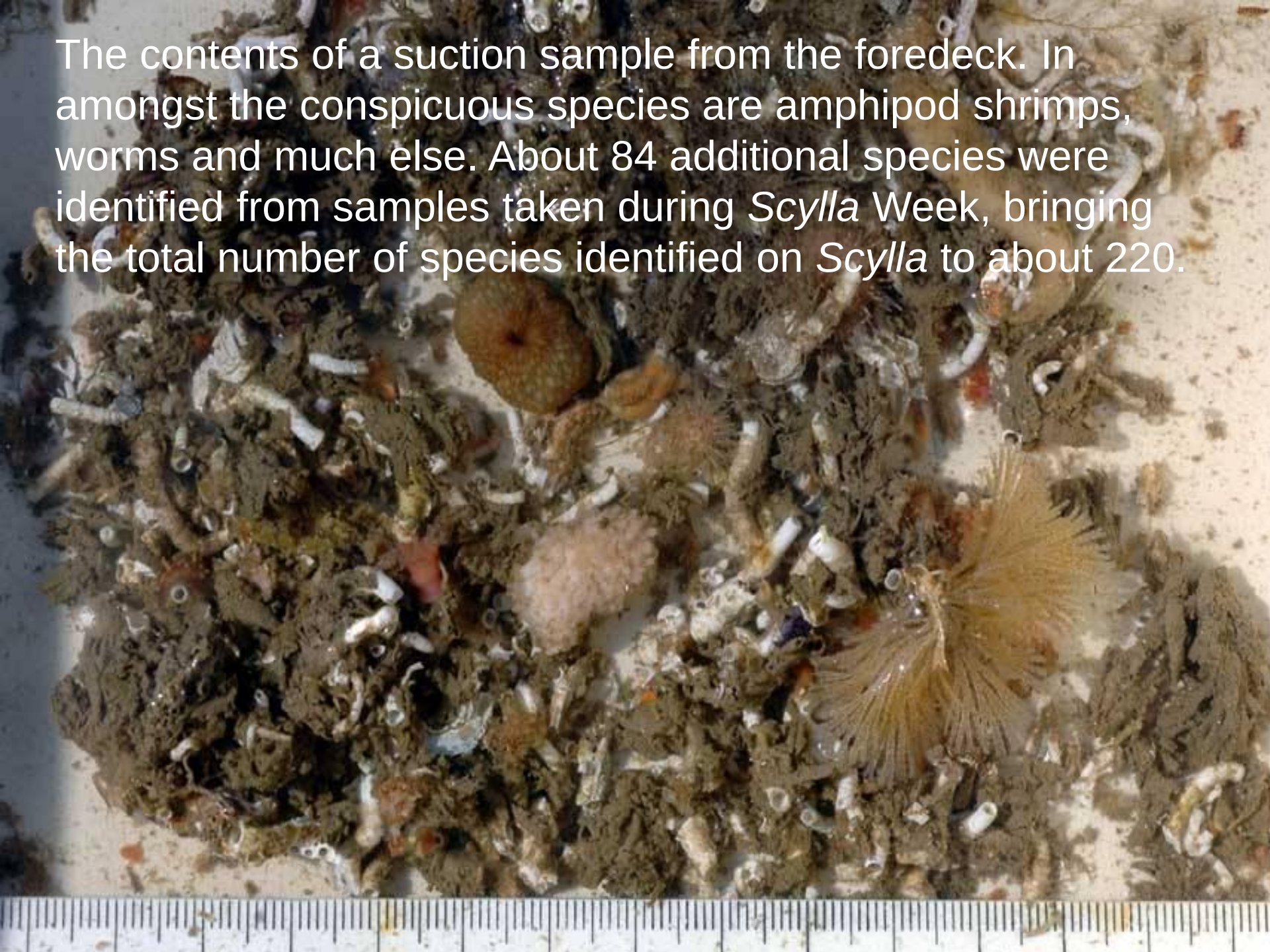
Edible sea urchin

Pink sea fan

126 species recorded from Scylla from observations and photographs

To discover what is living in the undergrowth and under the silt on horizontal surfaces, samples are needed. Here, an air-lift suction sampler that is used just like an underwater vacuum cleaner with the beasties being caught in a net inside the sample chamber.

30 August 2006 and during the subsequent *Scylla* Week



The contents of a suction sample from the foredeck. In amongst the conspicuous species are amphipod shrimps, worms and much else. About 84 additional species were identified from samples taken during *Scylla* Week, bringing the total number of species identified on *Scylla* to about 220.

By the end of 2006, most of the species that were to be visually dominant on the reef had settled.

But those species had to expand in abundance and grow in size before *Scylla* would qualify as hosting a ‘mature steel wreck community’.

And some ‘expected’ species were still unaccounted for.

First observed: 27 April 2007; Image: 27 April 2007

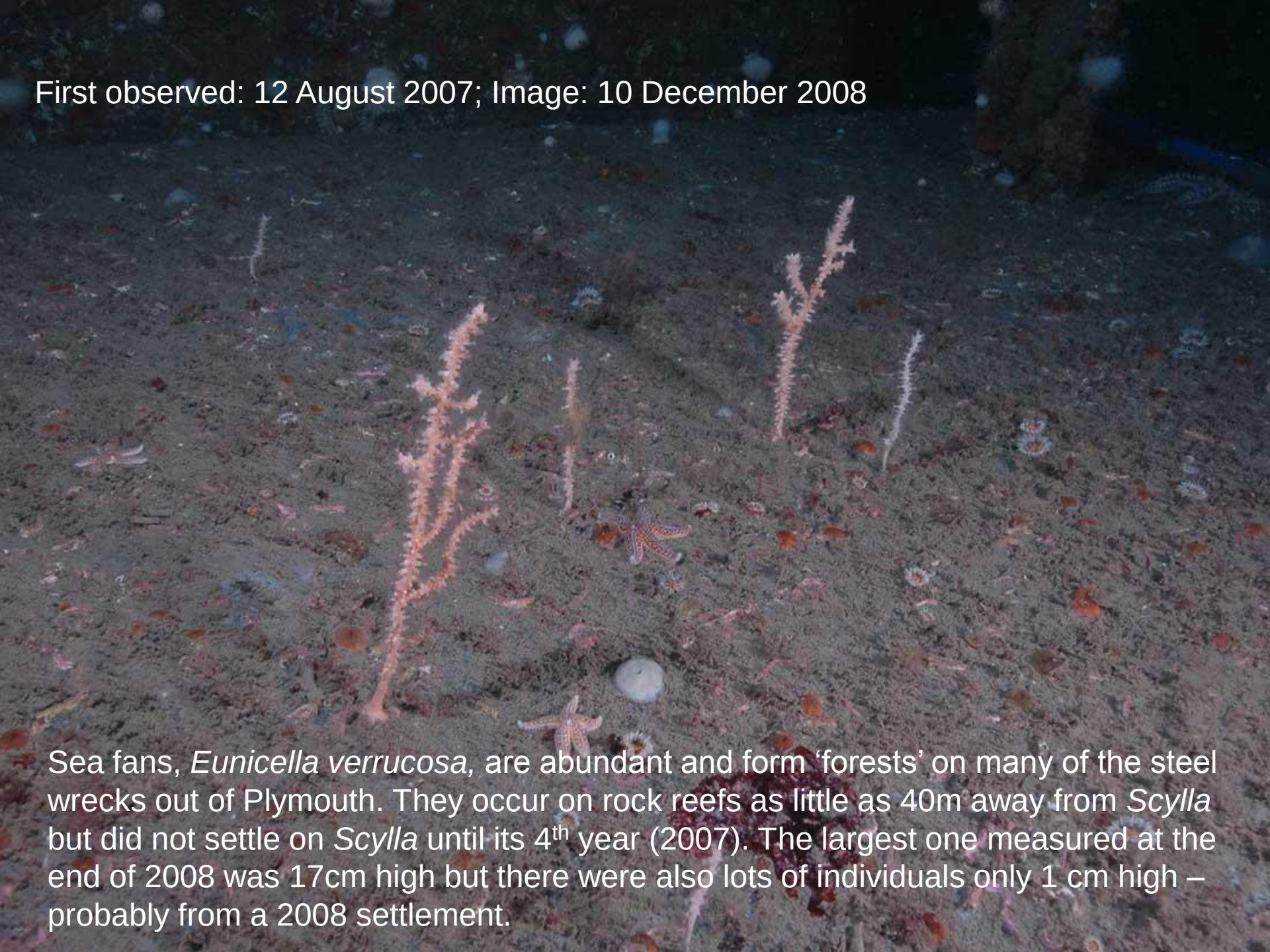
After some false sightings (there are brown dead man's fingers), red sea fingers, *Alcyonium glomeratum*, were first seen on 27th April 2007.

Orange pumice bryozoan, *Cellepora pumicosa* were first observed in summer 2006 and, unexpectedly, became extremely abundant in the next year.

By summer 2007, established species characteristic of wrecks were growing towards full size: dead man's fingers, ross and orange pumice bryozoans were abundant


First observed: 30 September 2007; Image: 19 September 2008
Sea urchins, *Echinus esculentus* were not reported from the reef until 30 September 2007 (often, small ones hide during day in crevices)

First observed: 12 August 2007; Image: 10 December 2008

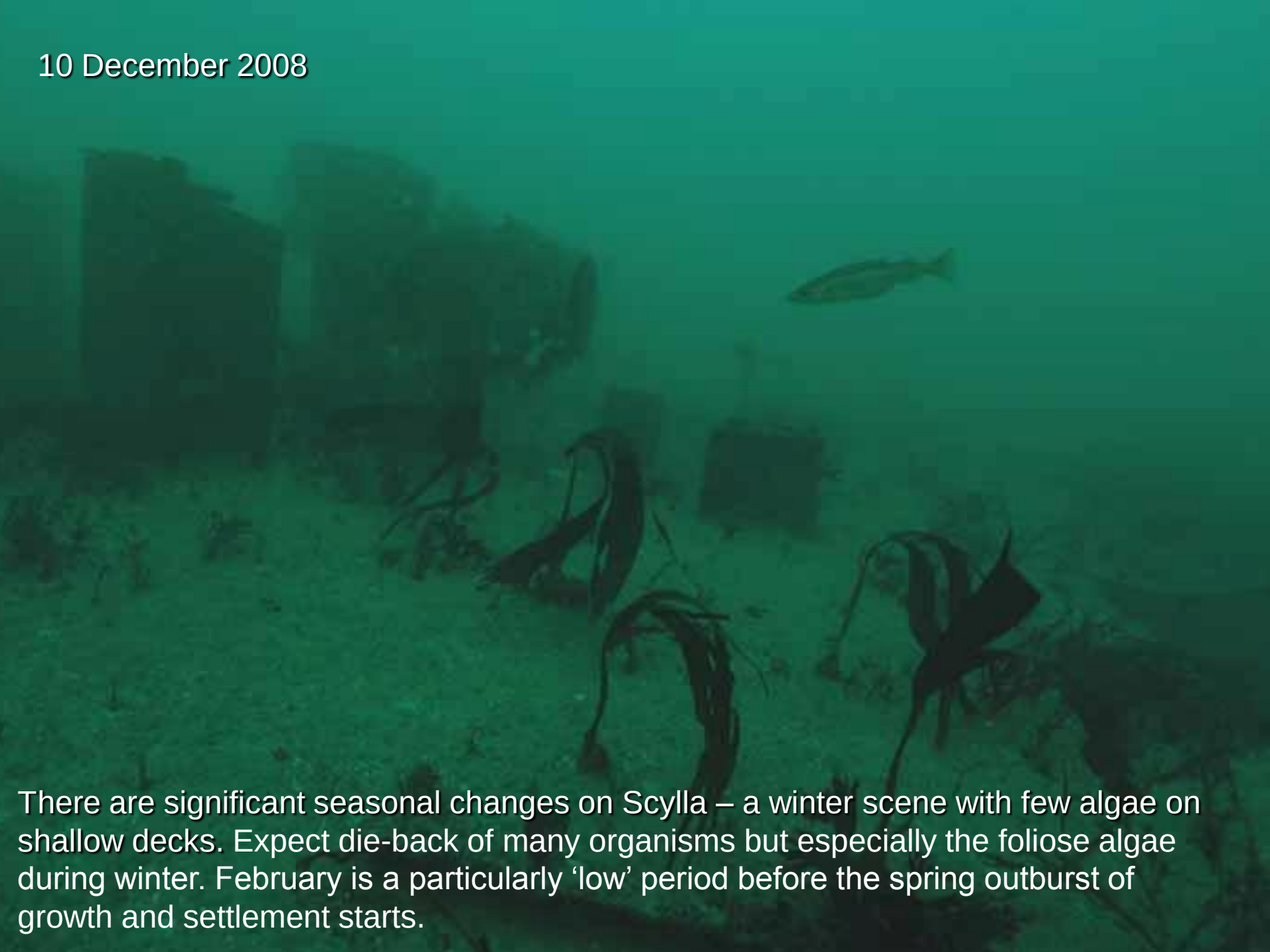


Sea fans, *Eunicella verrucosa,* are abundant and form ‘forests’ on many of the steel wrecks out of Plymouth. They occur on rock reefs as little as 40m away from *Scylla* but did not settle on *Scylla* until its 4th year (2007). The largest one measured at the end of 2008 was 17cm high but there were also lots of individuals only 1 cm high – probably from a 2008 settlement.

First observed: 25 September 2004; Image: 19 September 2008

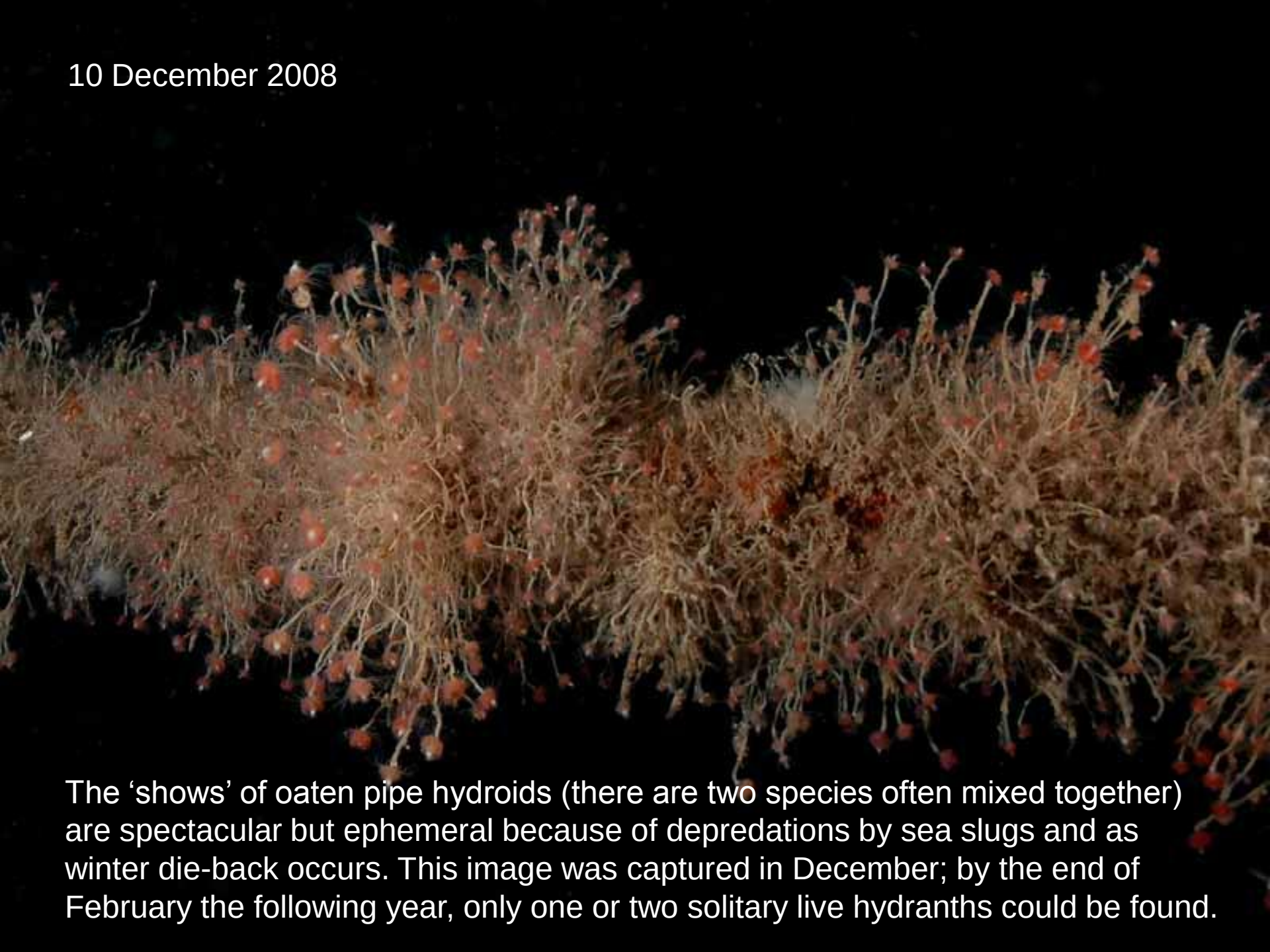
Feather stars, *Antedon bifida*, were first observed in September 2004 with many juveniles present in September 2007. However, they only became abundant as large individuals in 2008 and were particularly conspicuous inside the vessel on spars and on the gridded area of the helideck.

10 December 2008



There are significant seasonal changes on Scylla – a winter scene with few algae on shallow decks. Expect die-back of many organisms but especially the foliose algae during winter. February is a particularly ‘low’ period before the spring outburst of growth and settlement starts.

10 December 2008



The ‘shows’ of oaten pipe hydroids (there are two species often mixed together) are spectacular but ephemeral because of depredations by sea slugs and as winter die-back occurs. This image was captured in December; by the end of February the following year, only one or two solitary live hydranths could be found.


26 February 2009
Spring growth beginning – sea beech *Delesseria sanguinea*

By end of March 2009 (from our ‘Wanted’ list of spring 2005 and after ‘*Scylla* week’):

Dead man’s fingers

Red sea fingers

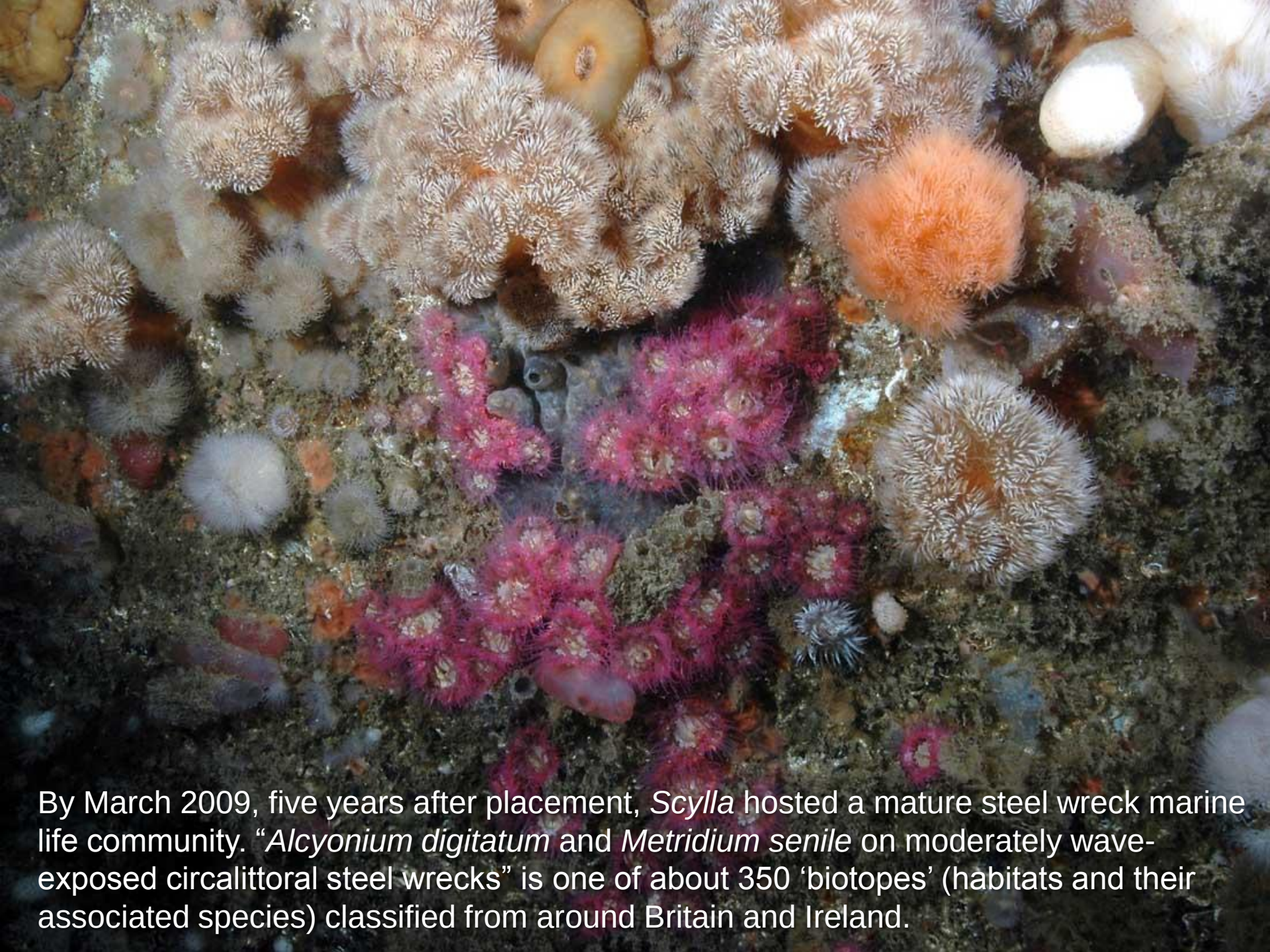
Devonshire cup corals

Ross

Edible sea urchin

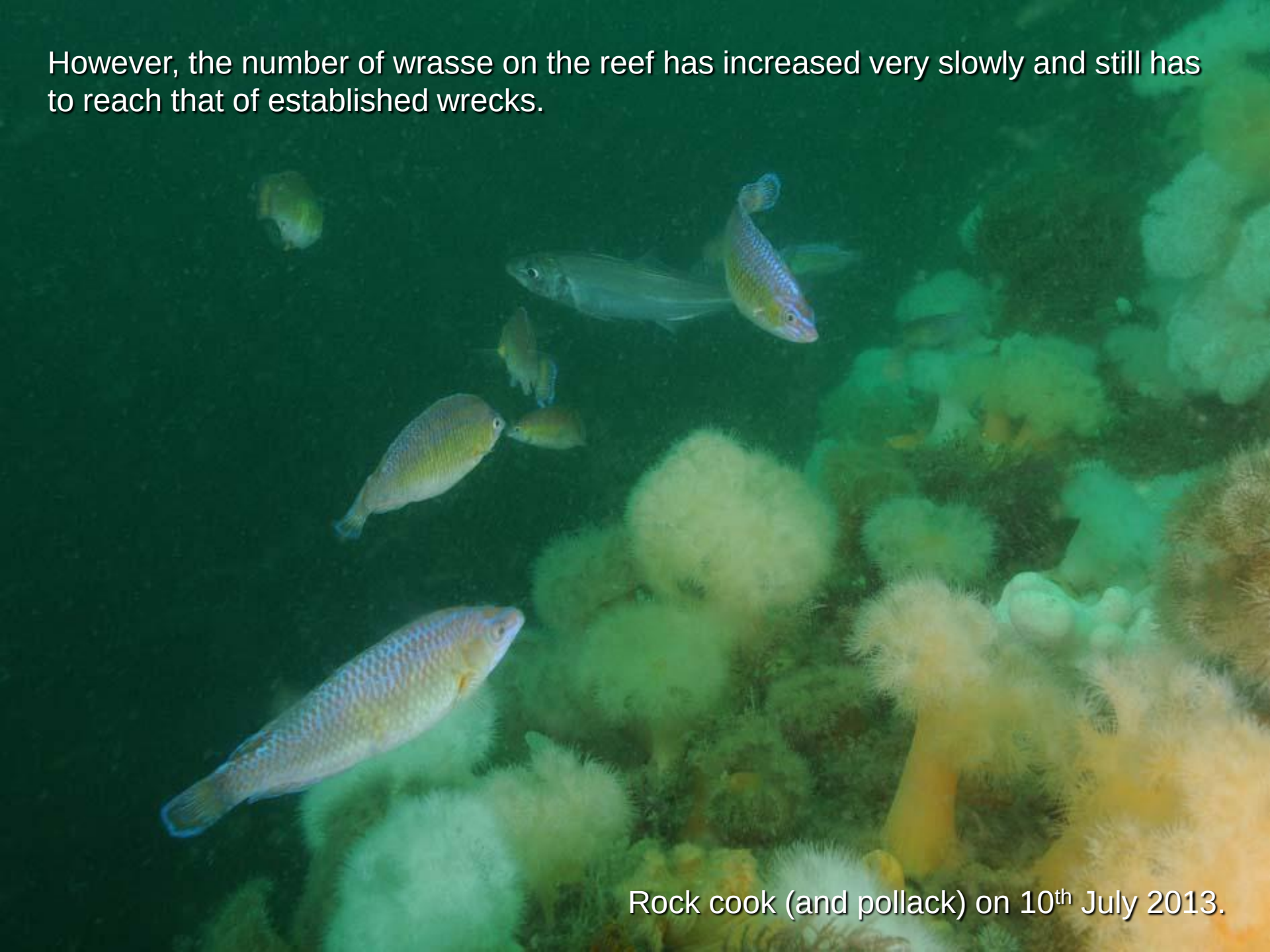
Pink sea fan

263 species recorded from Scylla from observations, photographs and samples



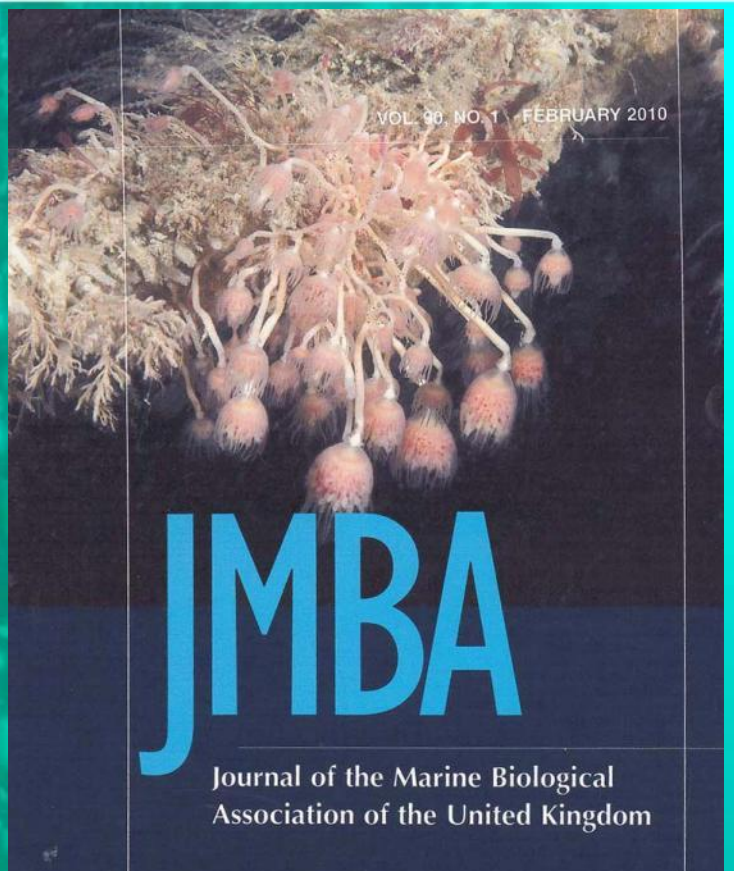
By March 2009, five years after placement, *Scylla* hosted a mature steel wreck marine life community. "*Alcyonium digitatum* and *Metridium senile* on moderately wave-exposed circalittoral steel wrecks" is one of about 350 'biotopes' (habitats and their associated species) classified from around Britain and Ireland.

However, the number of wrasse on the reef has increased very slowly and still has to reach that of established wrecks.



Rock cook (and pollack) on 10th July 2013.

It was now time to bring together records of colonisation and to publish the results (in February 2010).



Journal of the Marine Biological Association of the United Kingdom, 2010, 90(1), 69–94.
doi:10.1017/S0025315409991457

Colonization of an artificial reef in south-west England—ex-HMS 'Scylla'

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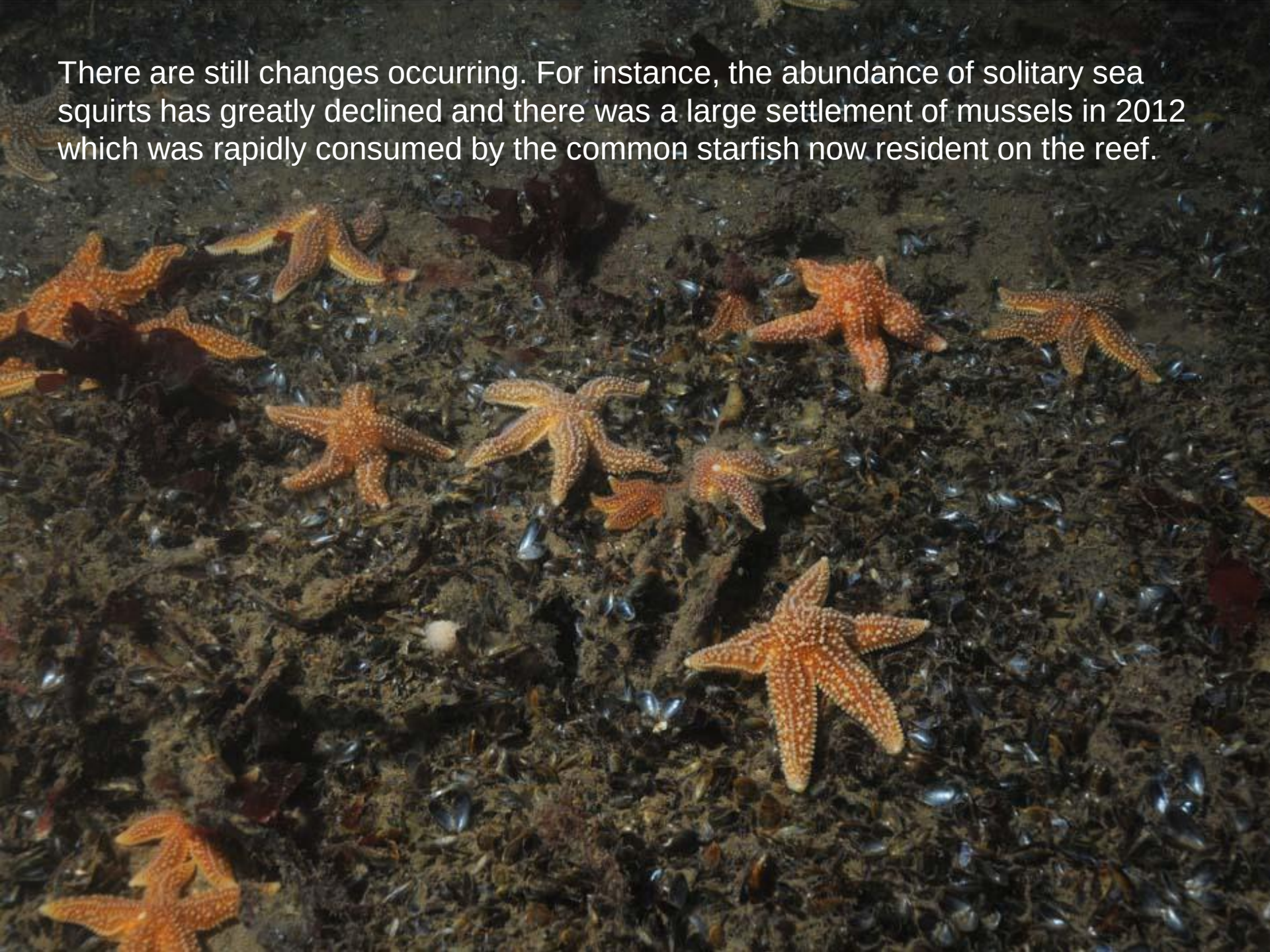
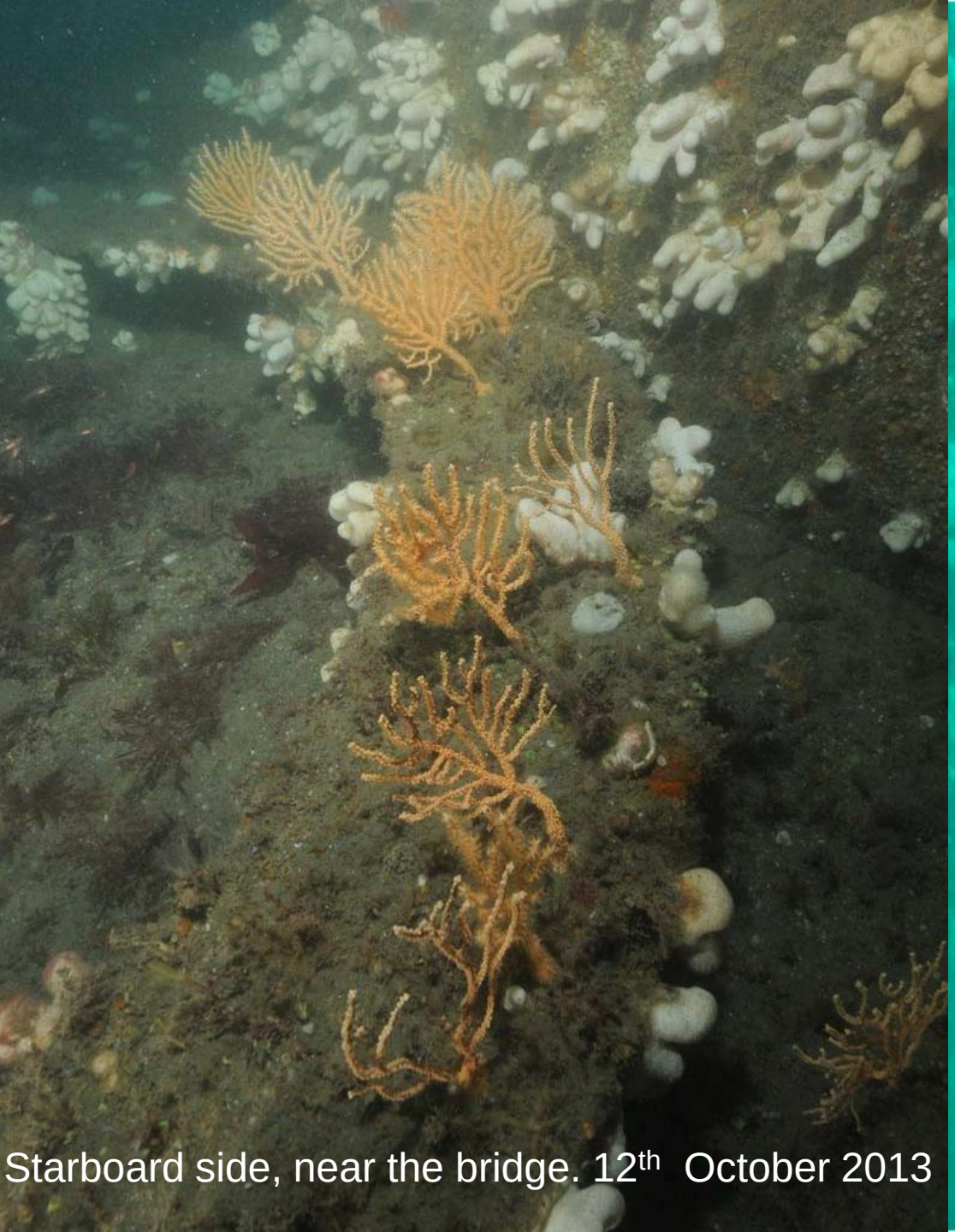


There are still changes occurring. For instance, the abundance of solitary sea squirts has greatly declined and there was a large settlement of mussels in 2012 which was rapidly consumed by the common starfish now resident on the reef.



Starboard side, near the bridge. 12th October 2013

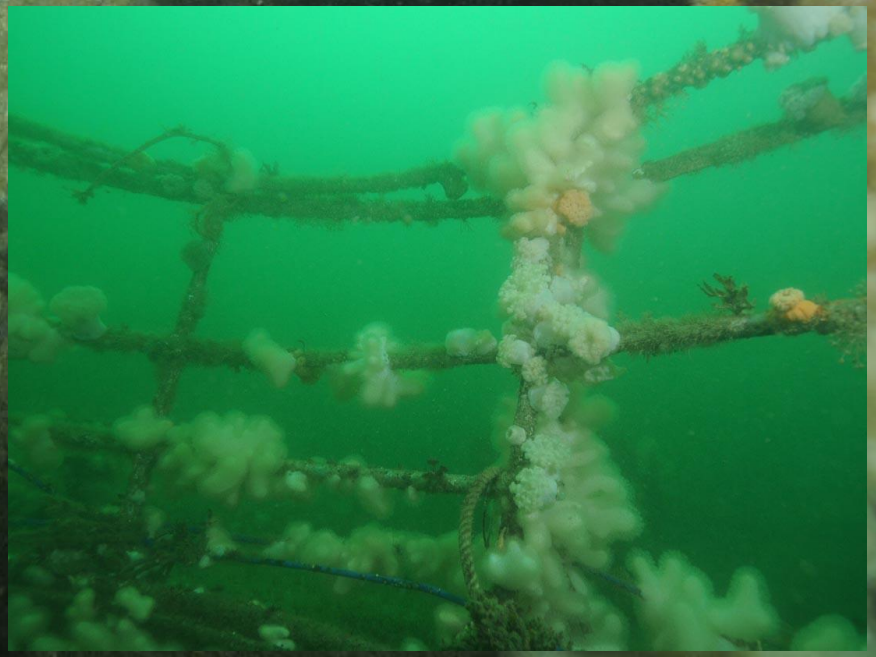
By the end of the summer of 2013, the plants and animals inhabiting *Scylla* were mostly those that had settled by the end of 2007 and the species count for the reef stood at 278.

After the winter storms of 2014: some loss of wildlife but most is ‘as always’

Starboard side, near the bridge.
12th October 2013

Starboard side, near the bridge.
23rd April 2014

After the winter storms of 2014: some damage especially inside but most is ‘as always’

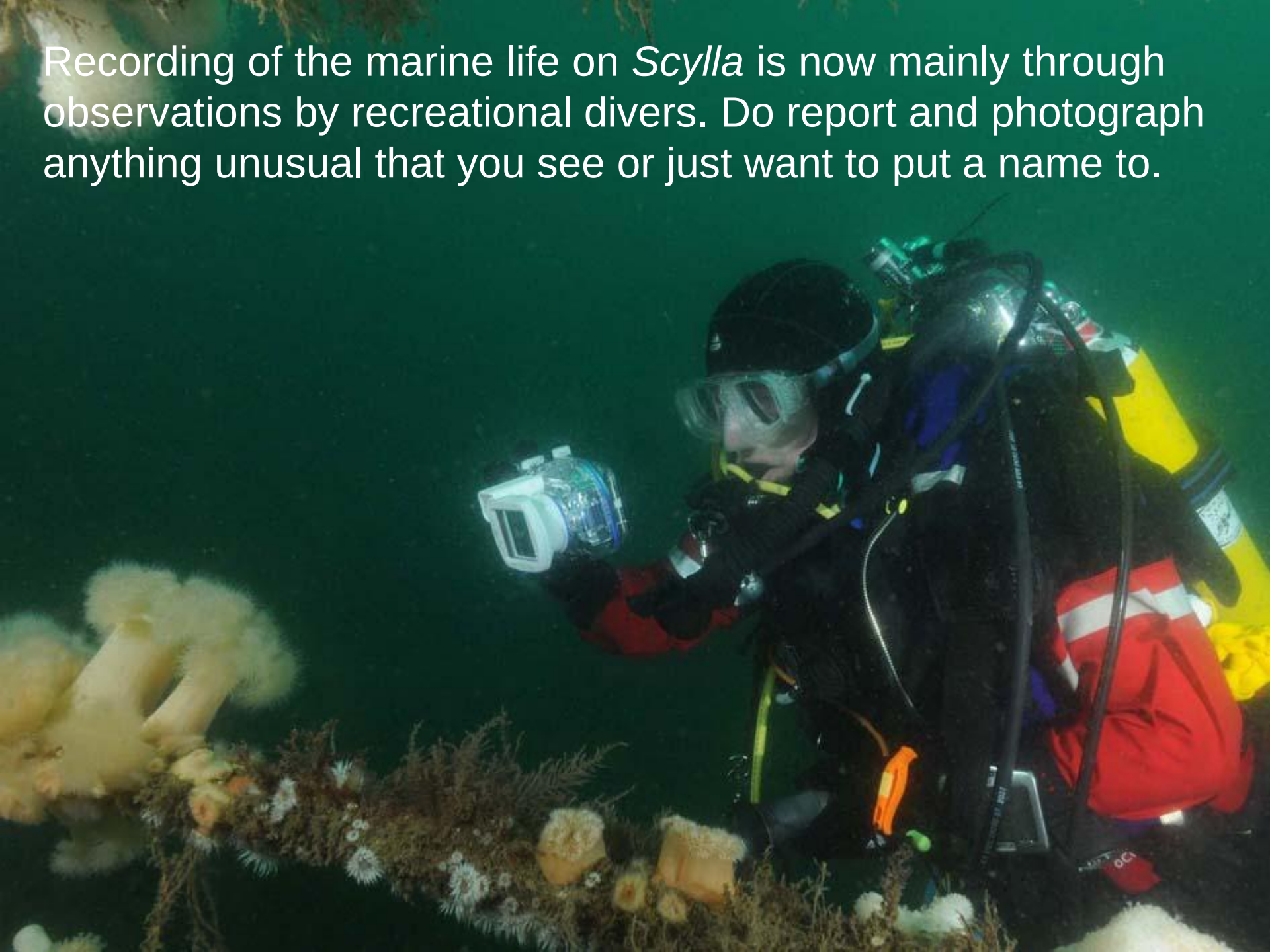


23rd April 2014


The future?
Plenty of life in the old girl yet but …….


Visit *Scylla*! *Scylla* continues to provide opportunities for excellent recreational diving on a reef smothered in marine life

Recording of the marine life on *Scylla* is now mainly through observations by recreational divers. Do report and photograph anything unusual that you see or just want to put a name to.



And, finally, enjoy *Scylla* but pay attention all divers (and fish):

Report any unusual or interesting marine life (supported by images where possible):

www.mba.ac.uk/recording

24 hr reporting hotline:

01752 633291

E-mail images to: recording@mba.ac.uk

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