



Rosehill  
Sea Fan Anemone  
Project

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2006 - 2012



Sea fan anemone *Amphianthus dohrnii* on the Rosehill



## 1. Introduction

In the spring of 2006 it was noted that several of the pink sea fans *Eunicella verrucosa* on the wreck of the Rosehill in Whitsand Bay to the west of Plymouth Sound had pink sea fan anemones *Amphianthus dohrnii* living on them. One particular fan was host to a considerable number and was also in a particularly convenient place to record and revisit. A photograph was taken of this fan and it was hoped that subsequent visits over the next few months would show how long the anemones remained and the effect on the sea fan. The anemones proved much more permanent than expected and hence the project extended over several years until 2012. The fan is still in place and further reference photographs will be taken whenever possible.

“The sea fan anemone lives almost exclusively on the two species of British sea fan though it has been known to occur on other rod-like living structures such as hydroid stems. There is no benefit to the host animal from this association but presumably the anemone benefits from being elevated above the seabed in the food-bearing currents.

This is a small anemone which rarely exceeds 10mm across the disk. The base is modified to wrap around the stem of the host and the whole body may be elongated along the same axis of the stem it is attached to. The tentacles are relatively short and may be up to 80 in number. The colour is buff to pale orange and the tentacles are translucent white. The sea fan anemone normally reproduces by basal laceration which often results in a number of individuals being found on a single host.

The anemone was understood to be quite common in the Western English Channel and southern Ireland in the 1920s and 1930s but is now rare. The species also occurs in south-western Europe and in the Mediterranean and appears to be declining throughout its range. There are related species which have a similar lifestyle in tropical waters.

Recent British records come from a number of sites near Plymouth and in the Manacles on the Lizard peninsular but even here less than 1% of the pink sea fans *Eunicella verrucosa* have anemones present.

They have also been seen on the northern sea fan *Swiftia pallida*, in the Firth of Lorn in western Scotland.

Because of the rarity of the species and its apparent decline it is one for which there is a Biodiversity Action Plan. This concentrates largely on increasing information about the species. Action taken to protect the pink sea fan or northern sea fan would also benefit the sea fan anemone.”

‘Seasearch Guide to Sea Anemones and Corals of Britain and Ireland’ author Chris Wood

In 2006 local Seasearch divers were not at all familiar with this anemone – in fact this was one of the first sightings for the author of this report. In subsequent years records have been more frequent and from much further afield. This is probably due to the fact that they have been ‘targeted’ and Seasearch divers are becoming better at recognizing and reporting them. They are classified as rare on the JNCC list of nationally rare and nationally scarce species.

The purpose of the recording project was simply to show how long the anemones remained in place and their effect on the host fan. The project has of course raised many more questions – an attempt to address some of these is made in section 4.

## **2. Finding sea fan anemones**

The wreck of the Rosehill sits on a mixed low lying rock and soft sediment bottom c 30m below sea level in the centre of a wide south facing bay. The upward facing plates of the wreck have extensive forests of pink sea fans, mainly in good condition and some very large. There are many fans with sea fan anemones attached. Often the first clue is a mass of silt on the fan and on closer inspection an anemone will be found although they can also be found ‘clean’. It is likely that they exude enough sticky slime to attract silt over time.

Their camouflage is perfect for living on the pink sea fan but there seems no reason why they could not attach to other upright hydroids or sponges since they do not appear to have many predators – but although a few reports of anemones on hydroids exist it is a rare occurrence.

They tend to attach towards the upper part of a fan thus taking full advantage of the current and any food it might bring.

Although on this wreck they are fairly common they are rare at other regularly dived local sites. This may be because conditions here are near perfect. The currents circulate clockwise gently round the bay and the wreck sits more or less in the centre, away from any strong current. It can be dived at any state of the tide. The wreck plates are at a depth of about 24 – 26m below chart datum, usually below any surge or swell and it is on these upward facing plates that the fans with anemones are found. Fans on the upper sections such as the boilers are devoid of anemones.

### **3. The target fan**

The target fan was recorded by photograph on as many occasions as possible from July of 2006 through to November of 2012. The fan sits on a horizontal plate at the stern of the wreck and can easily be found by heading west from the boilers past the propeller shaft. A Seasearch tag was attached to the metal nearby to aid identification and a photographer can gain clear access from the edge of the plate on the north side of the fan.

Originally the fan was a fairly rounded shape with many anemones concentrated mainly towards the top. The lower part of the fan was and has remained virtually anemone free. As can be seen from the original photograph no1 there is a large amount of silt around the anemones which in places has attracted turf growth and it may well be that part of the upper section of fan has already disappeared at this stage.

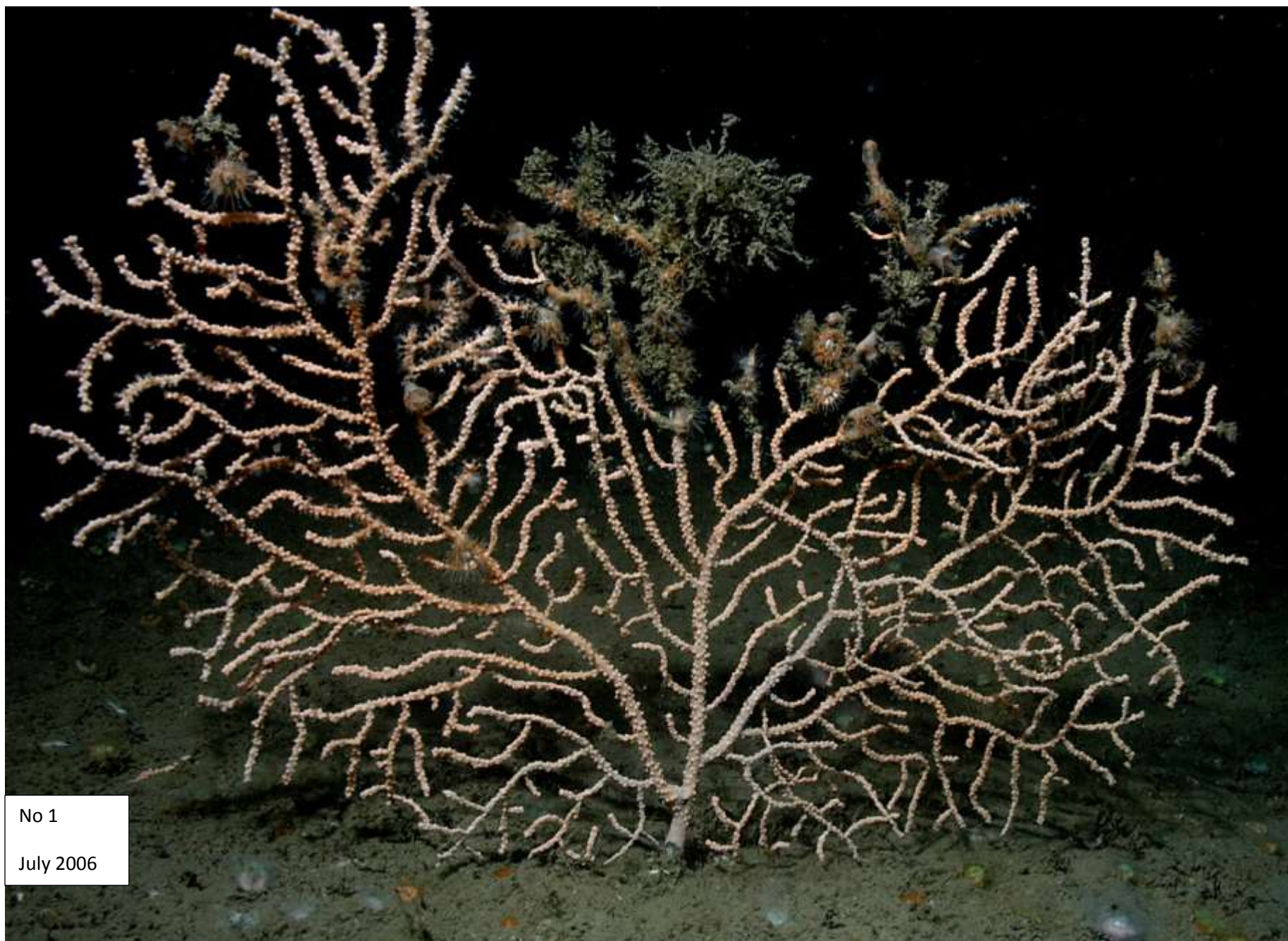
There follows a series of photographs in chronological order with approximate anemone counts and comments. All photographs were taken from the north side of the fan (looking south).

## **Photograph 1**

This first full photograph in July 2006 shows a reasonably healthy sea fan with polyps retracted. There are at least 37 sea fan anemones, several of them in clusters. Most have a degree of silt around them, some a large amount and there is unidentified turf especially on the upper centre of the fan. The lowest anemone is attached just over halfway down the fan.

The fan is approximately 25cm high by 30cm wide at this stage.





No 1

July 2006

## **Photograph 2**

Four months later in November 2006, the fan showed at least four new anemones (or anemones which had moved to new positions) and two sections broken off. Once again the fan had most of the polyps retracted but apart from where the anemones and associated silt and turf were attached the fan appeared reasonably robust and healthy.





No 2

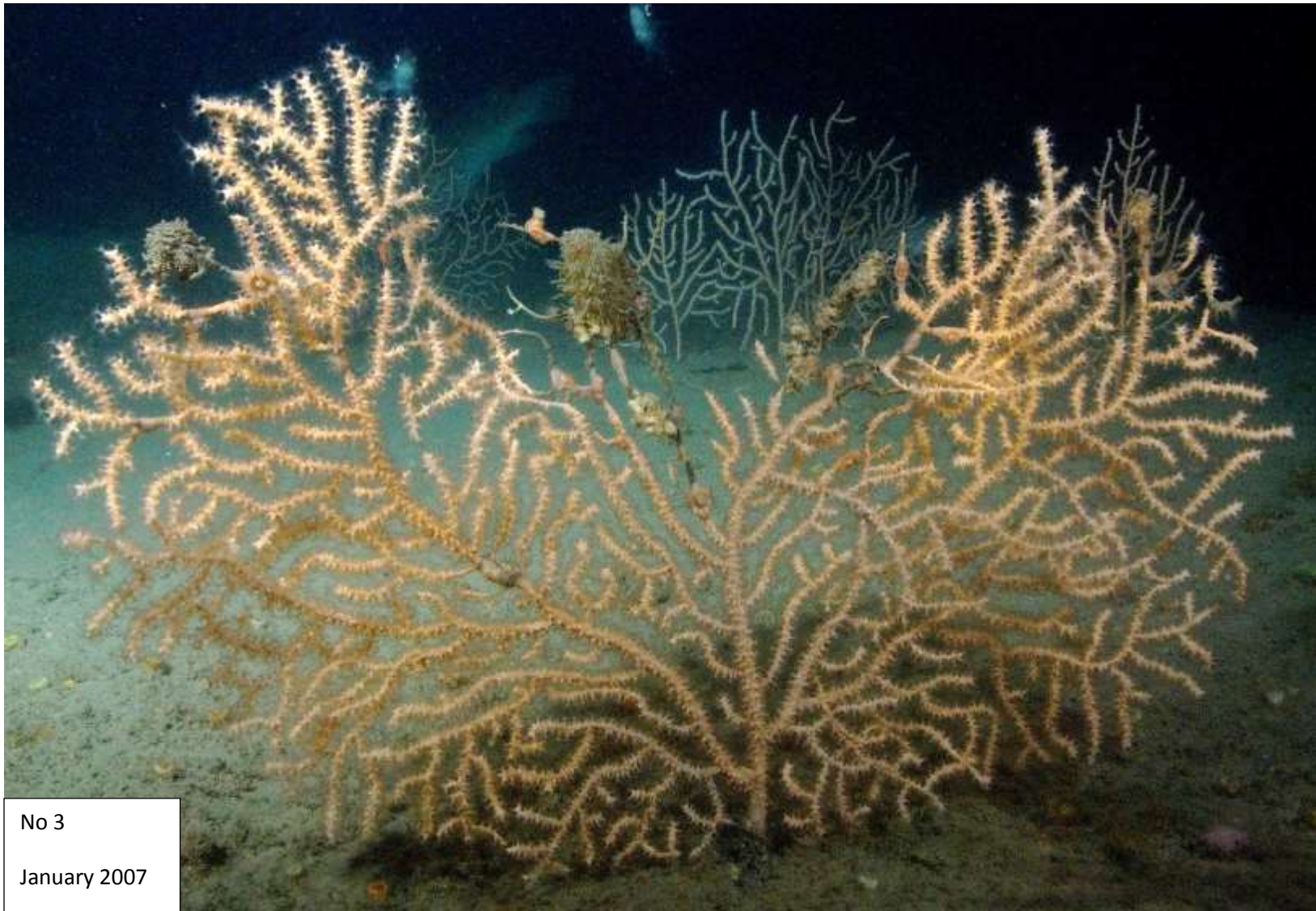
November 2006



### **Photograph 3**

By January 2007 the fan had lost much of the silt covered turf – probably due to the winter temperature.

On this day the polyps were extended and the fan looked in good overall health. At least 18 anemones can be counted. There has been a small amount of dieback just to the left of the upper centre.



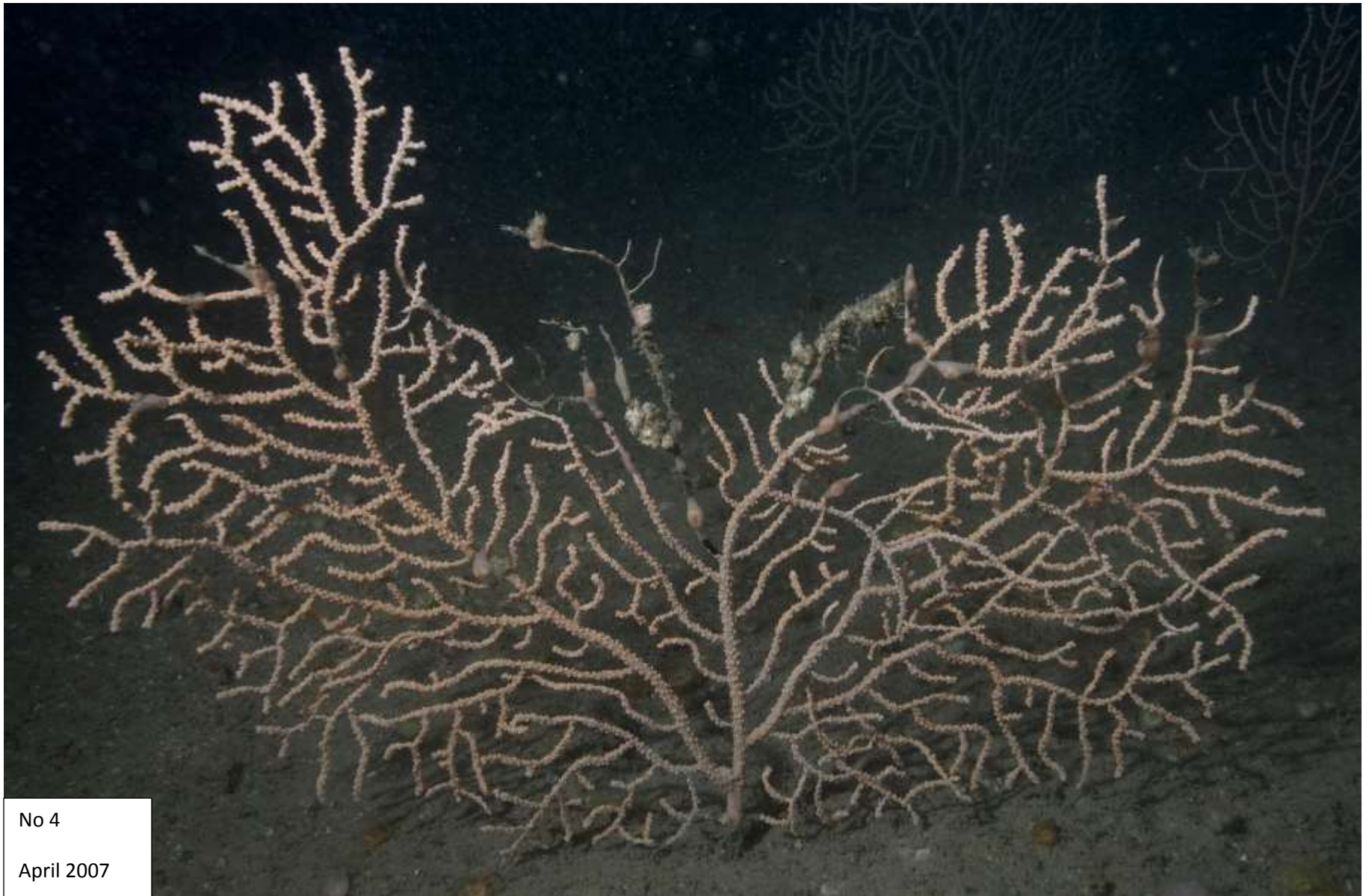
No 3

January 2007

#### **Photograph 4**

By April 2007 the fan was looking 'cleaner' (possibly due to the time of year) but with considerable die back on the upper left and centre sections and a small amount on the upper right. A distinct V shape was beginning to appear. The polyps were retracted and many of the anemones appeared to be partly closed but the number appeared to have increased to at least 22. There was also one sea fan nudibranch *Tritonia nilsodnheri* recorded.





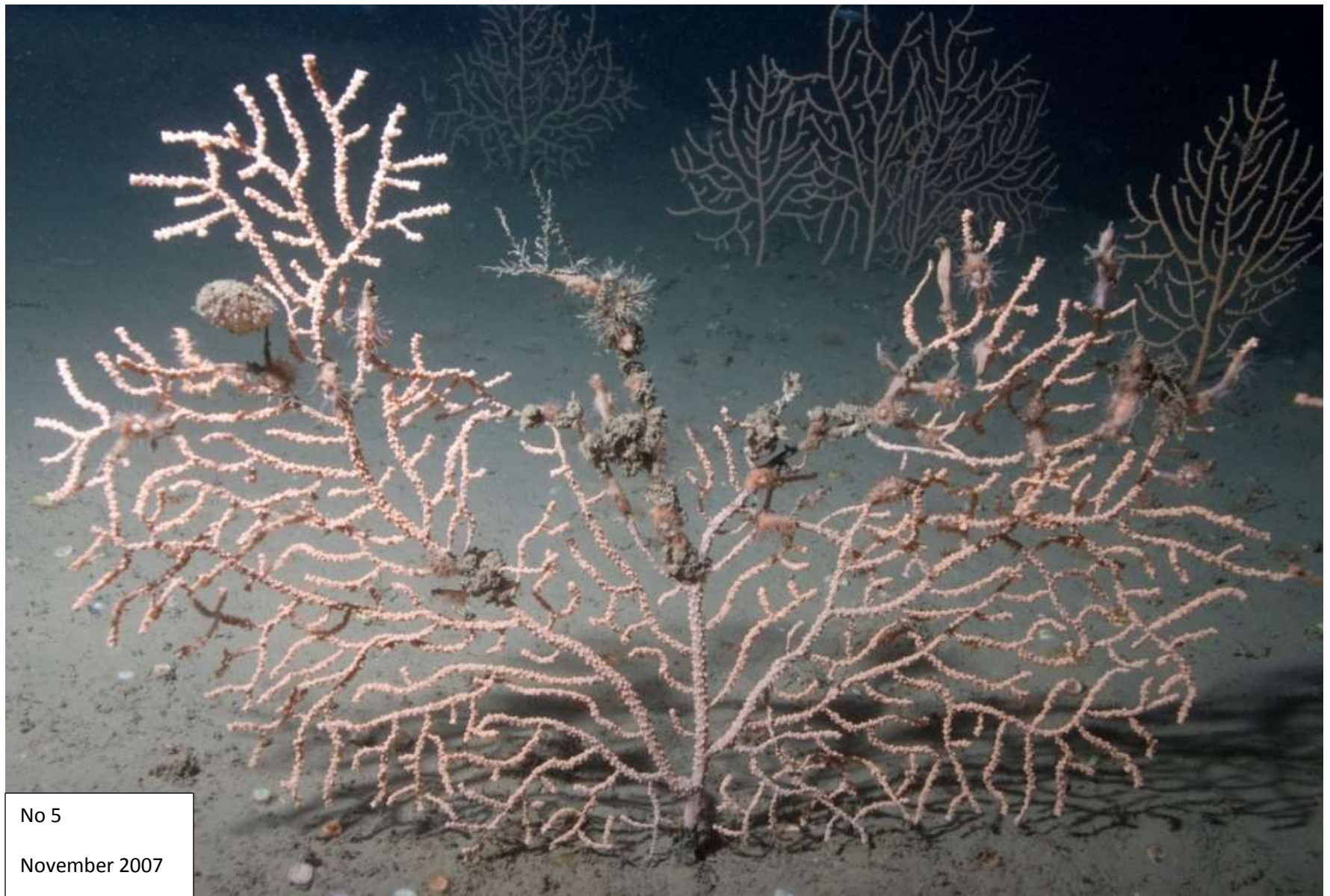
No 4

April 2007



## **Photograph 5**

By November 2007 silt was more evident and the anemone count had increased to 35 with a large number on the right hand side. The polyps were retracted and the fan did not appear to have lost any more branches - it had actually grown by about a centimeter on several of the branches.



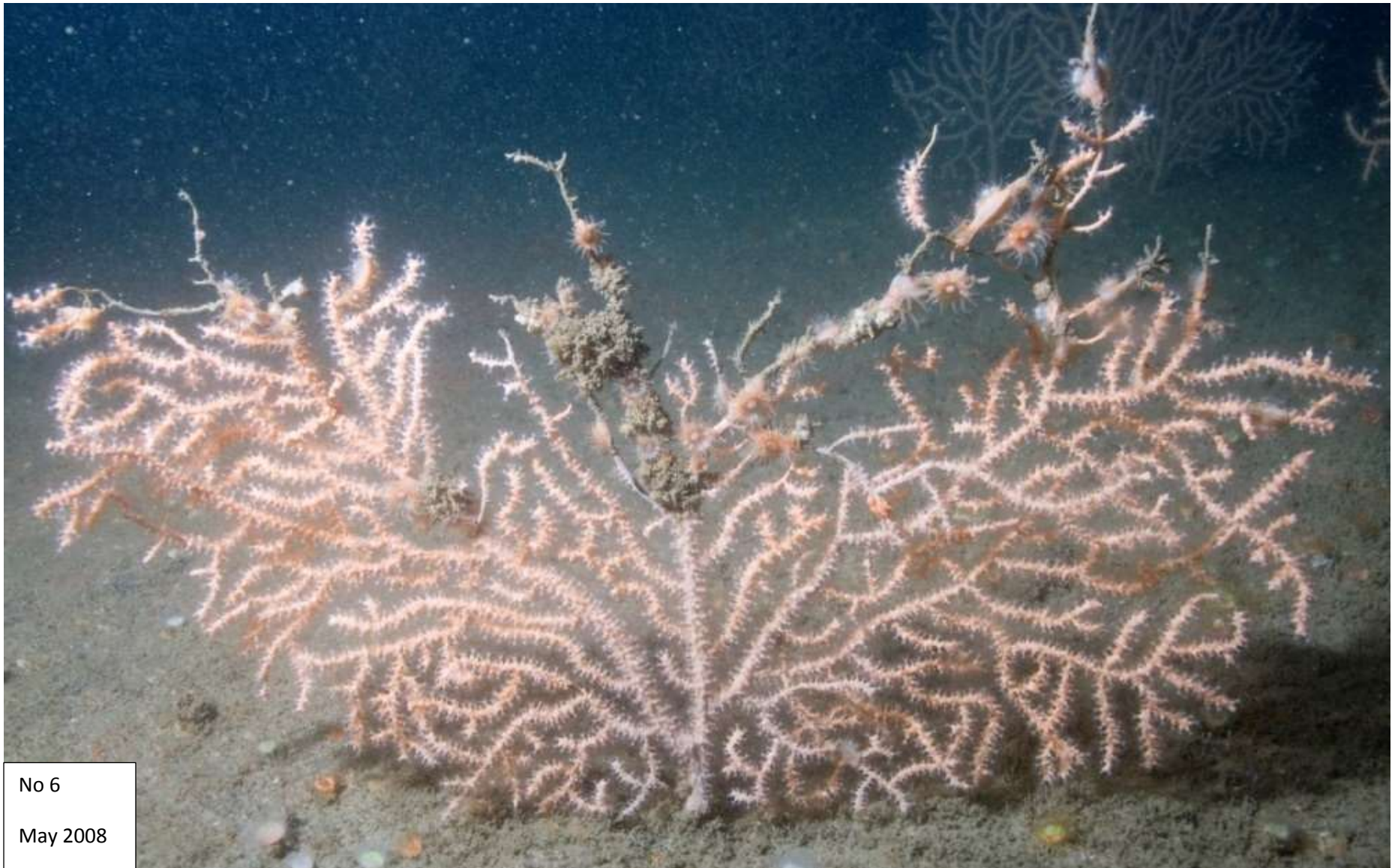
No 5

November 2007

## **Photograph 6**

By May 2008 a large section on the upper left had disappeared, changing the overall shape dramatically. The fan now had a fairly level top. The polyps were out and the remaining fan still appeared healthy. The photograph shows 33 anemones, many of them clean and free of any silt.





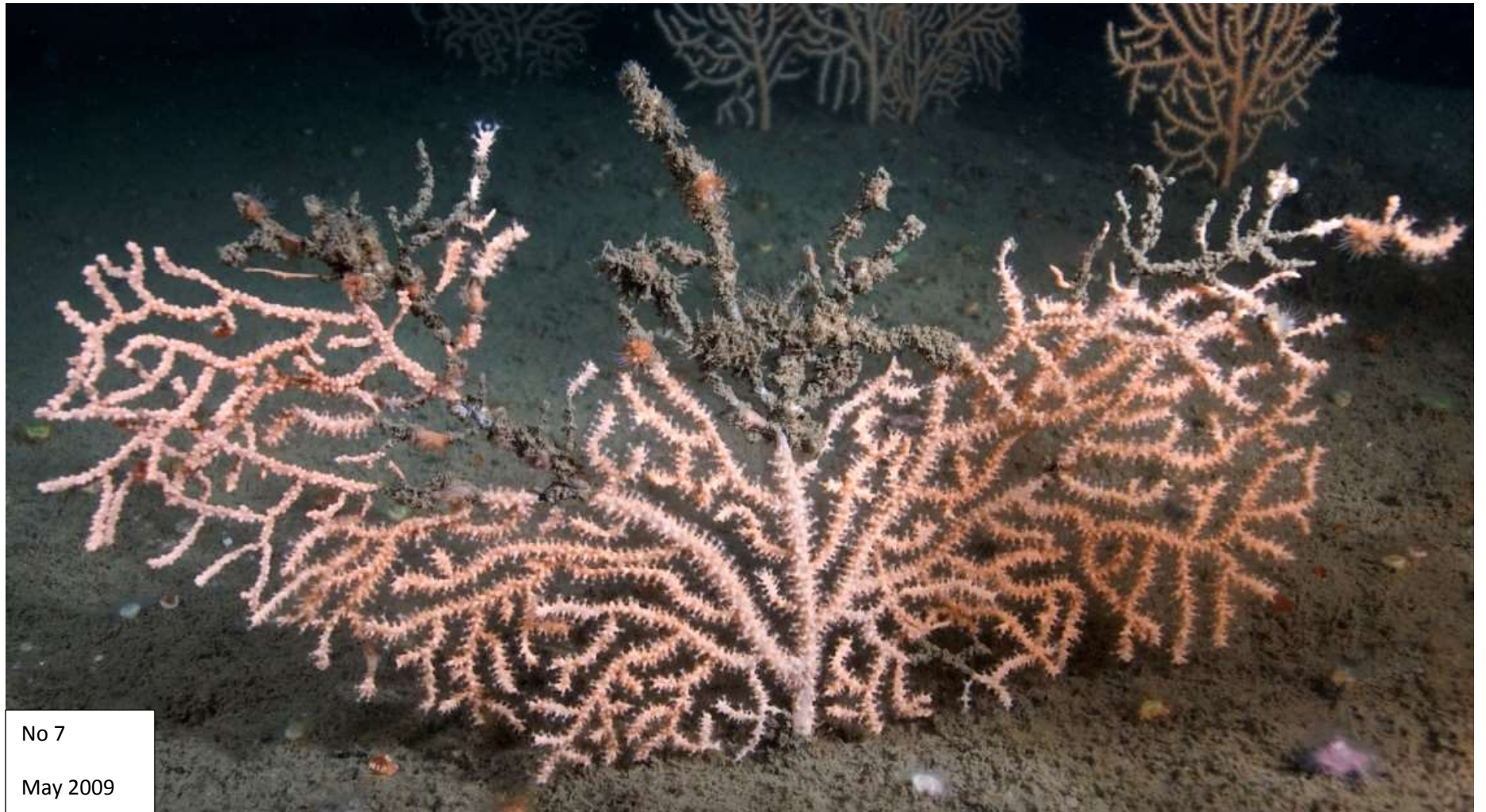
No 6

May 2008



## **Photograph 7**

It was a full year before the fan was photographed again in May 2009. One complete branch on the upper right had disappeared, presumably taking a number of anemones with it but the rest of the fan was largely unchanged although it was considerably more silted. Some of the polyps were out and 13 anemones were counted.



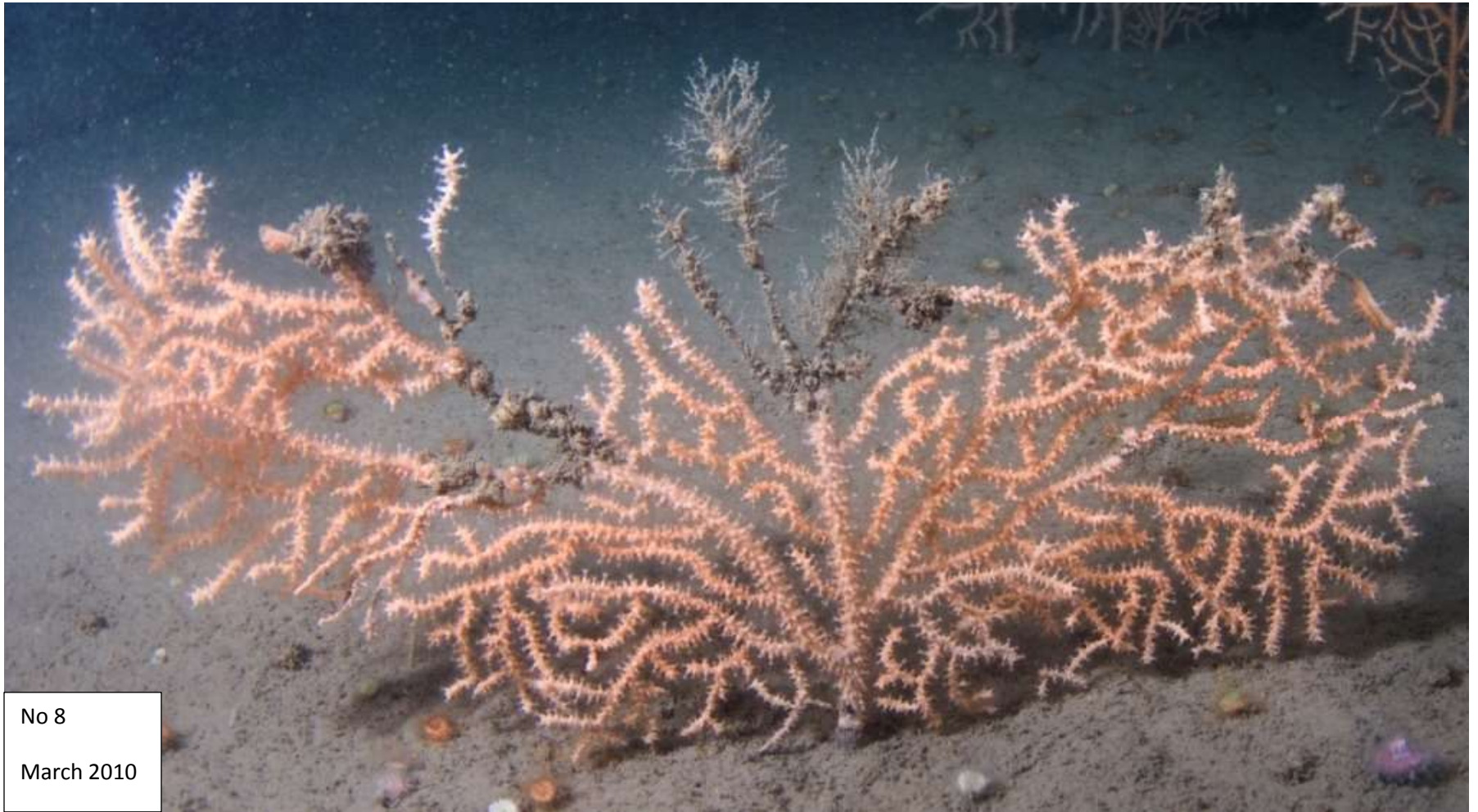
No 7

May 2009

## **Photograph 8**

By March 2010 more of the upper right, centre and upper left had gone. Just 7 anemones can be counted from the photograph. The fan has very much been reshaped from the start of the project although the remaining growth looks reasonably healthy with the polyps out and feeding.





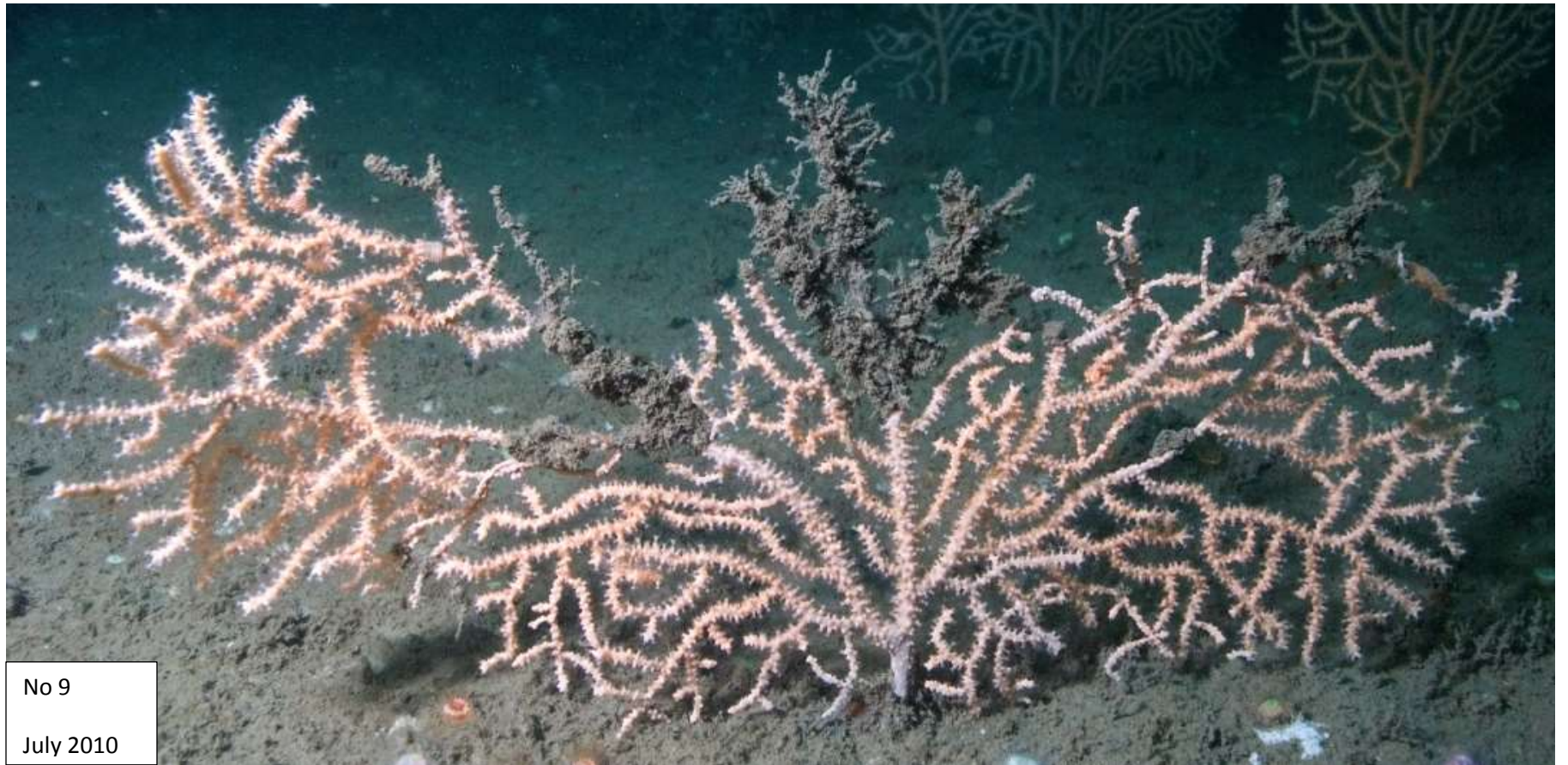
No 8

March 2010



## **Photograph 9**

By July 2010 there was a large amount of silt around the centre dead section and few anemones overall. Only 3 can be clearly counted on the photograph. There are some nudibranch eggs but no actual nudibranchs can be seen. The fan polyps are out on the left hand side but that section appears to have a weak completely dead and fouled connection to the main fan.



No 9

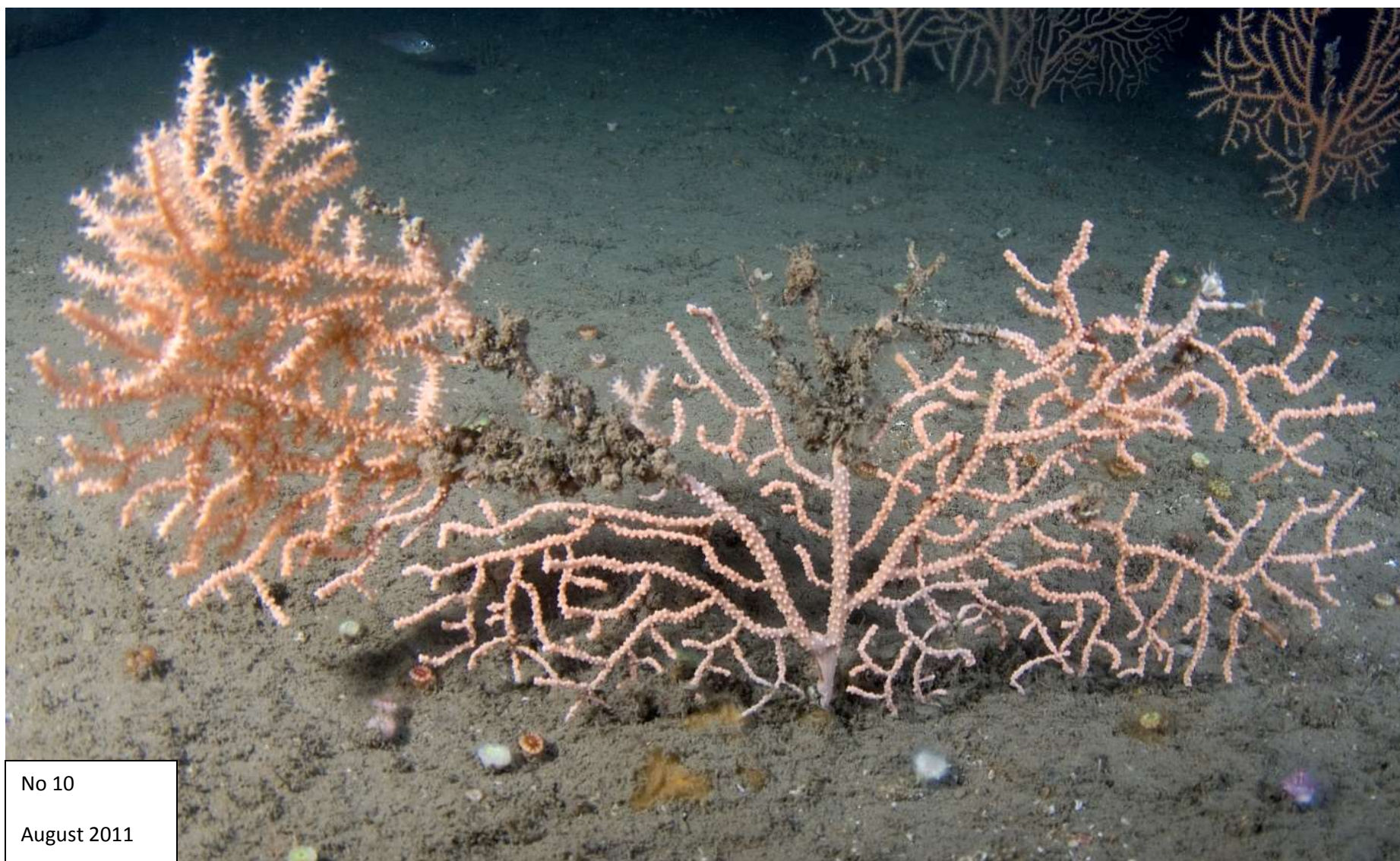
July 2010

## **Photograph 10**

August 2011 and the left hand side was flourishing, albeit on a very encrusted and weak looking connection to the main fan. The height had been increased by several new upward growing shoots although the sideways growth appeared static. The right hand side also appeared to have recovered a little but the centre had lost a little height. Only one anemone could be clearly seen on the extreme right hand top side although silt conglomerations may have obscured others.

Interestingly the polyps were out fully on left hand side but mostly retracted on the lower parts and the right hand side. It is unusual for sections of a fan to be behaving so differently and could be due to lack of connective tissue between the sections - thus the left hand section behaving as an independent fan.





No 10

August 2011

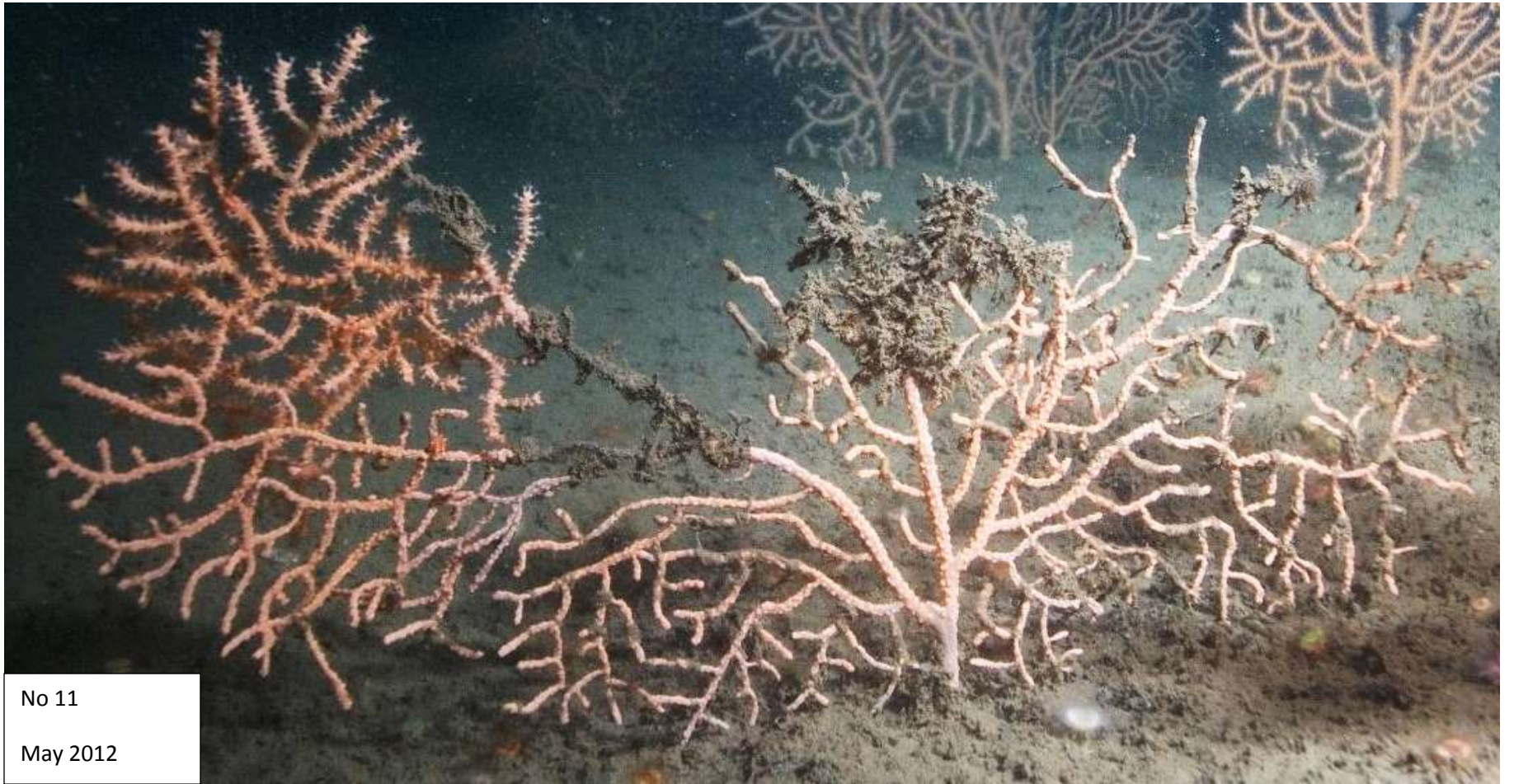


## **Photograph 11**

The final photo in May 2012 shows a very weakened, lopsided fan with a section on the left looking very vulnerable, attached to the main fan by a weak, dead looking connection. There is still some silt fouling in places but although a close look at the photograph shows three or possibly four sea fan nudibranchs there do not appear to be any sea fan anemones at all.

The fan has reduced in height by about half in the centre over the period of 6 years although the left hand side has reduced by less and has actually regrown upwards. It is now approximately 12cm high in the centre but up to 20cm high on the left hand side. The width has increased to approximately 34cm.

It remains to be seen if the fan will lose the tenuously connected left hand side and also how it will regenerate in the future.



No 11

May 2012

## 4. Conclusions

### **The effect on the sea fan**

The photo series clearly shows that the anemones spread along the branch appearing to reproduce by basal laceration, smothering the sea fan polyps and the membrane that covers the skeleton thus killing the live tissue of the sea fan. Eventually they can weaken the fan structure enough that parts fall away. This could be accentuated by the weight of silt and turf attracted. The target fan was reasonably full and rounded to start with but is now a lower, oblong shape, having lost most of the upper sections and with one section only barely attached.

Lower sections where there were no anemones appear to still flourish and the entire fan may well regenerate over time.

Perhaps in view of the damage they cause the host sea fan it is as well that sea fan anemones are rare.

The anemones here have been observed over 6 years but whether they are the same anemones or offspring of the originals is unknown. It is also impossible to know where the anemones that have disappeared have gone – predation (by what?) or drifted off to another sea fan are two possibilities or they may simply have come to the end of their life span.

### **Why are they so localised?**

The anemone reproduces in situ by basal laceration giving rise to aggregations of varying numbers. It is likely there is also a planktonic stage since the anemone is recorded at widespread locations, albeit found only occasionally. Stephenson (1939) states 'Breeding: laceration..... and at other times'.

The area around the Rosehill has slight currents (such that the site can be dived at any state of the tide) so any planktonic stage may not spread far. There are also a large number of fans close together thus enabling it to easily find a suitable settling out site. These facts may indicate why sea fan anemones can always be recorded

at this site making it an important 'hot spot'. The anemones are also found in reasonable numbers on the sea fans on the surrounding reefs.

Other wrecks off Plymouth do have a similar concentration of sea fans but few or no records of sea fan anemones. There are none recorded on the wreck of the James Eagan Layne which lies approximately 4 km to the east of the Rosehill within Whitsand Bay despite that wreck having a large number of healthy fans. Possibly most of the fans there are too shallow and/or affected by swell and it could be that the currents are slightly stronger at this end of the bay. The nearest wreck is the Scylla which does now have a population of young sea fans but as yet no sea fan anemones recorded.

As a comparison the wreck of the Persier lies at the centre of Bigbury Bay to the east of Plymouth – again a wide, south facing bay but with stronger tidal streams. The Persier has extensive forests of pink sea fans on upward facing metal plates, very similar to the Rosehill but the sea fan anemone is only rarely recorded here and does seem to be ephemeral. The South Devon Reefs Report of 2003 shows only one record of the anemone on the Persier. The next record is from 2007 when several were recorded on fans near the prop shaft (see photo). Anemones were recorded from this area again in 2008 and 2009 (on at least 10 fans) - personal records from Keith Hiscock and the author. There have been no subsequent records from this area and apparently no recent records from elsewhere on the Persier. Conditions on this wreck may not be as conducive to reproduction.



*Amphianthus dohrnii* on the Persier



There are populations on certain of the reefs out of Plymouth although the exact position of these anemones is much harder to determine and re-record.

They are recorded regularly on various sites on the Plymouth Drop Off from 1999 to 2012 with abundances from Rare to Frequent on the SACFOR scale. Depths here will be from 27 to 40m+ below chart datum, considerably deeper than the previously mentioned wrecks and less subject to swell or tidal streams at this depth. There does appear to be a permanent population in this area.

They are recorded regularly but usually as Rare on sites at Hatt Rock, again from deeper dives and an indistinct ROV video appears to show them frequent at 40-50m although it is difficult to be sure.

They are recorded rarely from Hand Deeps where the dives are usually shallower than Hatt Rock and again rarely from sites around the Eddystone.

Inshore they are recorded rarely from sites in the Hilsea area.

From Blackstone Point Reef (to the west of Hilsea Point) records show them fairly consistently, albeit as Rare, from 2004 to 2008 but there appear to be no records since. There are very occasional records from other reef sites out of Plymouth over the years but no obvious permanent population.

Sheltered sites with large, healthy populations of sea fans in shallow water such as the Breakwater Fort have no records of sea fan anemones.

From all of the above it would appear that they prefer at least 20m depth and preferably 30m plus. One Seasearch record from the wreck of the Slaatero (Penzance) gives them as Common at 50-60m.

Reproduction by basal laceration produces clusters on a single fan but the fact that they appear as single individuals on widely spaced fans indicates there must be sexual reproduction also, with the larvae being carried by the current. The very slight currents on the Rosehill would account for the large numbers settling out in the one area. Stronger currents on the Persier could mean the larvae being carried away from the wreck before settling out and if short-lived only a very small proportion may find a suitable sea fan to settle on before dying or being eaten. However, Seasearch records indicate a wide spread of sites with single records

and anemones apparently ephemeral at many, thus the larvae must travel some considerable distance on occasions in order to 're-seed' certain sites so may be longer lived than originally thought.

### **Are they increasing in numbers?**

Stephenson (1935) writes "I have seen numerous specimens taken off Plymouth, where it is not uncommon (Mewstone ledge etc.)" Today they are hardly ever recorded on Mewstone Ledges and have decreased generally since the 1930s. Seasearch records of them have indeed increased in the last few years but that is almost certainly due to divers being better at spotting and recording them. They are however still only recorded from a very few sites and in general individually or in small numbers.

### **Conservation**

Both the pink sea fan and the pink sea fan anemone are BAP species. The pink sea fan anemone is rare. It is almost exclusively associated with the pink sea fan which it damages but the population of sea fans is obviously healthy enough to sustain this damage. It appears that when the sea fan anemone finds a site which really suits it they thrive but at most other sites they are ephemeral. Thus the conclusion must be drawn that protection of the pink sea fan is the best way of protection for the sea fan anemone but **more especially protection of those sites where the anemone is known to thrive is exceedingly important so as to preserve a healthy and sustainable reservoir population. The wreck of the Rosehill would appear to be one of those few sites.**

## 5. References

- Manuel R L (1981) British Anthozoa, Synopses of the British Fauna No 18, Academic Press
- Marine Biological Association. 1957. Plymouth Marine Fauna. Plymouth: Marine Biological Association of the UK.
- Stephenson T A (1935) The British Sea Anemones. Volume II.
- Sharrock S (2009) Plymouth Drop off Survey 2006-2009 Report Seasearch/Marine Conservation Society
- Wood C (2005) Seasearch Guide to Sea Anemones and Corals of Britain and Ireland. Marine Conservation Society
- Wood C (2008) Seasearch pink sea fan surveys 2004/6, Marine Conservation Society
- Wood C (2003) South Devon Seasearch Survey, Marine Conservation Society

## 6. Appendix

Sites dived from Plymouth where sea fan anemones have been recorded:

Site	Abundance on SACFOR scale	Frequency	Approximate depth range
Hatt Rock	Rare to Frequent	Usually recorded	25m+
Hand Deepes	Rare	Sometimes recorded	25m+
Eddystone reefs	Rare to Occasional	Sometimes recorded	20m+
Rosehill	Common	Always present	c28-30
Rosehill reefs	Occasional/Common	Always present	c28-30
Plymouth Drop off	Rare to Occasional	Always present	31-40+
Blackstone Point	Rare to Occasional	Present up to 2008	25m+
Hilsea	Rare	Sometimes recorded	25m+
Persier wreck	Rare to Frequent	Only some years	c28