Seasearch Pink Sea Fan Surveys 2014

Seasearch has been carrying out detailed surveys of pink sea fan, *Eunicella verrucosa*, populations since 2000 using the methodology set out in Wood 2003a and 2008. This involves volunteer divers recording the location, density and habitat of populations as a whole , together with detailed information on individual sea fans including size, condition and any fouling organisms. A particular record is kept of sea fan anemones. *Amphianthus dohrnii*, sea fan nudibranchs, *Tritonia nilsodneri*, and more recently sea fan false cowries, *Simnia hiscocki.*

This report summaries the finding of surveys carried out during 2014. The full data have been entered into an Access database and a summary of has been included in the Seasearch pink sea fan dataset available for all to use on the National Biodiversity Network (NBN).

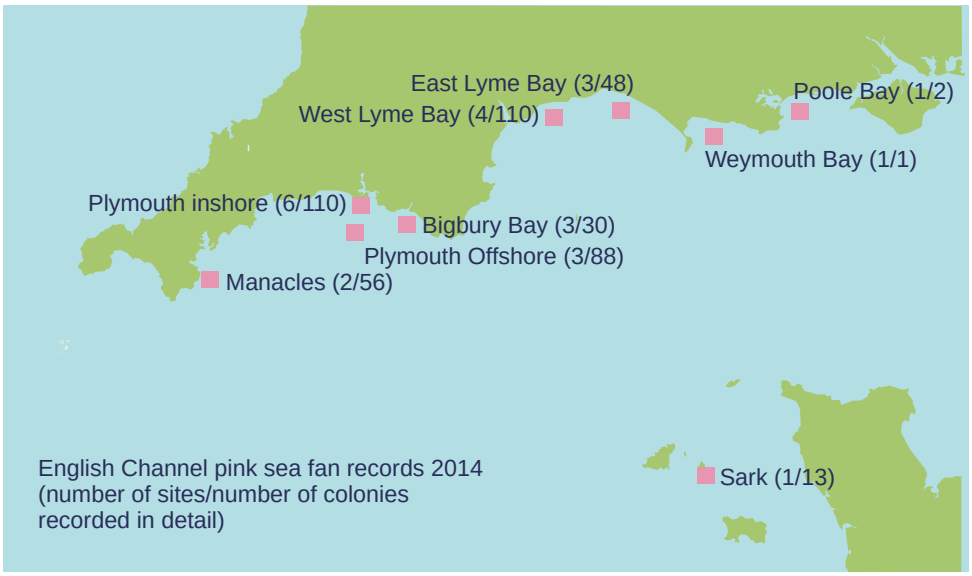
The main focus of our surveys in 2014 was to record the impact of the severe winter storms which were experienced throughout the sea fan distribution range in southern England in early 2014. Surveys were carried out in Dorset, south Devon and Cornwall between May and September and covered both known population hot spots and sites which had not had the benefit of previous records.

In addition surveys were also carried out at Lundy Island, North Devon, where we have been monitoring populations since disease badly affected the populations here between 2001 and 2002 (Wood, 2003a).

During 2014 39 sea fan survey forms were received containing detailed information on 512 individual colonies. The records were made in Devon (22 forms), Cornwall (9 forms), Dorset (7 forms) and the Channel Islands (1 form). Pink sea fans were also recorded as a part of general Seasearch recording and these records are not included here. They can be found in the Seasearch Marine Surveys dataset on the NBN.

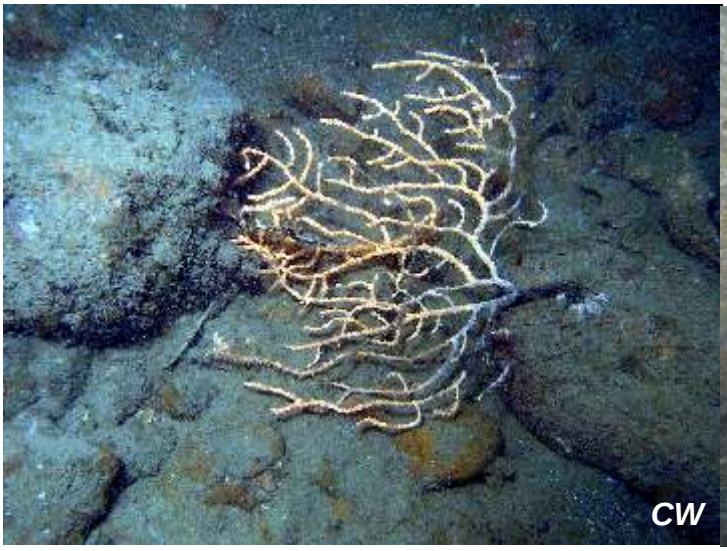
1. Post-storm records in the English Channel

The map shows the sites from which detailed pink sea fan records were made in the English Channel and the number of colonies sampled in each area.



The earliest records were made in Eastern Lyme Bay in early May. At that time conditions were very silty bwith both suspended particles in the water column and a layer of silt covering the sea bed. Two sites were visited and in both cases there were detached or buried sea fans present resulting in a low average condition score of 3.71 (out of 5).

This part of Lyme Bay is the most exposed to south westerly winds and dead sea fans are commonly washed up along the adjacent Chesil Beach after winter storms (Hatcher and Trewhella 2006).



The images above show two colonies from the May survey. The left image shows a colony that has been snapped at the base and is lying on the bouldery sea bed. The lower part of the main stalk has died and there is degenerating tissue on all of the lower branches. The remaining part is alive but is not feeding and exhibits a spindly 'stressed' appearance. This fan will not survive. The sea fan in the right hand picture is partially buried in mobile sediment that has covered the seabed. Sea fans can grow in areas where there is a thin veneer of stable sediment over rock, however this is buried by between a third and a half and is unlikely to survive.

The same area was visited again in September, although a different site was surveyed. By that time there was much less suspended sediment, although there was still a layer of fine silt over most surfaces. Sea fans were recorded as common and the average condition score was 4.55, much higher than in May. Detached or buried sea fans were not seen and it must be assumed that any that had been present earlier in the year had been washed away. However as sea fans remained common it suggests that there had been no major damage at this site at least.

The Manacles, Lizard peninsula, Cornwall

The Manacles are a known hotspot for pink sea fans with extensive populations both on the rocky pinnacles and on the flatter rock and boulder seabed around them. Two sites were surveyed, both of which were known to have had healthy sea fan populations. At the time of our surveys in early July sea fans remained common at both sites and the average condition score was 4.16. This is in line with previous records. There was no silty layer over rocky surfaces and no significant storm damage recorded (picture on first page). The main source of damage at here was fishing related with both pot rope (right) and angling line wrapped around sea fan colonies.

Plymouth Offshore

Three sites were surveyed, Hand Deeps, Eddystone and the Plymouth Drop Off. These are all known to have extensive sea fan populations below 25m depth. All three would have been fully exposed to the southerly gales. Despite this there were only limited signs of storm damage and the populations remained in good condition with an average condition score of 4.28 (picture left). Damaged fans were recorded at the Drop Off (35m depth), with two broken off colonies observed and one with a large cobble laying flat against it (removed by the surveyor).

Plymouth Inshore

The Plymouth area is a hot spot for pink sea fans and they can be found in a number of quite different habitats. The sites surveyed included the wrecks of the Scylla and James Eagan Layne, which are in an exposed position in Whitsand Bay, moderately exposed reefs near the Mewstone and a sheltered man-made habitat, the breakwater Fort within Plymouth Sound. Some damage was recorded at both of the sites near the Mewstone with two detached fans seen, but again overall the populations were in good condition with an average condition score of 4.41.

What was most remarkable at these sites was the high number of small sea fans, many of which would be less than a year old. The picture (right) shows a section of wreckage at the James Eagan Layne with one medium sized sea fan and seven new recruits all single sticks and up to 5cm tall. As sea fans can grow at 10-12cm a year when this small, though they slow down one they begin to branch, these are all colonies less than a year old. The proportion of single stick juveniles was the highest on a rocky reef next to the Scylla wreck where 65% of the colonies measured were single stalks less than 12cm high.

Bigbury Bay

Three sites were surveyed in Bigbury Bay. The wreck of the Persier is known for it's abundant pink sea fan population (Wood, 2008). The sea fans are found on flattened wreckage and the site is exposed to the south and might therefore have suffered from storm damage. Sea fans remained abundant and in good condition with no apparent storm impact. On the adjacent reef sea fans were less common and there were mobile cobbles and pebbles present which might have had an impact. One broken off colony was observed.
The third site studied was East Rutts. On the south east side pink sea fans were rare. Previous records have been from the, more sheltered, north west side where sea fans were common (Wood, 2008). It is not clear if there has been significant damage here as the north west side was not surveyed in 2014.

Western Lyme Bay

Four sites were surveyed in the western part of Lyme Bay in September, some six months after the winter storms. Sea fans were 'forest' abundance at West Tennants, common at Beer and occasional at Eastern Heads and north of West Tennants. The populations were in excellent condition with a condition score of 4.69, the highest of all of the areas surveyed. This not only shows that the storms did not adversely impact the sea fan populations at this site, but also demonstrates the beneficial impact of the banning of scallop dredging in Lyme Bay in 2008 following extensive damage in 2005-7. The pictures below are both from the West Tennants site the first taken in 2006 and showing extensive damage, and the second in 20114 showing a thriving sea fan 'forest'. Whilst most of the sea fans pictured in the second image are mature colonies, older than 2008, 16% of those surveyed here were 12cm or less in height and have become established since the dredging ban in 2008.

Sark, Channel Islands

One site was surveyed where the average condition score of the sea fans was 4.0. The most significant aspect of this population is the large size of the sea fans including the largest recorded in this study of 72x45cm.

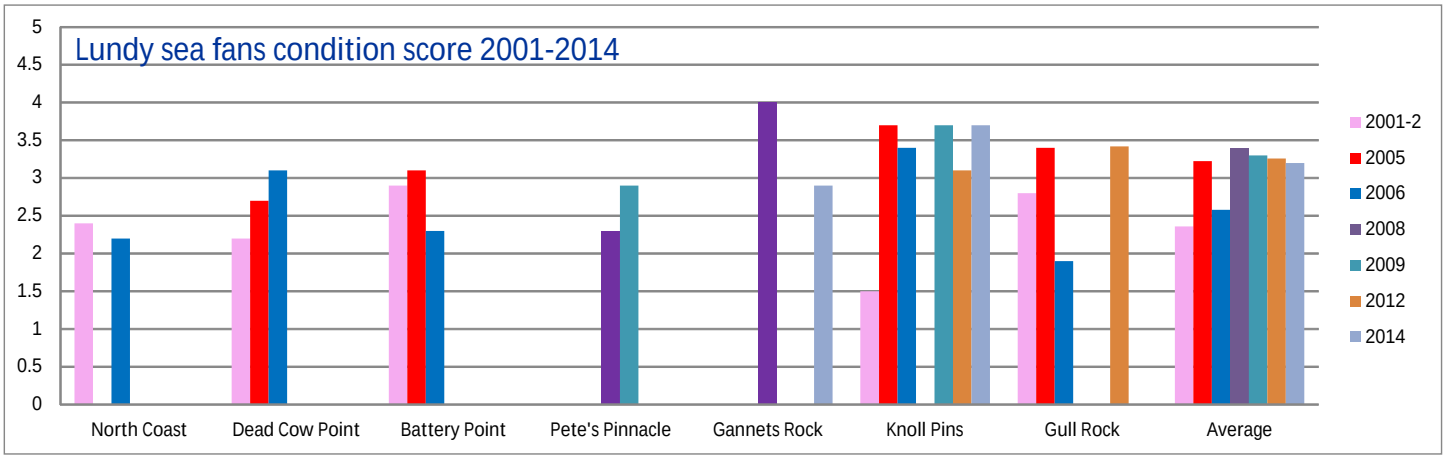
2. Pink sea fans at Lundy 2001-2014

Seasearch has carried out regular surveys of the sea fan populations at Lundy since 2001. Lundy sea fans suffered from a bacterial infection in 2001 (Hall-Spencer *et. al.* 2007) which caused extensive necrosis of colonies and was followed by fouling of the still standing dead colonies with a silty faunal turf. Many of these dead colonies still stand and provide a habitat for a variety of invertebrate fauna. Where colonies were not completely killed the remaining living sections continued to grow and a particular characteristic of the sea fans on Lundy remains large colonies with a dead and fouled centre and healthy growing extremities, such as the one in the picture above. The condition score in 2001-2 was 2.2 which means that over half of the surface area of the sea fans that remained was dead. The table bar chart below shows the average condition score of sea fans at a variety of sites around the island and the average of all of the records made on each occasion.

Unfortunately the complexities and expense of diving at Lundy limits the number of surveys we have been able to carry out. We are particularly sorry not to have been able to dive on the western side of the island on any of our surveys since 200 because of adverse weather conditions. For this reason all of the records from 2008 to 2014 have been from sites on the relatively sheltered eastern side of the island.

The records from 2008 to 2014 show a relatively stable situation which is better than that during and just after the disease period, largely because of new growth on existing colonies. The average condition, however, remains poorer than in any of the other areas surveyed. One reason for the slow rate of recovery is the lack of new recruits to the population. In 2014 no new 'single stick' recruits were observed, contrasting with 16% of the population in Western Lyme Bay and 65% on the Scylla reef in Whitsand Bay.

It is a characteristic of sea fan populations that those at the extremes of the distribution in Pembrokeshire and east Dorset consist almost entirely of large mature colonies and do not show any regular recruitment of new ones. Whilst Lundy is not at a geographical extreme it is afected by relatively turbid waters because of its position at the entrance to the Bristol Channel and this situation (replicated in Pembrokeshire and east Dorset) may contribute to the low rate of recovery.



3. Outlying pink sea fans colonies in Dorset

Pink sea fans have been reported from Weymouth Bay and Poole Bay in Dorset infrequently since 2000 (Wood, 2003 & 2008), and a significant population has been surveyed in Worbarrow Bay (Tinsley, 2005). In 2014 records of individual mature fans were made at Lulworth Banks in Weymouth Bay and Marks Reef in Poole Bay. Like most 'edge of range' sea fans these were single mature colonies and not newly recruited sea fans have been recorded in this area.

In one case the record confirmed the continuing existence and good health of a sea fan (now 33cm x 22cm) which was rescued by divers in 2006 after it had been smothered by movement of a large boulder, presumably as a result of potting activity (Markey, 2014).

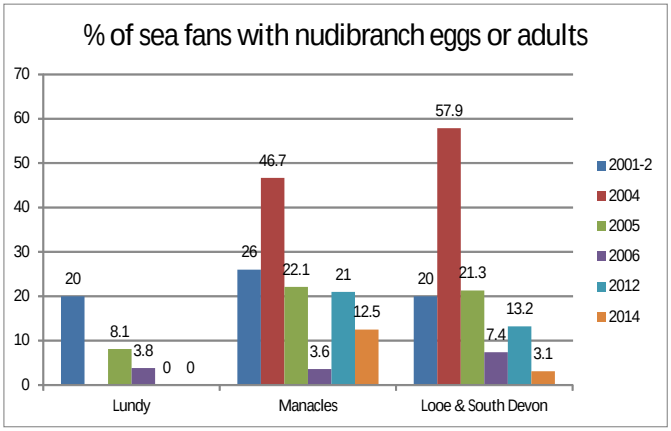
4. Sea fan nudibranchs, anemones and false cowries.

Since their inception Seasearch pink sea fan studies have recorded the presence of sea fan nudibranchs, *Tritonia nilsodhneri*, and sea fan anemones, *Amphianthus dohrnii*. In 2013 the methodology was revised to also include sea fan false cowries, *Simnia hiscocki*.

Sea Fan Nudibranch, *Tritonia nilsodhneri*

These nudibranchs have an obligatory association with pink sea fans, though adults can occasionally be seen moving along the seabed between colonies. They are well disguised as they resemble a cluster of polyps, (photo left). The egg masses are rather more obvious (photo centre right).

The numbers of nudibranchs present on sea fans has varied enormously from year to year during the period of our surveys. In 2014 only 3.7% of the 512 colonies examined in detail had either adults of egg masses present. This is much lower than in previous years. Numbers of nudibranchs have fluctuated wildly from year to year. In 2004 there appeared to be a population explosion on the south coast of Devon and Cornwall but numbers have dropped ever since. In Lundy no nudibranchs at have been recorded in the surveys undertaken in 2012 and 2014, whereas in 2000-2 they were present on 20% of the sea fans surveyed. In 2014 nudibranchs were recorded only in the Manacles (12.5%) Plymouth Inshore (3.1) and Lyme Bay (3.1%).



Sea Fan Anemone, *Amphianthus dohrnii*

This anemone is much rarer than the sea fan nudibranch. In our 2004-6 studies it was found on 1.24% of colonies surveyed (Wood, 2008). In 2014 it was on less than 1% of colonies and only at the Manacles and Plymouth Offshore. However at the Manacles it was on 5.4% of sea fans.

Typically a number of anemones were found on a single sea fan. This is because of the ability of the anemone to reproduce by basal laceration.

Sea Fan False Cowrie, *Simnia hiscocki*

This cowrie was only recognised as a separate species from that found on soft corals in 2011 (Lorenz and Melaun, 2011). Earlier records of false cowries on sea fan will have been identified as *Simnia patula*.

In 2014 *Simnia* was recorded on 1.6% of pink sea fans and only in Lundy (3.8%), Manacles (5.4%) and Plymouth (1.3%). There were no records from Lyme Bay or Dorset.

This report has been written by Chris Wood based on Seasearch Sea Fan Survey records made by Charlotte Bolton, Chris Webb, Chris Wood, Fiona Ravenscroft, Mary Restell, Nigel Topham, Peter Hewitt, Richard West, Roy Restell and Sally Sharrock. Photos by Chris Wood, Chris Webb and Mike Markey. Seasearch would like to thank the volunteer divers for their records and also a variety of charter skippers for taking us to the sites. Report published by Marine Conservation Society for Seasearch in March 2015. www.seasearch.org.uk

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