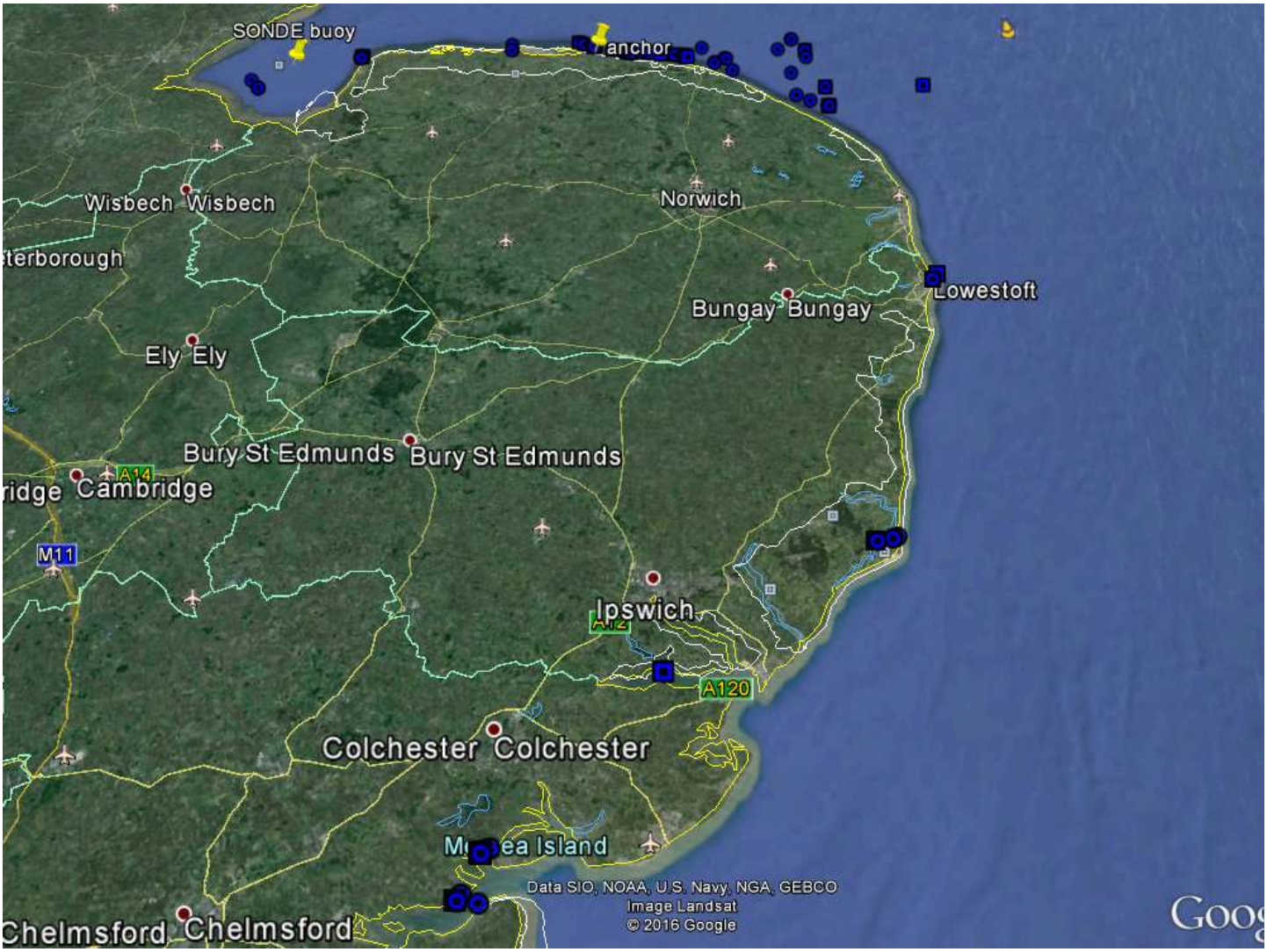
Seasearch East Report 2015

This report summarises the activities of Seasearch in East Anglia during 2015



Sites recorded by Seasearch East in 2014 and 2015 (blue squares and circles and yellow pins)

Intertidal chalk at Robin's Friend, near Sheringham

East Anglia covers a huge range of habitats for wildlife, from the fine mud of Essex and Suffolk estuaries, to the offshore sands and gravels of Norfolk and Lincolnshire, to the chalk reef and exposed peat, clay and drowned forest of inshore Norfolk. Man made habitats include marinas, metal wrecks and lost pipelines and wartime defences.

Returning to some sites on a regular basis has revealed that slight changes to conditions year on year enable different species to get a foothold and

become numerous or even dominant for short periods of time. 2014 was the year of the *Molgula sp* squirt, with all Norfolk sites dominated by an almost continuous sheet, sightings have returned to occasional to frequent in 2015, while *Sabellaria spinosa*, previously recorded rarely, has now been seen in most sites, becoming dominant 300m off Overstrand. The following paragraphs describe the dives undertaken in each county in more detail, highlighting new sites explored and the changes seen.

Lincolnshire

Following the success of our partnership with the Eastern IFCA in 2014, we arranged to deploy an array of colonisation plates on the seabed in the centre of the Wash, aiming to revisit at regular intervals to monitor growth and swap in new plates as necessary.

The array was deployed from the EIFCA's large RHIB and attached to the mooring for the SONDE buoy, so that it would be easy to find in the future. A dive was undertaken to ensure the array had settled properly and to survey the local seabed.

Colonisation plate array in place on the seabed

A second dive was then done on an area close to the Lincolnshire shore where a *Sabellaria spinosa* bed was thought likely. This dive was a moderately fast drift in very low visibility, but healthy beds of first *Sabella pavonina* and then *Sabellaria spinosa* were seen and recorded.

Unfortunately, opportunities to revisit the array have since coincided with rough weather over the winter, meaning that it wasn't dived again it again until 2016, when it was found to be buried by sediment. Adjustments have been made to raise the structure off the seabed and we intend to return regularly during the summer.

Part of Sabellaria spinosa drift, showing brittlestars, hydroids and a lot of suspended sediment

***Psammechinus miliaris* 'nests' forming mini reefs**

***Pagurus bernhardus* with fetching hat**

Norfolk (excluding MCZ)

This section covers all the records taken between Salthouse and Kings Lynn, and a couple of wrecks off Sea Palling - dives undertaken between Happisburgh and Weybourne are in the next section and also have their own separate MCZ report.

Kings Lynn

Only one record was made for Kings Lynn in 2015, a single species form for the alien invasive worm *Ficopomatus enigmaticus*. This worm had been noted in video footage taken during 2015, but it wasn't possible to get a confirmed ID until a sample was taken from Purfleet Quay. This was the final record of the year, obtained by Rob Spray during his lunch break from a meeting – every day is a Seasearch day!

Purfleet Quay at Kings Lynn

Hunstanton

Hunstanton also only produced one record, an Observer form from the lower shore in April. This site was the scene of the unfortunate sperm whale stranding later in the year.

Cley

As well as the wreck of the Vera with its abundant nudibranchs and the surrounding boulder plain, Cley now also has the flooded forest; an area of compressed peat, fallen trees and glacial clay to attract divers. Both sites proved very popular this year, with a total of 30 forms between June and November.

Tree trunk with diver at Cley

A nosey but shy seal joined divers on the wreck and forest dives and a pair of cormorants were seen chasing sand eels around the 3m high lost anchor on the forest bed. Work continued to mark more of the extent of the flooded forest; not easy when the nearest parts to shore involve a swim of more than 300m over sand – one dive involved a 2km swim without seeing it at all!

Typical forest dives. The furthest explored point is 630m out.

Salthouse

Big winter storms have inundated the Salthouse car park with shingle and now the only access is from a single track road very popular with bird watchers. To get a space, you need to arrive either very early or very late, so only those on the spot can dive easily. Michael Southwood managed to produce 3 Observer forms during August and September, which enabled us to keep a continuous record of this relatively unexplored site.

Soft chalk scene at Salthouse

Sea Palling wrecks

Simon Parker provided Survey forms from the wrecks of the Montferland and Rye, 8 and 15 miles East of Sea Palling respectively. Abundant *Sabellaria spinosa* beds were recorded in the mixed sediments around the Rye, an important species not often seen off Norfolk.

Cromer Shoal MCZ

(See also separate MCZ report). The new MCZ covers the area between Weybourne and Happisburgh, from 200m below the low water mark to 6 miles out. This section describes the dives done in and around this area.

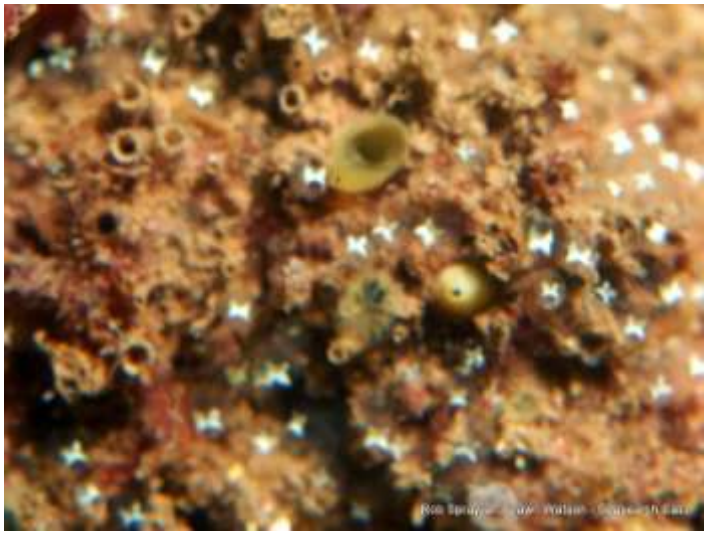
Weybourne

As well as the very popular wreck of the Rosalie, Weybourne also contains other scattered wreckage, windfarm cable junctions and large areas of soft chalk, both as isolated undercut outcrops and reef with gullies. Between the wreck to the West and the chalk to the East, there is a large expanse of flat sand with flint boulder plains.

The wreck of the Rosalie has been opened up slightly by winter storms and it is now possible to drop below deck level to see sponges, such as *Raspailia ramosa* and *Aplysilla rosea*, both recorded on this site for the first time this year. It is also possible to swim beneath the wreckage, but it is now very unstable, so this is not recommended. 17 Observer and 5 Surveyor forms were completed for the wreck of the Rosalie, with 16 Observer and 11 Surveyor forms for the surrounding seabed. Significant species on the sand and chalk included the nudibranch *Palio nothus*, *Corystes cassivelaunus* (masked crabs), *Aphia minuta* (transparent gobies) and the tiny squat lobster *Galathea intermedia*.

Spalla Gap

Spalla Gap is a site which can only be reached with the permission of Sheringham Park NT staff, or via a very long walk with heavy kit! The approach is also only really suitable for 4WD vehicles when the weather has been dry for a while. As a consequence, only a few dives are made each year. This site includes a chalk plain overlaid with chalk rubble with gradually increasing gullies and features with depth. It is one of only two sites (the other being the Rosalie wreck) where the squirt *Pycnoclavella stoloniallis* is recorded in East Anglia.



***Pycnoclavella stoloniallis* at Spalla Gap**

Sheringham

The most rugged and interesting parts of the chalk reef are found off Sheringham, from the rarely exposed rockpools at Robin's Friend to the Northwest, to the Stunning Burlington Arches 600m North of the town centre, to the rolling plain and isolated outcrops surrounding the old pipeline to the Southeast. Sheringham also has relatively easy parking close to shore, keen RNLI life guards and plenty of facilities, making it very popular for club diving and training weekends. 17 Surveyor and 10 Observer forms were received from this site in 2015

as divers sought to expand knowledge of the topography and species.

One area intensely dived was the abandoned Victorian sewer pipe easily accessed from the Southeast end of town. We hope to work with local councils to provide a snorkel trail here in 2016 and have been working to map the extent available. This site includes a lot of chalk reef which was either cut into or built up to provide a base for the pipe which has since been recolonised. The pipe is very popular with corkwing wrasse and Inachus sp spider crabs, containing higher concentrations of both than any other Norfolk site.

Raised section of Sheringham pipe with mixed community

West Runton

Only a few dives were made at West Runton in 2016 due to this site always having poor visibility in anything other than perfect conditions, but the first dive at the end of August found not only a large area of *Halidrys siliquosa* (previously only recorded as a single individual at Weybourne), but also a *Craterolophus convolvulus* stalked jellyfish!

Stalked jelly – *Craterolophus convolvulus* at West Runton

This species is only rarely recorded and the only other East coast records are from Yorkshire. Interestingly, there are no records at all on the East coast prior to 2012, so this may be a species on the move.

East Runton

Reasonably heavy inshore sand and very little tide makes East Runton a generally clearer site than West. The addition of freshwater springs bubbling through the mixed chalk reef and sandmason dominated sand patches encourage a great diversity of seaweed species here. 5 each of Observer and Surveyor forms were received from this site. Most divers stay on the low reefs and gullies inshore, but there are areas of 3m high walls and very large undercut outcrops yet to be fully explored further out.

Typical East Runton seabed of sediment on chalk with algae

Overstrand

A fascinating site made up of many habitats including exposed clay, huge flints, chalk reef and soft rock, Overstrand can only be dived on a high slack – every attempt on a low has met with complete darkness! It is also the site calling for high levels of physical fitness or a trolley – the path from parking to the water is very long and steep. 3 Observer and 9 Surveyor forms were filled in for Overstrand in 2015, mostly for October onwards when parking and entering the water became easier. This is the only shore diving site where *Scyliorhinus canicula* (cat sharks) can be seen and contains an interesting area of massive isolated chalk and flint boulders on a polished chalk plain, each dominated by one or two sponges or squirts, several of which are rarely seen elsewhere. A large area with an almost continuous thin crust of *Sabellaria spinosa* found near the end of the year.

Most of the dives here have included mobile phone using a GPS app attached to a buoy in an attempt to map out the various habitats found and how they

relate to one another. The main thing discovered was that the exciting habitats are mostly to the East and West of the main entry point, meaning that lazy divers have a duller time!

***Haliclona viscosa* covering a boulder at Overstrand**

Further Southeast – Happisburgh

The south-eastern end of the MCZ terminates at Happisburgh, meaning that most wreck dives out of Sea Palling fall outside of it. One dive day was arranged with Anglian Divers, a local BSAC club. One slack dive was done on the area surrounding the Artemesia wreck and a drift not far off Happisburgh followed.

Coryphella brownii on the Artemesia wreck

The wreckage contained *Polymastia boletiformis* sponge, which has been recorded only once before in this area. The drift was over mostly cobbles and pebbles stabilised by *Molgula sp* squirts, a species which has been superabundant on all Norfolk sites in previous years.

Suffolk

Orfordness

We continued our work with the NT staff on Orfordness reserve, using a series of colonisation plates which were checked on a roughly monthly basis throughout the year before being recovered, dried and sent to Mary Spencer Jones at the NHM for further study. Most of the plates were placed around the pontoons on the river Alde, with the rest in two saline lagoons, one of which had a feed directly from the river. One dive was attempted from the beach, but there was no visibility, so a record was taken from boulders carried back to shore. 11 Each of Surveyor and Observer forms were filled in. Notable species include enormous colonies of the bryozoan *Conopeum seurati* and superabundant *Hydrobia neglecta* in the saline lagoons.

Colony of Conopeum seurati on a colonisation plate

Entertaining the locals with live finds on community day

Levington Marina

We try to get at least one survey a year done at Levington Marina, a very sheltered site on the River Orwell. Although almost certainly full of the usual pollution associated with marinas, this site is remarkably free of litter. In addition to the usual pontoons, it now has large plastic 'flotation units' which small boats can be driven onto and be out of the water. These and the refurbished pontoons have provided lots of new ground for algae and encrusting animal life this year. The surfaces are dominated by algae, including the invasive kelp sp wakame (*Undaria pinnatifada*), with darker spaces being dominated mainly by squirts and a thick crust of *Jassa sp* crustaceans. One notable visitor was a tiny shoal of juvenile garfish, *Belone belone.*

Under pontoon scene including *Botrylloides violacea, Bugula neretina* and various squirts

Long lobster shrimp – *Sinelobus sp*, an invasive alien at Levington marina

Essex

Jon Chamberlain has done most of the organisation for Essex; setting up the 'Blackwater Explorers' Facebook group and arranging several Shoresearch events as well as dives, some involving the Colchester BSAC club.

5 Surveyor forms were received, all focussing on the Blackwater estuary. Notable species include *Eubranchus doriae, Leptoplana tremellaris* and *Chondria coerulescens,* the latter being a new record for the East coast!

Typical Blackwater assemblage – Slipper limpets forming a 'base' for anchoring species of sponge, squirt and bryozoan

***Chondria coerulescens* under the microscope**

Other activities

Television appearances

The fossilised forest at Cley (see Norfolk excluding MCZ above) was featured twice on national and local television and newspapers in January and August, triggering a wave of increasingly enthusiastic and inaccurate reports across the world, culminating in a piece from India reporting on an underwater jungle the size of a continent!

Courses

We ran a well attended Observer course in Sheringham in early July. Unfortunately, the weather was a little borderline for an evening dive on the Saturday, so the students voted for a Greek meal and a morning dive at 5.30am! Luckily, it was a beautiful calm morning and everyone agreed it had been worth the early start.

A sponge ID course later in July with Jen Jones as tutor also fell foul of the weather, with huge storms for the whole weekend. Many local samples had been taken in the previous week, so enthusiastic use was made of the facilities at Gresham's School, which had been organised via a grant from the local Biodiversity service.

Colonisation plates

As mentioned above, colonisation plates were set up in various sites around East Anglia, providing a good snapshot of species present and also a networking opportunity with various local organisations.

Enthusiastic growth of hydroids, anemones and nudibranch eggs on a colonisation plate

The most ambitious project was to place a large array in the centre of the Wash in conjunction with the EIFCA, but individual plates were also placed at Weybourne, Cley, Sheringham, the Blackwater and Orfordness, the latter with the assistance of the National Trust volunteers. Plates were removed at regular intervals for examination, drying and sending on to the NHM for electron microscopy when the workload allows – this will add to the known species list of bryozoans in the future.

Other local networking

Several initiatives were undertaken to improve local relationships over the summer. A snorkel day was arranged for the EIFCA staff and a Cromer councillor at Sheringham, followed by a gentle shore dive (after suitable training) for the councillor, who was thrilled to finally see for herself what the MCZ process was supposed to be protecting!

Very happy local councillor post reef dive.

We helped CEFAS with some crab release testing, prior to a large study on trawling fatalities. This involved taking a box of edible crabs and some bait on a shore dive to record their movements. It was very useful for us too; what appeared to be barren sand was soon heaving with dab, brown shrimp and shore crabs! We also paid a visit to CEFAS to see some seabed maps of Norfolk they were producing. Several members of staff were interested in Seasearch and two attended the Observer course in 2016.

We ran a Shoresearch course for NWT in September. Unfortunately for us, all the attendees were tourists, but were keen to try it out once home.

Seaweeds of the English East coast

The book of pressings which was produced from samples collected on the 2011 seaweed road trip from Essex to the Farne Islands has now been published in A3, A4 and A5 sizes, thanks to generous grants from the Wildlife Trusts and Norfolk Biodiversity Information Service.

Official handover of A3 version of 'Seaweeds of the English East Coast' to David North of Norfolk Wildlife Trust

A paper written in conjunction with Tony Leech of the Norfolk and Norwich Naturalist Society which includes lists of species previously found and those identified by Seasearch since the expedition has also been published.

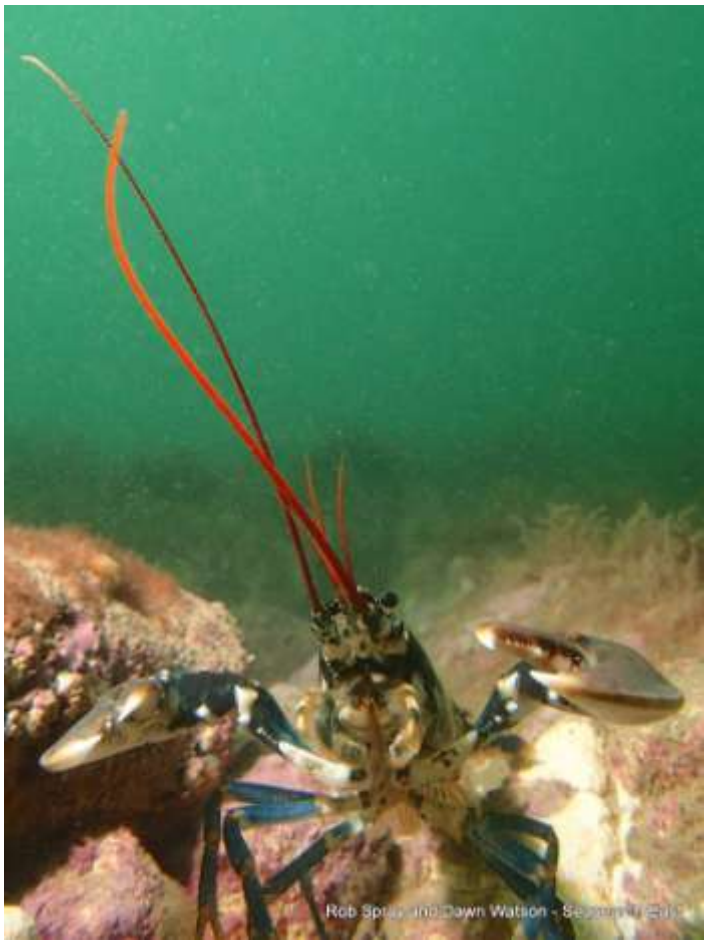
Website

The popular 'Twin wreck challenge' Norfolk diving information page has now been updated, expanded and joined by a new guide to diving on the chalk reef for visitors to the area.

Species records

The appendix below lists all the species recorded by Seasearch East volunteers during 2015, with a grand total of 414. Interestingly, although this is less than the total for 2014 (434), there was an increase in almost all groups except hydroids and algae – 2014 was the year of the hydroid and bryozoan roadtrip involving experts from Heriot-Watt University and the Natural History Museum, so a drop in recorded species in 2015 seems perfectly reasonable and the algae numbers could be due to a change in weather conditions.

The table is broken down by county and phylum with totals in bold at the end of each section.



Common lobster – *Homarus gammarus*

Northern prawn – *Pandalus montagui*

Rob Spray fixing colonisation plates to the Victorian sewer pipe at Sheringham

Bib - *Trisopterus luscus* at Weybourne

SPECIES LISTS

Scientific name	Common name	Lincs	Norfolk	Suffolk	Essex	East Anglia
Porifera	**Sponges**					
Halichondria panicea	Breadcrumb sponge	O	O-C	C	F	O-C
Halichondria bowerbankii	a sponge		O-F	F	O-C	O-C
Oscarella sp	a sponge		O-C			O-C
Sycon ciliatum	Vase sponge		O-C		O-C	O-C
Grantia compressa	Purse sponge		R-F		C	R-C
Haliclona oculata	Mermaid's glove	O	R	O-F	O	R-F
Haliclona viscosa	A sponge		R-F			R-F
Haliclona cinerea	A sponge		R			R
Halisarca dujardini	A sponge		O-C			O-C
Raspaillia ramosa	Chocolate fingers sponge		R-F			R-F
Cliona celata	Boring sponge		O-C			O-C
Amphilectus fucorum	Shredded carrot	O	O-A		F	O-A
Cliona celata			O-C		O-F	O-C
Porifera ind	Massive orange				R	R
Leucosolenia sp	Spikey lace sponge		R-O	F	F	R-F
Guancha lacunosa	a sponge				R	R
Porifera ind	Yellow crust		O-F		F	O-F
Porifera ind	Black crust		O			O
Porifera ind	Peach crust		F-C			F-C
Porifera ind	Orange crust		O			O
Porifera ind	Spreading cream crust		O-F			O-F
Myxilla incrustans	A crust		O-C			O-C
Mycale similaris	a crust				O	O
Dysidea fragilis	Goosebump sponge		O-F			O-F
Dysidia pallescens	Pink goosebump		R-F			R-F
Clathrina coriacea	Lace sponge		O-F			O-F
Aplysilla sulphuria	A sponge		R-F			R-F
Aplysilla rosea	A sponge		R			R
Porifera indet	Yellow 'shredded carrot'		O-C			O-C
Porifera indet	pink 'shredded carrot'		O			O
Porifera indet	blue 'shredded carrot'		O			O
Steligera rigida	A sponge		R-O			R-O
Hymedesmia sp	Norfolk purple sponge		O-F			O-F

Scientific name	Common name	Lincs	Norfolk	Suffolk	Essex	East Anglia
Polymastia boletiformis	Hedgehog sponge		R-O			R-O
Polymastia penicillus	Chimney sponge		R-O			R-O
Hemimycale columnella	Crater sponge		R			R
Suberites ficus	Sea orange		O-C			O-C
		3	**34**	**4**	**12**	**37**
Cnidaria	**Hydroids and anemones**					
Actinia equina	Beadlet anemone		R-C			R-C
Metridium senile	Plumose anemone	R-C	R-S	O-F		R-S
Sagartia troglodytes	an anemone	O	R-C		R-F	R-C
Sagartia elegans	Elegant anemone	O	R-A			R-A
Urticina felina	Dahlia anemone		O-F		F	O-F
Diadumene cincta	Orange anemone		C	F-S		F-S
Tubularia indivisa	Oaten pipes		O-A	O-S	F	O-A
Tubularia larynx	Oaten pipes		C	A		C-A
Hydractinia echinata	Hermit fur	O-F	R-O			R-F
Sertularia cupressina	White weed	O-C	O		F-C	O-C
Eudendrium sp	a hydroid	O-F	O-F		O	O-F
Eudendrium arbusculum	a hydroid		F			F
Abietinaria abietina	A hydroid		O			O
Halecium halecinum	A hydroid		O-F			O-F
Hydralmania falcata	Helter skelter hydroid	O	R-O		O-F	R-F
Clytia hemisphaerica	a hydroid	F-C	F-C			F-C
Plumularia setacea	a feathery hydroid		O-A		F	O-A
Obelia dichotoma	A hydroid		O-F			O-F
Garveia nutans	A hydroid		O-F			O-F
Lafoea dumosa	a feathery hydroid				O	O
Diphasia margareta	a feathery hydroid				R	R
Kirchenpaueria similis	a feathery hydroid		C		O	O-C
Kirchenpaueria pinata	a feathery hydroid		F			F
Hartlaubella gelatinosa	A hydroid		R-C			R-C
Coryne eximia	A hydroid		O-F			O-F
Dynamena pumilla	a hydroid		O-A	F-C	A	O-A
Nemertesia antenina	Antenna hydroid		O-C			O-C
Nemertesia ramosa	Antenna hydroid		R-F			R-F
Sertularella rugosa	A hydroid		R-F			R-F
Alcyonium digitatum	Dead mens fingers	O	O-C			O-C
Auralia aurita	Moon jelly		O	R-C		R-C
Chrysaora hysoscella	Compass jelly		R-O			R-O
Cyanea capillata	Lion's mane jelly		R			R
Craterolophus convolvulus	A stalked jelly		R			R
		9	**32**	**6**	**11**	**34**

Scientific name	Common name	Lincs	Norfolk	Suffolk	Essex	East Anglia
Annelida	**Segmented worms**					
Arenicola marina	Lugworm		F-A		O	O-A
Arenicola defodiens	Lugworm		O-C			O-C
Sabella pavonina	Peacock fanworm	S	O-C	O-C	A	O-S
Aphrodita aculeata	Sea mouse	R				R
Terebellid sp	tubeworm				O	O
Lanice conchilega	Sandmason worm	F-A	R-S	R-O	O-F	R-S
Harmothoe sp	a scaleworm		R-O	R	R	R-O
Harmothoe impar	a scaleworm		R			R
Pholoe minuta	A scaleworm		O			O
Polydora ciliata	a tubeworm		F-S		O	O-S
Scoloplos armiger	a segmented worm				R	R
Amphitrides gracilis	a segmented worm		O-F		O	O-F
Eupolymna nebulosa	Strawberry worm		O-F			O-F
Syllid sp	a segmented worm		O	R-O	R	R-O
Salmacina dysteri	Coral worm		O-C			O-C
Ficopomatus enigmaticus	An invasive worm		C			C
Pomatoceros	Keel worms	O	O-C	O		O-C
Sabellaria spinulosa	Ross worm	S	O-A			O-S
Spirorbis	Spiral worm		F-C		F	F-C
Nereis sp	A ragworm			R		R
Myrianida prolifera	A segmented worm		R			R
Myrianida pinnigera	A segmented worm		R			R
Lumbrineris latreilli	A segmented worm		R			R
Cirratulus cirratus	A segmented worm		F			F
Tubulanus annulatus	Football jersey worm		R			R
Amblyosyllis formosa	A segmented worm		R			R
Oerstadia dorsalis	A flatworm		O-F	O		O-F
Leptoplana tremellaris	A flatworm		O		R-O	R-O
		5	**24**	**7**	**11**	**28**
Crustacea	**Barnacles, crabs, shrimp and lobsters**					
Cirripedia	Barnacles	O-F	O-S	C-A	O-A	O-S
Semibalanus balanoides	A barnacle			F		F
Elminius modestus	A barnacle		F-C	F		F-C
Balanus improvisus	A barnacle		F-C	F		F-C
Balanus crenatus	A barnacle		F			F
Cancer pagurus	Edible crab	R	O-C	R	R	R-C
Carcinus maenas	Shore crab	O	O-F	R-F	O-C	R-C
Necora puber	Velvet swimming crab		R-F			R-F
Pilumnus hirtellus	Hairy crab		R-O			R-O
Portumnus latipes	Pennant's swimming crab		R			R
Liocarcinus depurator	Harbour crab	R-F	R-O			R-F
Liocarcinus corrugatus	Corrugated crab		R			R

Scientific name	Common name	Lincs	Norfolk	Suffolk	Essex	East Anglia
Corystes cassevelauneus	Masked crab		R-O			R-O
Hyas araneus	Sea toad		R-O			R-O
Inachus sp	a spider crab		R-F		O	R-F
Macropodia sp	Long legged spider crab	O-F	R-F	R-O	O-F	R-F
Pisidia longicornis	Long clawed porcelain crab		O-C			O-C
Ebalia tumefacta	Nut crab		R			R
Pagurus bernhardus	Common hermit crab	F	O		O	O-F
Paguridae	Hermit crab	F	O-C		F	O-C
Galathea intermedia	a squat lobster		R-O			R-O
Galathea squamifera	Brown squat lobster		R-A			R-A
Homarus gammarus	Common lobster		R-F			R-F
Palaemon serratus	Common prawn	O-F	R-F	F		R-F
Crangon crangon	Brown shrimp	C-A	O-C			O-A
Athanas nitescens	Hooded shrimp		R			R
Pandalus montagui	Northern prawn	O	O-F			O-F
Eulalus sp	A shrimp		R-F			R-F
Hippolytes varians	Chameleon prawn	O	O-F			O-F
Caprella sp	Skeleton shrimp		F-C	O-A	F-C	O-A
Caprella sp	Red skeleton shrimp		O			O
Amphipoda	amphipods		F-C	F	C	F-C
Isopoda	isopods				C	C
Janira maculosa	An isopod		R			R
Mysida sp	Mysid shrimps		R-C	F	O	R-C
Corophium sp	an amphipod			R-C	O	R-C
Lekanesphaera rugicorda	an isopod				O	O
Sinelobus sp	Long lobster shrimp			R		R
Gammarid	A shrimp		F	R-C		R-C
Gammarellus angulosus	A shrimp			R		R
Jassa sp	An amphipod		F-A	C-A		F-A
Idotea sp	An isopod		R	C-A		R-A
Idotea granulosa	An isopod		R			R
Idotea chelipes	An isopod			R-A		R-A
Idotea linearis	An isopod		O	F		O-F
Copepod	Nudi parasite		R			R
Sphaeroma sp	An amphipod			C		C
Paradoxostoma variabile	An ostracod		R			
		11	**40**	**20**	**13**	**47**
Mollusca	**Molluscs**					
Polyplacophora	chitons		O		O-C	O-C
Leptochiton cinerea	A chiton		O			O
Lamelaria perspicua	A mollusc		R			R
Elysia viridis	Solar powered slug		R			R
Aplysia punctata	Sea hare		R			R

Scientific name	Common name	Lincs	Norfolk	Suffolk	Essex	East Anglia
Doto sp	a nudibranch	O	O-A			O-A
Doto hydrallmaniae	a nudibranch	R	R			R
Doto Millbayana	a nudibranch		F-C			F-C
Doto sarsia	A nudibranch		R			R
Doto pinnatafidita	A nudibranch		R-F			R-F
Doto fragilis	A nudibranch		O			O
Eubranchus doriae	a nudibranch				R-O	R-O
Cuthona gymnota	a nudibranch		O	R		R-O
Cuthona viridis	a nudibranch		R			R
Nudibranch sp	Sea slug eggs		O-F	F-C		O-C
Dendronotus frondosus	Xmas tree sea slug			R		R
Cadlina laevis	A nudibranch		O			O
Coryphella brownii	A nudibranch		R			R
Coryphella lineata	A nudibranch		R			R
Gonoidoris nodosa	A nudibranch		R-F			R-F
Janolus cristatus	Crystal slug		R-F			R-F
Onchidoris bilamellata	A nudibranch		R-S			R-S
Acanthodoris pillosa	A nudibranch		O-C			O-C
Doris pseudoargus	Sea lemon		R			R
Facelina bostoniensis	A nudibranch		R			R
Facelina auriculata	A nudibranch		R			R
Eubranchus pallidus	A nudibranch		O			O
Polycera faeroensis	A nudibranch		R			R
Palio nothus	A nudibranch		R			R
Palio dubia	A nudibranch		R			R
Flabelina pedata	Violet sea slug		R-F			R-F
Tritonia hombergi	A nudibranch		R			R
Aeolidia papillosa	A nudibranch		R			R
Buccinum undatus	Common whelk		O-F			O-F
Hydrobia neglecta	A mud snail			A-S		A-S
Crepidula fornicata	Slipper limpet	O	R-O		C	R-C
Gibbula cineraria	Grey topshell	F	R-F		O	R-F
Caliostoma zizyphinum	Painted topshell	R	O-F			R-F
Buccinum undatus	Common whelk	F	R-F		R	R-F
Littorina sp	Periwinkles				A	A
Littorina littorea	Common periwinkle				C	C
Littorina saxitilis	Rough periwinkle		O			O
Rissoa parva	a gastropod		O-C		O	O-C
Nucella lapillus	Dog whelk		R-F		O	R-F
Lacuna parva	Least chink shell		F-C			F-C
Tectura virginia	White tortoiseshell limpet		R-O			R-O
Tectura tesselata	Tortoiseshell limpet		O			O
Patella vulgaris	Common limpet		R			R
Chlamys sp	A scallop		R			R

Scientific name	Common name	Lincs	Norfolk	Suffolk	Essex	East Anglia
Mytilus edulis	Edible mussel		R-C	F-S	F	R-C
Cerastoderma edule	Edible cockle		R		F	R-F
Cerastoderma glaucum	Lagoon cockle			F-S		F-S
Crassostrea gigas	Pacific oyster			R	F	R-F
Ostrea edulis	Native oyster		R	R	F	R-F
Mercenaria mercenaria	Hard clam				O	O
Teredo sp	Shipworm			A		A
Barnea candida	White piddock		F-S			F-S
Pholas dactylus	Common piddock		R-O			R-O
Ensis arcuatus	Razor shell		F-S			F-S
Sepiola atlantica	Little cuttlefish		R-F			R-F
Loligo sp	Squid eggs		R-F			R-F
Alloteuthis subulata	Small squid eggs		O-F			O-F
		6	**53**	**9**	**14**	**62**

Bryozoa	Sea mats and sea mosses					
Bryozoa	Encrusting bryozoan indet		O-C	F-C		O-C
Conopeum reticulatum	Encrusting bryozoan	F-C	F-C	F-C	C	F-C
Conopeum seurati	Encrusting bryozoan			O-S		O-S
Electra pilosa	Frosty sea mat	F	O-A	F-C	R	R-A
Cryptosula pallasiana	Encrusting bryozoan		F-A			F-A
Parasmittina trispinosa	Encrusting bryozoan		O			O
Schizomavella linearis	Encrusting bryozoan		O-C	O		O-C
Aetea anguina	Snakes head coralline		C			C
Bowerbankia citrina	a bryozoan	F	O-C		O-F	O-C
Bowerbankia gracilis	A bryozoan		R-C			R-C
Bowerbankia imbricata	a bryozoan		O	O	C	O-C
Bicellariella ciliata	a bryozoan	O	R-F		F	R-F
Flustra foliacea	Hornwrack	F	O-C		R-C	R-C
Alcyonidium diaphanum	Finger bryozoan		R-S	F-C	R-F	R-S
Alcyonidium hirsutum	a bryozoan				O	O
Alcyonidium gelatinosum	a bryozoan		O	C		O-C
Alcyonidium mytilli	A bryozoan			O		O
Anguinella palmata	a bryozoan		O-F		F	O-F
Scrupocellaria sp	a bryozoan		F	C	O	O-C
Scrupocellaria reptans	a bryozoan		O-C		R-C	R-C
Scrupocellaria scruposa	a bryozoan		O			O
Scrupocellaria scrupea	a bryozoan		F			F
Vesicularis spinosa	a bryozoan		R-O			R-O
Eucratia loricata	a bryozoan		O-F			O-F

Scientific name	Common name	Lincs	Norfolk	Suffolk	Essex	East Anglia
Bugula sp	Bottlebrush bryozoan		O		O	O
Bugula plumosa	Bottlebrush bryozoan		O-C		F	O-C
Bugula neritina	An invasive bryozoan			C		C
Bugula flabellata	Bottlebrush bryozoan		O			O
Bugula turbinatum	Bottlebrush bryozoan		O			O
Crisia denticulata	a bryozoan		C			C
Crisia eburnae	a bryozoan		F-A			F-A
Crisia sp	a bryozoan		O			O
Cellepora pumicosa	Pumice bryozoan		O			O
Celleporina sp	A bryozoan		F			F
Plagioecia patina	A disc bryozoan		R-F			R-F
Disporella hispida	A disc bryozoan		O			O
Nolella stipata	A bryozoan		F			F
		5	**33**	**11**	**13**	**37**
Echinodermata	**Starfish, urchins and brittlestars**					
Ophiura albida	Sand brittlestar	A	R-C		O	R-A
Ophiura sp	a brittlestar	O	O		O	O
Ophiura ophiura	Sand brittlestar	O			O	O
Amphipholis squamata	A brittlestar		R-O			R-O
Asterias rubens	Common starfish	O-C	R-F		O	R-C
Henricia sp	Bloody henry		R-F			R-F
Crossaster papossus	Common sunstar	R	R-F			R-F
Psammechinus miliaris	Green urchin	O-C				O-C
Echinus esculentus	Edible urchin		R			R
Echinocardium cordatum	Heart urchin		O			O
		6	**8**	**0**	**4**	**10**
Tunicata	**Sea squirts**					
Perophora listeri	a tunicate	F	R-A		C	R-A
Perophora japonica	An invasive tunicate		R			R
Ascidiella scabra	a tunicate		R-F	O	F-A	R-A
Ascidia aspersa	a tunicate		O		R-A	R-A
Molgula complanata	a tunicate		O-F	R-F		R-F
Molgula sp	A tunicate		C-S			C-S
Styela clava	Leathery squirt			R-O	R-C	R-C
Ciona intestinalis	Yellow ringed squirt			F	F-C	F-C
Polycarpa scuba	a tunicate		O		F	F
Dendrodoa grossularia	Baked bean squirt		R-F		F	R-F
Diplosoma spongiforme	Sponge squirt		R-C	A	F	R-A
Diplosoma listeri	a tunicate		O-F		F	O-F
Botrylloides leachii	a tunicate		O	F	O	O-F
Botrylloides violaceous	An invasive tunicate			A		A
Botrylloides diegensis	An invasive tunicate		F			F
Botryllus schlosseri	Star squirt		O	C		O-C

Scientific name	Common name	Lincs	Norfolk	Suffolk	Essex	East Anglia
Didemnum maculosum	Snowflake squirt		F-C		O	O-C
Lissoclinum perforatum	a tunicate		R-F		F	R-F
Polyclinum aurantium	a tunicate		O-F		F	O-F
Clavelina lepadiformis	Lightbulb sea squirt		O-A	C		O-A
Corella eumota	An invasive tunicate			R-O		R-O
Archidostoma aggregatum	A tunicate		F-C			F-C
Polysyncraton bilobatum	A tunicate		R-C			R-C
Pyura sp	A tunicate		F			F
Morchellium argus	A club squirt		R-F			R-F
Aplidium glabrum	A tunicate		R-F			R-F
Aplidium turbinatum	A tunicate		R-F			R-F
Aplidium pallidum	A tunicate		R			R
Distaplia rosea	A tunicate		R-O			R-O
Pycnoclavella stolonialis	Pinhead squirt		R-O			R-O
		1	**26**	**10**	**13**	**30**
Pisces	**Fishes**					
Scyliorhinus canicula	Small spotted cat shark		R			R
Anguilla anguilla	European eel		R			R
Syngnathus sp	Pipefish sp		O-F			O-F
Syngnathus acus	Greater pipefish	O	R		R	R-O
Entelurus aequeorus	Snake pipefish		R			R
Callionymus reticulatus	Reticulated dragonet		O-F			O-F
Callionymus lyra	Common dragonet	O	R-F			R-F
Pomatoschistus sp	Sand goby	O	O-F			O-F
Pomatoschistus minutus	Sand goby		F		O-F	O-F
Pomatoschistus microps	Common goby			F		F
Pomatoschistus pictus	Painted goby		O-C			O-C
Gobius niger	Black goby				F	F
Gobiusculus flavescens	Two spot goby		R-C		O	R-C
Lipophrys pholis	Shanny		R-O			R-O
Aphia minuta	Transparent goby		O-F			O-F
Agonas cataphractus	Pogge		R			R
Echiicthys vipera	Lesser weever		O-F			O-F
Trachinus draco	Greater weever		O			O
Belone belone	Garfish			R		R
Taurulus bubalis	Long spined sea scorpion		O-F			O-F
Myoxocephalus scorpius	Short spined sea scorpion		R			R

Scientific name	Common name	Lincs	Norfolk	Suffolk	Essex	East Anglia
Gasterosteus aculeatus	3 spined stickleback			F-C		F-C
Pollachius pollachius	Pollack		R-F			R-F
Dicentrarchus labrax	Sea bass		F			F
Trisopterus luscus	Bib		R-C			R-C
Gadus morhua	Cod		R			R
Mullus surmuletus	Grey mullet		R			R
Pholis gunnellus	butterfish		R-O			R-O
Crenilabrus melops	Corkwing wrasse		O-C			O-C
Ctenolabrus rupestris	Goldsinny		O			O
Labrus bergylta	Ballan wrasse		O-F			O-F
Liparis sp	Sea snail		R			R
Liparis montagui	Montague's sea snail		O			O
Ciliata mustela	5 bearded rockling		R			R
Ammodytes sp	Sand eel		F			F
Eutriglia gurnardus	Grey gurnard		R-O			R-O
Pleuronectes flesus	Flounder		R-O			R-O
Pleuronectes platessa	Plaice		R-O			R-O
Limanda limanda	Dab		R-F			R-F
		3	**35**	**3**	**4**	**39**
Aves	**Birds**					
Phalacrocorax carbo	cormorant		O			
		0	**1**	**0**	**0**	**1**
Algae	**Seaweeds**					
Ulva sp	Sea lettuce		O	O	C	O-C
Ulva lactuca	Sea lettuce		R-F	O-F	F-C	R-C
Ulva linza	Gut weed		F-A	O-F	C	O-A
Ulva rigida	Sea lettuce			O		O
Chaetomorpha linum	Brick weed		O-C		R-C	R-C
Chaetomorpha sp	A brickweed			C-S		C-S
Cladophora rupestris	Rope weed		O-C		C	O-C
Cladophora pellucida	Pellucid green branched weed		F			F
Bryopsis plumosa	Mossy feather weed		R-F	F		R-F
Bryopsis hypnoides	Mossy feather weed		O			O
Derbesia marina	Silky thread weed		O	O		O
Diatoms	diatoms		S		C	C-S
Sargassum muticum	Japanese wireweed				R-C	R-C
Dictyota dichotoma	Brown fanweed		F-C		O	O-C
Taonia atomaria	Dotted peacock weed		O-C			O-C
Cutleria multifida	Cutler's many cleft weed		F-A			F-A
Phaeophyceae	Filamentous brown		O-F	O-C		O-C
Sphacelaria sp	Small brown feather weeds			O		O
Cladostephus spongiosus	Hairy sand weed		O			O
Fucus vesiculosus	Bladderwrack		C	O-A	O-C	O-A

Scientific name	Common name	Lincs	Norfolk	Suffolk	Essex	East Anglia
Fucus spiralis	Spiral wrack		O-C			O-C
Fucus serratus	Serrated wrack		R-F			R-F
Ascophyllum nodosum	Egg wrack		F	O-A		O-A
Saccorhiza polyschides	Furbellows				O	O
Saccharina latissima	Sugar kelp			F		F
Undaria pinnatifada	Wakame			F		F
Halidrys siliquosa	Podweed		R-F			R-F
Rhodophyta	Red encrusting algae		O-C			O-C
Corallinaceae crusts	Pink encrusting algae		O-A			O-A
Corallina officianalis	Common coral weed		R-C		O	R-C
Gracilaria gracilis	Slender wartweed		O-A		O	O-A
Chondria dasyphylla	Diamond cartilage weed		F-C		O-F	O-C
Chondria coerulescens	Iridescent cartilage weed				R	R
Halurus flosculosus	Mrs Griffith's little flower		O		O	O
Halurus equisetifolius	Sea Horsetail		O-F			O-F
Chondrus crispus	Irish moss		R-C	C	O	R-C
Gymnogongrus crenulatus	Norwegian fan weed		O-F	F		O-F
Rhodophyllis divaricata	Leafy rose weed				F	F
Pterothamnion plumula	Bushy feather weed			O-F	O	O-F
Ceramium deslongchampii	A pincer weed		F	O-F		O-F
Ceramium pallidum	A pincer weed			F		F
Ceramium secundatum	A pincer weed			C		C
Ceramium echonitum	A pincer weed		F-C	F		F-C
Ceramium nodulosum	A pincer weed			F		F
Ceramium sp	A pincer weed		R-F	R-C	O	R-C
Polysiphonia stricta	Pitcher siphon weed			O		O
Polysiphonia lanosa	Wrack siphon weed		O	O-C		O-C
Polysiphonia nigra	Twisted siphon weed		R			R
Polysiphonia elongata	Elongate siphon weed		F			F
Polysiphonia fucoides	Black siphon weed			F		F
Polysiphonia sp	Siphon weed		O	F-C		O-C
Cryptopleura ramosa	Fine-veined crinkle weed		R-F			R-F
Plocamium cartilaginum	Comb weed		O-C			O-C
Plocamium maggsiae	Maggs' cockscomb		O			O
Plumaria plumosa	Soft feather weed		F	O-F		O-F
Mastocarpus stellatus	Grape pip weed			C		C
Phyllophora pseudoceranoides	Stalked leaf bearer		O	F		O-F

Scientific name	Common name	Lincs	Norfolk	Suffolk	Essex	East Anglia
Cystoclonium purpureum	Purple claw weed		O	O-C		O-C
Hypoglossum hypoglossoides	Under tongue weed		R-F			R-F
Scinaia furcellata	Scina's weed		R-O			R-O
Rhodymenia holmesii	Holme's rose weed		O-C			O-C
Rhodymenia ardissonei	Spikey rose weed		O-F			O-F
Heterosiphonia plumosa	Siphoned feather weed		O			O
Calliblepharis ciliata	Eyelash weed		O-C			O-C
Brongniartella byssoides	Brongniart's thread weed		O-F			O-F
Osmundia oederi	Flat fern weed		O-F			O-F
Osmundea sp	Fern weed		O-F			O-F
Gastroclonium reflexum	Reflexed grape weed		F-C			F-C
Drachiella heterocarpa	Callused drachiella		R-O			R-O
Porphyra sp	Lava		R			R
Halarachnion ligulatum	Sea spider weed		O-F			O-F
Scottera nicaeensis	Shaded weed		F			F
Polyides rotundus	Discoid fork weed		O-C			O-C
Furcellaria lumbricalis	Clawed forkweed		O-F			O-F
Rhodophyllis divericata	Leafy rose weed		R			R
Ahnfeltia plicata	Black scour weed		F			F
Rhodoflamniella floridula	Sand binder		F			F
Antithamnionella sp	A red algae		C			C
Delesseria sanguinea	Sea beech		R			R
		0	**63**	**30**	**19**	**79**
Others	**Other phyla**					
Halichoerus grypus	Grey seal		R			R
Mites	mites		F			F
Pedicellina sp	Entoprocts		F	R-F	A	R-A
Pycnogonidae	White sea spider		R	R	O	R-O
Pycnogonidae	Red sea spider		R-O			R-O
Pycnogonidae	Brown sea spider				R	R
Halyphysema tumanowiczii	a foraminiferan		O-A		F	O-A
Bacteria	Bacterial mat				O	O
Pleurobrachia pileus	Sea gooseberry		R-O	O		R-O
Cyanobacteria	Blue-green algae			C		C
		0	**7**	**4**	**5**	**10**
Total		**49**	**356**	**104**	**119**	**414**

Acknowledgements

This report has been written by Dawn Watson based on Seasearch Survey records made by Dawn Watson, Rob Spray, Jon Chamberlain and Simon Parker, Observation records made by Michael Southwood, Mick Bateman, Atanas Petrov, Ben Moore and Sascha Ley, , and intertidal survey records made by Dawn Watson and Michael Southwood. All photographs in this report were taken by Dawn Watson and Rob Spray.

Seasearch would like to thank the volunteer divers and intertidal surveyors for their records, and NT Orford, NBIS, The Wildlife Trusts, NE, NWT, NNNS and many others for all their help and support.

Report published by Marine Conservation Society for Seasearch **www.seasearch.org.uk**