

Seasearch East Report 2016

This report summarises the activities of Seasearch in East Anglia during 2016



Rob Spray and Dawn Watson - Seasearch East 2016

Star of 2016, previously rare Tompots (*Parablennius gattorugine*) were seen on most Norfolk dives in 2016



Two species of stalked jelly were seen this year, this one is *Calvadosia campanulata* at East Runton

2016 has been an interesting year for East Anglia, with lots of new species seen and new sites explored. Sightings of *Sabellaria spinulosa* have continued to increase and the tiny colonies seen in 2015 are all expanding. Notable species include Tompot blennies, which have gone from a single individual seen every couple of years to at least one on every reef dive off Norfolk, and one individual off Suffolk. They have all been subadult, so it will be interesting to see how they survive the winter. Two species of stalked jelly were recorded, generally on the meadows of *Halidrys siliquosa* which are becoming quite frequent off East and West Runton, but also once on *Plocamium cartilagineum*. Several new species of seaweed have been recorded.

The diving season was a little shorter than 2015, but a record number of forms (194, compared to 168 in 2015) were received as several keen new volunteers have really thrown themselves into the project, including some who have managed to qualify as Surveyors, hugely increasing the value of the data they provide.

The following pages explore each of the counties dived in more detail, working from North to South.

Cambridgeshire



A single species Observation form was received from the River Nene in Peterborough after a Common seal was seen catching fish.

Lincolnshire and the Wash

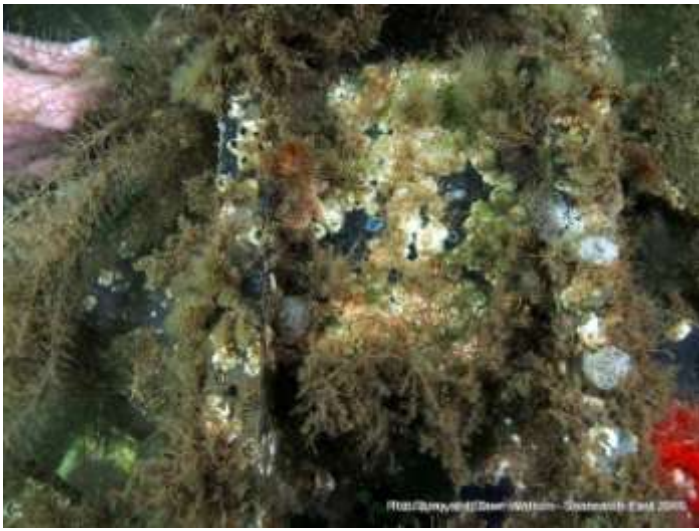


Wash dive sites

Since the Wash is quite a different habitat to the open coast of Norfolk, it was decided to include forms from Hunstanton and the the 'Norfolk' parts of the Wash in with the 'Lincolnshire' Wash forms this year.

SONDE Buoy

Three days of diving were conducted with the EIFCA on the colonisation plate array attached to the SONDE buoy in the centre of the Wash, resulting in 4 Survey forms and 1 Observation form. On the first dive, it was discovered that the action of the buoy chain had caused sediment to collect around the array, so modifications were made on the second visit. A strip of 3 plates were harvested on the third day's diving in September and are now with the NHM, waiting to be put through the electron microscope for detailed bryozoan ID.



Underside of colonisation plate array in place on the seabed. Species present include eggs of Little cuttlefish, *Bugula*, *Bowerbankia*, *Macropodia* and *Facelina auriculata*



Seabed scene near SONDE buoy. *Psammechinus miliaris* make 'nests' of detritus which attract crustaceans and others

Shrimp ground drifts

An area on the South side of the Wash was proposed to the EIFCA for the trials of brown shrimp fishing gear, which would have involved trawling the seabed. 3 drift dives were done across the proposed area at approx 50m apart. Interestingly, the area had been checked with a drop camera without finding any species of note. The dives revealed that the whole area contained *Sabellaria spinulosa* reef in discrete clumps, which the drop camera had managed to neatly avoid.



Tidy clump of *Sabellaria spinulosa* on shrimp ground drift.

Thief sand

A single Observation form was received from a low tide survey of this intertidal sandbank. Several common species were found on a site which would otherwise not have been surveyed.

Hunstanton

5 low tide Observation forms were received for Hunstanton beach, including one done as a group survey for a marine ID course at the Hunstanton Sealife Centre, who kindly hosted the event.



A surprise hazard on dives in the Wash – Shore crabs (*Carcinus maenas*) were very keen to tag along. This one is on a DSMB string, but divers often surfaced with a novel 'hat'!

Norfolk (excluding the Wash)

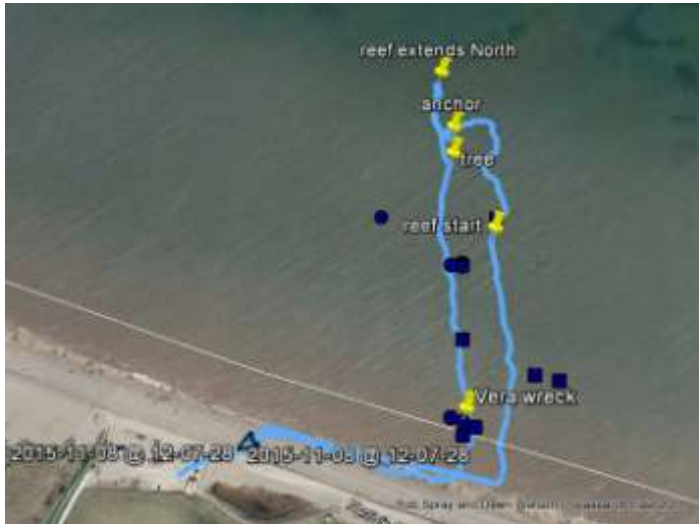
This section covers all the records taken between Burnham Overy in the NW and Overstrand in the SE, and a couple of wreck sites off Sea Palling.

Burnham Overy

A single species record was received from a dog walker who found a Sunfish (*Mola mola*) on the

beach. These have been much less common than in previous years.

Cley



Typical forest dive. The furthest explored point is 430m out.

Cley was very popular with divers during 2016, with 21 forms received for the Vera wreck and the fossilised forest another 350m out. The forest was further explored to the North and West of the areas explored in 2015 and lines were laid between some of the more interesting features. A buoy was temporarily put on the huge anchor set into the reef so that divers could save air by surface swimming to it.



Lobster lurking under the 3m high anchor on the wood reef

A very large area of cobbles and flint boulders surrounding the wreck of the Vera and extending out in patches until level with the wood reef was also explored further.

The fine sand at Cley is also full of life, with very large beds of sand masons, razor shells and lugworms. It is also home to several species not often encountered elsewhere off Norfolk – juvenile grey gurnards, red

mullet and greater pipefish are often present, as well as Pennant's swimming crab and masked crabs.



Typical wood reef community. Small holes in the wood also contain porcelain crabs, hairy crabs and piddocks.



The underside of the reef is home to many small Bib and huge Common lobsters

Salthouse

Only two dives were done at Salthouse in 2016, mainly due to the difficulty in parking reasonably close after winter storms filled the car park with shingle. There had been quite a bit of sand

movement, but habitats and species were much the same as before.

Weybourne

The wreck of the Rosalie to the West of Weybourne remains very popular, but volunteers experimented during 2016 with drifting to and from the wreck with the tides. This resulted in some very long (more than 500m) and interesting drifts over vast sand mason beds, boulder plains and scattered wreckage far from the main site.



Dive sites at Weybourne – the Rosalie wreck and chalk reef, with drifts between and beyond.

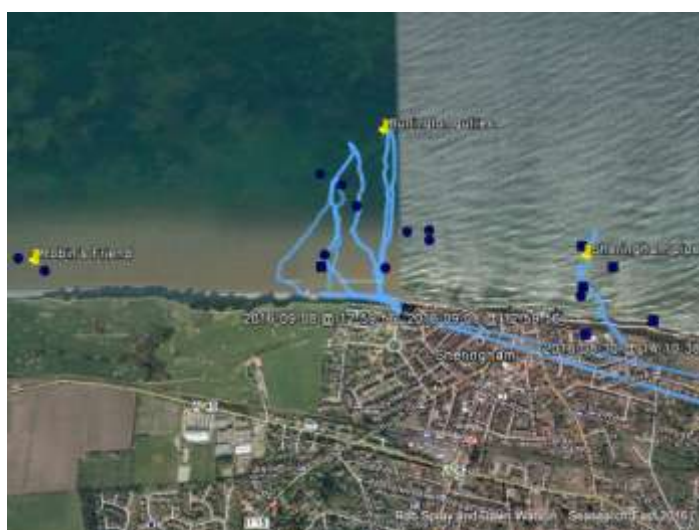
The chalk plain to the East was thoroughly explored and the old telegraph cable running to the NE was followed until it vanished into the encroaching waves of mobile sand some 300m out.

Spalla Gap

Spalla Gap is a site which can only be reached with the permission of Sheringham Park NT staff, and is also only really suitable for 4WD vehicles when the weather has been dry for a while. As a consequence, only one dive was completed in 2016. However, the effort involved was well worth it, with a pristine site almost never dived by others. An adult Grey gurnard (*Eutriglia gurnardus*) was seen and it was noticed that the invasive squirt *Perophora japonica* had become frequent in the red algae.



Mixed algae and *Diplosoma spongiforme* at Spalla Gap
Sheringham



Sheringham sites – Robin's Friend to the West, The Esplanade and Burlington gullies and then the Pipe to the East.

34 forms were received for Sheringham in 2016, with many recording subadult Tompot blennies (*Parablennius gattorugine*) on the chalk reef.



Tompot blenny with the blue spot on the dorsal fin typical of subadults



Pirimela denticulata (a tiny cute crab) was recorded at Sheringham for the first time in 2016

The reef to the West of town known as Robin's Friend was only explored as low tide shore surveys, but The area off the Esplanade containing the most rugged gullies (up to 3m high) was thoroughly explored.

The area to the East of the town around an Edwardian sewer pipe has been proposed by Seasearch East as a public snorkel trail, so many dives included work to add small buoys and check for hazards, as well as the usual placement of colonisation plates. The numbers of Corkwing wrasse (*Symphodus melops*) seen on the pipe continue to rise – they were almost never seen in 2007 and are now very common on every dive.



Very large Common lobsters live in the Sheringham pipe

West Runton

6 forms were received from West Runton, including 2 rockpool surveys. Tompot blennies were seen, along with the stalked jelly *Craterolophus convolvulus* and the sponge *Suberites massa*, not previously thought to extend East of Dorset, but now recorded from Norfolk and Essex.



Typical dives at West and East Runton

East Runton

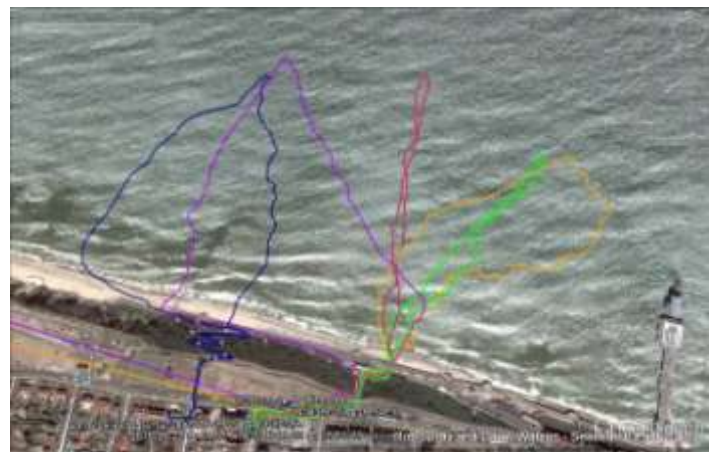
12 forms were received from East Runton, a site which had experienced a lot of sand movement over the winter. Inshore chalk and flint reef was entirely covered in fine sand waves stabilised by Sand mason worms, which attracted many crustaceans and allowed lush growth of mixed algae.

A second species of stalked jelly, *Calvadosia campanulata* was found here, see photo on page 1.



Deformed Lesser weever, *Echiichthes vipera* seen on night dive

Cromer



Lines of exploration at Cromer during 2016

2016 was our first attempt to properly explore Cromer, having only managed one dive under the pier previously. It is not currently possible to park close to the entry point, so divers have to be prepared for a long trek, then a climb up and down steep steps with their kit!



The sponge *Dysidia pallescens* at Cromer

12 forms were received including 4 low tide beach surveys. Each of the dives were done carrying a DSMB with attached GPS to help with mapping the site. The sponge *Dysidia pallescens* was seen on 3 separate dives, having only been recorded twice in Norfolk before. Tompot blennies were also seen on most dives.

The site was markedly different from those to each side, with chalk outcrops alternating with very large flint boulders and paramoudra, often in loose piles. Pink encrusting algae was the dominant cover and most other animal turf was very tough, suggesting that the flints are mobile during the winter.

Overstrand



Overstrand dives during 2016

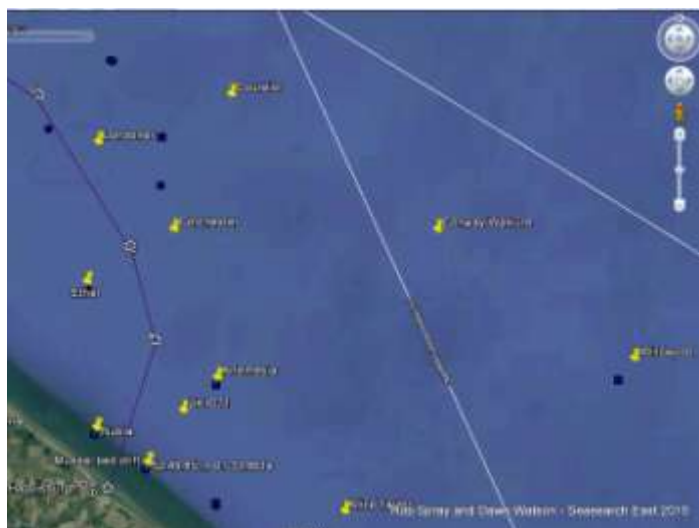


Dover sole, *Solea solea* at Overstrand

Overstrand visibility tends to clear late in the season and parking is limited. Diving was only possible until October in 2016, so only 7 forms were received for Overstrand. Efforts were concentrated on an area to the East of the boat slip, many dives having been made to the West in previous years. Notable species seen included the squirt *Pycnoclavella stolonialis* and the snakes head bryozoan *Aetea anquina*.

Further Southeast – wreck dives

11 wreck sites between Sea Palling and Mundesley were dived during 2016. Most were recorded as containing only expected species, but several were



Wreck dive sites (yellow pins) off Happisburgh. The purple line to the left is the Cromer Shoal MCZ

described as surrounded by live *Sabellaria spinulosa* gravel, presumably trawled up from nearby seabed. The drift over the area which had previously been a blue mussel bed found low lying *Sabellaria spinulosa* reef.



Polymastia boletiformis in *Sabellaria spinulosa* gravel near the Alice Taylor wreck

Suffolk

2016 was a very good year for Suffolk, with a brief period in September when visibility at the shore got up to a mighty 1-2m, a vast improvement over the usual 'drinking chocolate' seen locally. 3 new sites were dived on the coast and an extra river site added.



Suffolk dive sites (yellow pins)



Sample of *Chartella papyracea* from Lowestoft

Lowestoft

A single site was dived off the beach outside the harbour wall. Visibility was only 0.5m, but it was enough to see small *Sabellaria spinulosa* reefs and a wall dominated by the bryozoan *Chartella papyracea*, a species largely absent from the East coast of the UK on the NBN.

Aldeburgh

A single site was dived at Aldeburgh with divers setting off at 90 degrees to one another to cover maximum ground. The seabed was repeating narrow ribbons of coralline crag with almost liquid silt in the troughs between. The crag was angled so that each band had a high edge with many bryozoans and hydroids. The visibility reached a maximum of 1m 100m from the shore. We have been trying to dive this site for 4 years, so are very happy!



Bryozoan and hydroid turf on coralline crag off Aldeburgh

Orfordness

9 forms were received for Orfordness in 2016. No new sites were explored, but we continued to expand

our knowledge of the visitor pontoons and two saline lagoons on the Ness. A broad clawed porcelain crab (2nd record for East Anglia) was found on colonisation plates on the visitor pontoons and moon jelly polyps and a 3 spined stickleback were found in the lagoons.



Broad clawed porcelain crab, *Porcellana platycheles*

Ramsholt

A single form was received from the underside of a yacht moored at Ramsholt. As expected, the animal turf was dominated by *Jassa* and *Tubularia indivisa*, being grazed by many nudibranchs.

Levington



Hincksia granulosa under the microscope

A single trip was made to Levington marina and a survey made by hanging over the side to photograph and collect samples. 3 new species of algae were found; *Hincksia granulosa*, *Polysiphonia fibrillosa* (only one record for East Anglia from 1937) and *Dyctosiphon foeniculaceus* (no records for the East coast below Yorkshire). The worm *Platynereis dumerilii* was also a new record. As in previous years, the mixed algae were dominated by the invasive kelp Wakame and a variety of squirts including a few invasives dominated the animal turf.

Felixstowe

This was another Suffolk site not previously dived by Seasearch. The seabed at first appeared to be very flat sand, but was actually very hard London clay with a very thin partial veneer of sand. The clay was full of *Barnea candida* and the site was dotted with very large boulders, each completely coated in live *Sabellaria spinulosa*. The boulders were home to a good selection of other animals including the nudibranch *Thecacera pennigera* and the tiny sponge *Clathrina lacunosa*



Tiny *Clathrina* (was *Guancha*) *lacunosa* sponge on a *Sabellaria spinulosa* community.

Essex

Essex dives were very frustrating in 2016 and many planned trips fell through due to weather or boat problems. Two dives were made with the Colchester BSAC club from Wrabness on the river Stour, a mid channel drift and a shore dive onto boat moorings. The drift dive was very pleasant with at least 6m visibility and a rolling seabed from 5-10m deep, covered in meadows of peacock fanworms and piles of slipper limpets, all providing anchorage for a range of seaweeds and animals.



Peacock fanworms, *Sabella pavonina* supporting a variety of other animals



The sponge *Suberites massa*, previously only recorded from 3 sites on the channel coast

Other activities

Television appearance and snorkel trail



Brightly coloured TV snorkelling

The proposed snorkel trail at Sheringham has taken a lot of work to bring all the interested parties together, but now seems certain to go ahead with the blessing of the town and district councils. A trial run with David Whitely from the BBC local 'Inside Out' documentary team and some happy volunteers was filmed during the summer.

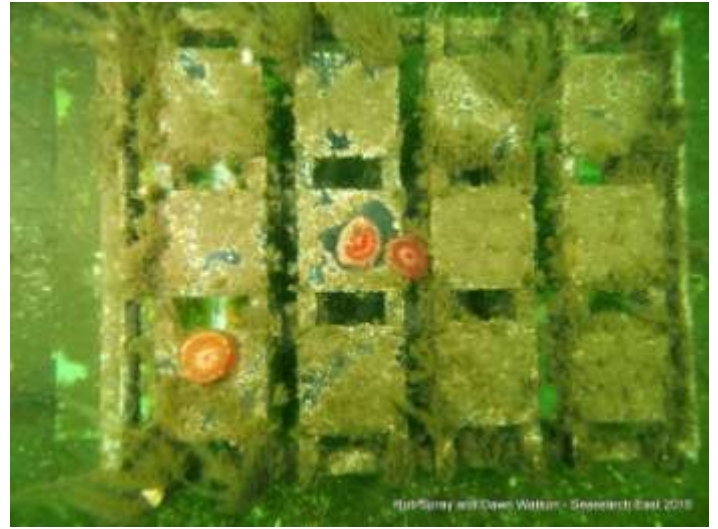
There has been much interest from local swimming clubs and visitors to the town and a voluntary code of practice for snorkellers has been drawn up. We are in talks with the district council about putting up signage on the Promenade and with Cromer councillors about a similar venture there.

Courses

We ran a well attended Observer course Essex in June and another in Sheringham in early July and managed course dives in Sheringham, Cley and Weybourne.

Our first surveyor course was run in August at Sheringham, with help from the new National Coordinator and two Marine ID courses followed; one for divers in Cley and one for rock poolers in Hunstanton.

Colonisation plates



Top view of Wash colonisation plate array

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.

Plates are removed at regular intervals for examination, drying and sending on to the NHM for electron microscopy when the workload allows – we are currently in talks with Mary Spencer Jones about a possible postgraduate project involving the plates.

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 Norfolk Observer course in 2016.

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.



Juvenile Grey gurnard, *Eutriglia gurnardus*



East Runton chalk gully with the sponge *Oscarella sp*



Nut crab, *Ebalia tumefacta*



Traditional angry lobster

Species records

The appendix below lists all the species recorded by Seasearch East volunteers during 2016, with a grand total of 400.

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

Scientific name	Common name	Lincs and Wash	Norfolk	Suffolk	Essex	East Anglia
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Porifera	Sponges					
<i>Halichondria panicea</i>	Breadcrumb sponge	O	R-C	R-O	F	R-C
<i>Halichondria bowerbankii</i>	A sponge		R-O	R-O	F	R-F
<i>Oscarella sp</i>	A sponge		R-F			R-F
<i>Sycon ciliatum</i>	Vase sponge	O	O-A	O	O-A	O-A
<i>Grantia compressa</i>	Purse sponge		R-F			R-F
<i>Haliclona oculata</i>	Mermaid's glove		R-O	O-F	O	R-F
<i>Haliclona viscosa</i>	A sponge		R-F			R-F
<i>Haliclona cinerea</i>	A sponge		R-F			R-F
<i>Halisarca dujardini</i>	A sponge		R-F			R-F
<i>Raspailia ramosa</i>	Chocolate fingers sponge		R-O			R-O
<i>Cliona celata</i>	Boring sponge		R-F		O	R-F
<i>Amphilectus fucorum</i>	Shredded carrot		R-C		O	R-C
<i>Leucosolenia sp</i>	Spikey lace sponge		R-F	F	F	R-F
<i>Porifera indet</i>	Yellow crust		R-F	R		R-F
<i>Porifera indet</i>	Peach crust		F-C			F-C
<i>Porifera indet</i>	Orange crust		O-C			O-C
<i>Dysidea fragilis</i>	Goosebump sponge		R-F		O	R-F
<i>Dysidia pallescens</i>	Pink goosebump		R			R
<i>Clathrina coriacea</i>	Lace sponge		R			R
<i>Clathrina lacunosa</i>	A sponge			F		F
<i>Aplysilla sulphuria</i>	A sponge		R			R
<i>Porifera indet</i>	Yellow 'shredded carrot'		O-F			O-F
<i>Porifera indet</i>	Blue 'shredded carrot'		R-O			R-O
<i>Steliger rigida</i>	A sponge		O			O
<i>Hymedesmia sp</i>	Norfolk purple sponge		R-F			R-F
<i>Polymastia boletiformis</i>	Hedgehog sponge		R			R
<i>Polymastia penicillus</i>	Chimney sponge		R-O			R-O
<i>Suberites ficus</i>	Sea orange		R-C			R-C
<i>Suberites massa</i>	A sponge		O-C		O-C	O-C
		2	28	7	9	29

Cnidaria	Hydroids and anemones					
<i>Actinia equina</i>	Beadlet anemone	R-O	R-F			R-F
<i>Metridium senile</i>	Plumose anemone	R-O	R-S			R-S
<i>Sagartia troglodytes</i>	An anemone	R-F	R-C	R-C	F-C	R-C
<i>Sagartia elegans</i>	Elegant anemone	R-O	R-A	F		R-A
<i>Urticina felina</i>	Dahlia anemone	R-F	R-C	O	F	R-C
<i>Urticina eques</i>	Horseman anemone				O-F	O-F
<i>Diadumene cincta</i>	Orange anemone		R-C	C-A		R-A
<i>Cerianthus lloydii</i>	Burrowing anemone		R			R
<i>Tubularia indivisa</i>	Oaten pipes	R-F	R-A	C-S		R-S

Scientific name	Common name	Lincs and Wash	Norfolk	Suffolk	Essex	East Anglia
<i>Tubularia larynx</i>	Oaten pipes	C	R	A		R-A
<i>Hydractinia echinata</i>	Hermit fur	R-F	R-F			R-F
<i>Sertularia cupressina</i>	White weed	O-C	O-C			O-C
<i>Eudendrium sp</i>	A hydroid	R-C	R-C		O	R-C
<i>Eudendrium arbusculum</i>	A hydroid	O	F			O-F
<i>Eudendrium ramosum</i>	A hydroid		C			C
<i>Abietinaria abietina</i>	A hydroid	O	R-O			R-O
<i>Halecium halecinum</i>	A hydroid	O	R-O			R-O
<i>Hydrallmania falcata</i>	Helter skelter hydroid	R-C	O		R-O	R-C
<i>Clytia hemisphaerica</i>	A hydroid		R-S		O	R-S
<i>Plumularia setacea</i>	A feathery hydroid	O-C	O-A	O-F	O-F	O-A
<i>Obelia dichotoma</i>	A hydroid	F-A	R-F			R-A
<i>Obelia geniculata</i>	Kelp fur			F		F
<i>Garveia nutans</i>	A hydroid		O			O
<i>Laomedea flexuosa</i>	A feathery hydroid			F		F
<i>Kirchenpaueria similis</i>	A feathery hydroid		O-F			O-F
<i>Kirchenpaueria pinata</i>	A feathery hydroid		R-F			R-F
<i>Hartlaubella gelatinosa</i>	A hydroid	O	R			R-O
<i>Coryne eximia</i>	A hydroid		R-O	R		R-O
<i>Dynamena pumilla</i>	A hydroid		R-C			R-C
<i>Nemertesia antenina</i>	Antenna hydroid	R-O	R-F	R		R-F
<i>Nemertesia ramosa</i>	Antenna hydroid		R-O			R-O
<i>Sertularella rugosa</i>	A hydroid		O-C	O-C	R-C	R-C
<i>Aequorea sp</i>	A hydroid	R	R-F	R		R-F
<i>Alcyonium digitatum</i>	Dead mens fingers		O-C	O-F		O-C
<i>Aurelia aurita</i>	Moon jelly	F	R-F	R-C	F	R-C
<i>Chrysaora hysoscella</i>	Compass jelly	R	R-F			R-F
<i>Cyanea capillata</i>	Lion's mane jelly	R-O	O-F			R-F
<i>Cyanea lamarkii</i>	Blue jelly		R			R
<i>Craterolophus convolvulus</i>	A stalked jelly		R			R
<i>Calvadosia campanulata</i>	A stalked jelly		R			R
		22	37	15	9	40

Annelida

Segmented worms

<i>Arenicola marina</i>	Lugworm	R-C	O-A	R-O	O	R-A
<i>Arenicola defodiens</i>	Lugworm	F	O-C			O-C
<i>Sabella pavonina</i>	Peacock fanworm	R-C	R-A	R-F	R-A	R-A
<i>Aphrodita aculeata</i>	Sea mouse	R-C				R-C
<i>Lanice conchilega</i>	Sandmason worm	R-A	R-S	O-S		R-S
<i>Harmothoe sp</i>	A scaleworm		R	R-O		R-O
<i>Harmothoe impar</i>	A scaleworm	R				R
<i>Polydora ciliata</i>	A tubeworm	O	R-S		C	R-S
<i>Amphitrids gracilis</i>	A segmented worm	R				R
<i>Eupolymna nebulosa</i>	Strawberry worm		F	R		R-F
<i>Phyllodoce</i>	A segmented worm				R	R
<i>Syllid sp</i>	A segmented worm			R		R
<i>Salmacina dysteri</i>	Coral worm		R-F			R-F
<i>Spirobranchus</i>	Keel worms	O-F	R-A	O		R-A

Scientific name	Common name	Lincs and Wash	Norfolk	Suffolk	Essex	East Anglia
<i>Sabellaria spinulosa</i>	Ross worm	A	R-C	C-S		R-S
<i>Spirorbis</i>	Spiral worm		O-F			O-F
<i>Nephtyidae</i>	A catworm		R			R
<i>Nereis sp</i>	A ragworm			R		R
<i>Eulalia viridis</i>	Green paddle worm		R-O			R-O
<i>Hediste diversicolour</i>	Ragworm	R		R-O		R-O
<i>Platynereis dumerilii</i>	A segmented worm			R		R
<i>Myrianida pinnigera</i>	A segmented worm		R			R
<i>Cirratulus cirratus</i>	A segmented worm		O-F		O-F	O-F
<i>Tubulanus annulatus</i>	Football jersey worm		R-O			R-O
<i>Oerstadia dorsalis</i>	A flatworm			R-O		R-O
<i>Tetrastemma melanocephalum</i>	A flatworm			O		O
<i>Platyhelminthes sp</i>	A flatworm			O		O
		11	16	14	5	27

Crustacea **Barnacles, crabs, shrimp and lobsters**

<i>Cirripedia</i>	Barnacles	R-A	R-S	O-S	O-F	R-S
<i>Semibalanus balanoides</i>	A barnacle		F			F
<i>Cancer pagurus</i>	Edible crab	R-O	R-C	R-F	R	R-C
<i>Carcinus maenas</i>	Shore crab	R-F	O-C	R-C	F	R-C
<i>Necora puber</i>	Velvet swimming crab	R	R-C	R-F		R-C
<i>Pilumnus hirtellus</i>	Hairy crab		O			O
<i>Portunus latipes</i>	Pennant's swimming crab		R-O			R-O
<i>Pirimela denticulata</i>	A crab		R			R
<i>Liocarcinus depurator</i>	Harbour crab	R-F	R-F	R-O		R-F
<i>Liocarcinus corrugatus</i>	Corrugated crab		O			O
<i>Corystes cassevelauneus</i>	Masked crab		R-O			R-O
<i>Hyas araneus</i>	Sea toad	O	R-F			R-F
<i>Inachus sp</i>	A spider crab	O	R-C		O	R-C
<i>Macropodia sp</i>	Long legged spider crab	R-F	R-F	R-O		R-F
<i>Pisidia longicornis</i>	Long clawed porcelain crab	O	R-F	O		R-F
<i>Porcellana platycheles</i>	Broad clawed porcelain crab			R		R
<i>Ebalia tumefacta</i>	Nut crab		R			R
<i>Pagurus bernhardus</i>	Common hermit crab	R-C	O-F	O		R-C
<i>Paguridae</i>	Hermit crab	R-C	R-C	O		R-C
<i>Galathea intermedia</i>	A squat lobster	F	O-F			O-F
<i>Galathea squamifera</i>	Brown squat lobster		R-A			R-A
<i>Homarus gammarus</i>	Common lobster		R-C	R		R-C
<i>Palaemon serratus</i>	Common prawn		R-F	O		R-F
<i>Palaemon varians</i>	Lagoon prawn		R	R-F		R-F
<i>Palaemon elegans</i>	Rockpool prawn		O-F			O-F
<i>Crangon crangon</i>	Brown shrimp	O-C	R-C	O-F		R-C
<i>Pandalus montagui</i>	Northern prawn	O-C	R-O	F		R-C
<i>Eulalus sp</i>	A shrimp		O			O

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<i>Eualus cranchii</i>	A shrimp		O			O
<i>Hippolytes varians</i>	Chameleon prawn	O	O-F			O-F
<i>Caprella sp</i>	Skeleton shrimp	O-F	O-C	O-F	C	O-C
<i>Mysida sp</i>	Mysid shrimps		O-C	F	R	R-C
<i>Gammarid</i>	A shrimp	R	R	O-F		R-F
<i>Iphimedia obesa</i>	An amphipod		R			R
<i>Corophium volutator</i>	An amphipod			O-S		O-S
<i>Jassa sp</i>	An amphipod	O-S	O-S	F-A		O-S
<i>Idotea sp</i>	An isopod			O-A		O-A
<i>Idotea chelipes</i>	An isopod			O-A	R	R-A
<i>Idotea linearis</i>	An isopod	O	R-F			R-F
<i>Idotea neglecta</i>	An isopod		R			R
<i>Doridicola sp</i>	Nudi parasite	R				R
		20	36	22	7	41

Mollusca	Molluscs					
<i>Polyplacophora</i>	Chitons	R	O			R-O
<i>Lamelaria perspicua</i>	A mollusc		F			F
<i>Elysia viridis</i>	Solar powered slug		R			R
<i>Doto sp</i>	A nudibranch		R-F			R-F
<i>Doto hydrallmaniae</i>	A nudibranch	F				F
<i>Doto millbayana</i>	A nudibranch		O-F			O-F
<i>Doto pinnatafidita</i>	A nudibranch		R-F			R-F
<i>Cuthona gymnota</i>	A nudibranch		R-O	O-F		R-F
<i>Eubranchus pallidus</i>	A nudibranch		O			O
<i>Eubranchus farrani</i>	A nudibranch		O			O
<i>Eubranchus tricolor</i>	A nudibranch		R-F			R-F
<i>Nudibranch sp</i>	Sea slug eggs		O	R-O	O	
<i>Dendronotus frondosus</i>	Xmas tree sea slug	R	R			R
<i>Thecacera pennigera</i>	A nudibranch			R-O		R-O
<i>Ancula gibbosa</i>	A nudibranch		R	R		R
<i>Coryphella brownii</i>	A nudibranch		R-O			R-O
<i>Coryphella lineata</i>	A nudibranch		R-O			R-O
<i>Janolus cristatus</i>	Crystal slug	R	R-O			R-O
<i>Onchidoris bilamellata</i>	A nudibranch		R-C			R-C
<i>Acanthodoris pillosa</i>	A nudibranch	R	R-F			R-F
<i>Doris pseudoargus</i>	Sea lemon		R			R
<i>Facelina bostoniensis</i>	A nudibranch		R			R
<i>Facelina auriculata</i>	A nudibranch	O		F		O-F
<i>Limacea clavigera</i>	A nudibranch		R			R
<i>Polycera faeroensis</i>	A nudibranch		R			R
<i>Palio nothus</i>	A nudibranch		R-C			R-C
<i>Flabelina pedata</i>	Violet sea slug	R	R-F			R-F
<i>Aeolidia papillosa</i>	A nudibranch		R-O			R-O
<i>Aeolidia glauca</i>	A nudibranch		R			R
<i>Aeolidia filomenae</i>	A nudibranch		O			O
<i>Hydrobia neglecta</i>	A mud snail			F-A		F-A
<i>Trivia monacha</i>	Cowrie		R			R

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<i>Crepidula fornicata</i>	Slipper limpet	R-F	R-F		R-A	R-A
<i>Gibbula cineraria</i>	Grey topshell	O	R-C	R	O	R-C
<i>Caliostoma zizyphinum</i>	Painted topshell	R-O	R-F	O		R-F
<i>Hinia reticulata</i>	Netted whelk		O-C			O-C
<i>Buccinum undatus</i>	Common whelk	R-A	O-F		O	R-A
<i>Littorina saxatilis</i>	Rough periwinkle	R-O	R-F		F	R-F
<i>Littorina obtusata</i>	Flat periwinkle		R			R
<i>Rissoa parva</i>	A gastropod	R	F-A	R		R-A
<i>Nucella lapillus</i>	Dog whelk	O	O-F	R		R-F
<i>Tectura virginia</i>	White tortoiseshell limpet		R-O			R-O
<i>Patella vulgaris</i>	Common limpet		R-O	O		R-O
<i>Mytillus edulis</i>	Edible mussel	R-S	R-O	R-A		R-S
<i>Cerastoderma edule</i>	Edible cockle	O				O
<i>Cerastoderma glaucum</i>	Lagoon cockle			F-C		F-C
<i>Crassostrea gigas</i>	Pacific oyster			R-O	F	R-F
<i>Ostrea edulis</i>	Native oyster		R	O	O	R-O
<i>Mercenaria mercenaria</i>	Hard clam		R			R
<i>Barnea candida</i>	White piddock		R-A	C-S		R-S
<i>Ensis arcuatus</i>	Razor shell	F	F-S	S		F-S
<i>Sepiola atlantica</i>	Little cuttlefish	R-O	R-O	R		R-O
<i>Loligo sp</i>	Squid eggs		R-O			R-O
<i>Alloteuthis subulata</i>	Small squid eggs	R-O	R-O			R-O
		17	47	18	7	54

Bryozoa **Sea mats and sea mosses**

<i>Bryozoa</i>	Encrusting bryozoan indet		R-A	O-A		R-A
<i>Conopeum reticulatum</i>	Encrusting bryozoan	O-F	F-C	O-C	O	O-C
<i>Conopeum seurati</i>	Encrusting bryozoan			C-A		C-A
<i>Electra pilosa</i>	Frosty sea mat	F	O-C	O-C		O-C
<i>Membranipora membranacea</i>	Kelp mat			F		F
<i>Cryptosula pallasiana</i>	Encrusting bryozoan		O			O
<i>Parasmittina trispinosa</i>	Encrusting bryozoan		O			O
<i>Escharoides coccinea</i>	Encrusting bryozoan		R			R
<i>Schizomavella linearis</i>	Encrusting bryozoan		R-C	R-F		R-C
<i>Aetea anguina</i>	Snakes head coralline		O-F			O-F
<i>Flustrellidra hispida</i>	A bryozoan				O	O
<i>Bowerbankia citrina</i>	A bryozoan	F	O-F		F	O-F
<i>Bowerbankia imbricata</i>	A bryozoan		O-C	F	O	O-C
<i>Bicellariella ciliata</i>	A bryozoan	O-F	R-C	F	R-O	R-C
<i>Flustra foliacea</i>	Hornwrack	O-C	R-C	O-C		R-C
<i>Chartella papyracea</i>	A laminar bryozoan			F-S		F-S
<i>Alcyonidium diaphanum</i>	Finger bryozoan	O-F	R-C	O-C		R-C
<i>Alcyonidium hirsutum</i>	A bryozoan	O	O			O
<i>Alcyonidium gelatinosum</i>	A bryozoan			F		F
<i>Alcyonidium mytili</i>	A bryozoan			O-C		O-C

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<i>Anguinella palmata</i>	A bryozoan	O	O	O-A	F	O-A
<i>Scrupocellaria sp</i>	A bryozoan		C	A		C-A
<i>Scrupocellaria reptans</i>	A bryozoan		R-C			R-C
<i>Scrupocellaria scruposa</i>	A bryozoan	F	O	O-F		O-F
<i>Scrupocellaria scrupea</i>	A bryozoan		O			O
<i>Vesicularis spinosa</i>	A bryozoan	F-C	F			F-C
<i>Eucratea loricata</i>	A bryozoan	O	F			O-F
<i>Bugula sp</i>	Bottlebrush bryozoan		F	R		R-F
<i>Bugula plumosa</i>	Bottlebrush bryozoan	F	R-A	R-O	R	R-A
<i>Bugula flabellata</i>	Bottlebrush bryozoan	O	R-O			R-O
<i>Bugula turbinatum</i>	Bottlebrush bryozoan		R			R
<i>Crisia denticulata</i>	A bryozoan		R-A	O-F		R-A
<i>Crisia eburnae</i>	A bryozoan	O	F-A	C		O-A
<i>Crisia sp</i>	A bryozoan		C	O		O-C
<i>Plagioecia patina</i>	A disc bryozoan		F			F
<i>Disporella hispida</i>	A disc bryozoan		R-F			R-F
		14	30	21	7	36

Echinodermata Starfish, urchins and brittlestars

<i>Ophiura albida</i>	Sand brittlestar	R-S	R-C	R		R-S
<i>Ophiura sp</i>	A brittlestar			O	O	O
<i>Ophiura ophiura</i>	Sand brittlestar		R			R
<i>Ophiothrix fragilis</i>	Common brittlestar			R	F	R-F
<i>Asterias rubens</i>	Common starfish	R-F	R-C	O-F	O	R-C
<i>Henricia sp</i>	Bloody henry		R-F			R-F
<i>Crossaster papossus</i>	Common sunstar	R-F	R-C	R-O		R-C
<i>Psammechinus miliaris</i>	Green urchin	R-C				R-C
<i>Echinus esculentus</i>	Edible urchin		R-O			R-O
<i>Echinocardium cordatum</i>	Heart urchin		O			O
		4	7	5	3	10

Tunicata Sea squirts

<i>Perophora listeri</i>	A tunicate	O-F	R-C			R-C
<i>Perophora japonica</i>	An invasive tunicate		R-F			R-F
<i>Ascidella scabra</i>	A tunicate		R	F	O	R-F
<i>Ascidia aspersa</i>	A tunicate	F	O-F	F-A		O-A
<i>Molgula complanata</i>	A tunicate		O-F	O		O-F
<i>Molgula sp</i>	A tunicate	O	R-S	O-S		R-S
<i>Styela clava</i>	Leathery squirt			R-F	O-F	R-F
<i>Ciona intestinalis</i>	Yellow ringed squirt			C	F-C	F-C
<i>Polycarpa scuba</i>	A tunicate		R-F		R-F	R-F
<i>Dendrodoa grossularia</i>	Baked bean squirt		F			F
<i>Diplosoma spongiforme</i>	Sponge squirt	O	R-A			R-A
<i>Diplosoma listerianum</i>	A tunicate		O-C		R-F	R-C
<i>Botrylloides leachii</i>	A tunicate		R-F		O	R-F
<i>Botrylloides violaceus</i>	An invasive tunicate			O		O
<i>Botrylloides sp</i>	A tunicate		O-F		O	O-F
<i>Botryllus schlosseri</i>	Star squirt	O	R-F	F	F	R-F
<i>Tridemnum cereum</i>	A tunicate		R-O		O	R-O

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<i>Didemnum maculosum</i>	Snowflake squirt		R-C			R-C
<i>Lissoclinum perforatum</i>	A tunicate		O-F		O	O-F
<i>Polyclinum aurantium</i>	A tunicate		R-F			R-F
<i>Clavelina lepadiformis</i>	Lightbulb sea squirt		R-F	F	R	R-F
<i>Corella eumota</i>	An invasive tunicate			F	O	O-F
<i>Archidostoma aggregatum</i>	A tunicate		O-C			O-C
<i>Polysyncraton bilobatum</i>	A tunicate		O-F			O-F
<i>Morchellium argus</i>	A club squirt		R-F			R-F
<i>Aplidium glabrum</i>	A tunicate		R-F			R-F
<i>Aplidium turbinatum</i>	A tunicate		R-A			R-A
<i>Aplidium fulgens</i>	A tunicate		F			F
<i>Aplidium pallidum</i>	A tunicate		O			O
<i>Distaplia rosea</i>	A tunicate		R-F			R-F
<i>Pycnoclavella stolonialis</i>	Pinhead squirt		O			O
		5	27	10	12	31

Pisces	Fishes	Lincs and Wash	Norfolk	Suffolk	Essex	East Anglia
<i>Scyliorhinus canicula</i>	Small spotted cat shark		R			R
<i>Raja sp</i>	Ray egg case	R				R
<i>Raja clavata</i>	Thornback ray		R			R
<i>Anguilla anguilla</i>	European eel		R			R
<i>Syngnathus sp</i>	Pipefish sp	O	O			O
<i>Syngnathus acus</i>	Greater pipefish		R-O			R-O
<i>Syngnathus rostellatus</i>	Lesser pipefish		R-O			R-O
<i>Callionymus reticulatus</i>	Reticulated dragonet	R-O	R-F			R-F
<i>Callionymus lyra</i>	Common dragonet	R-O	R-O			R-O
<i>Pomatoschistus sp</i>	Sand goby	R-F	R-C	R-C	F	R-C
<i>Pomatoschistus minutus</i>	Sand goby		O-F	O		O-F
<i>Pomatoschistus microps</i>	Common goby			O		O
<i>Pomatoschistus pictus</i>	Painted goby	O-F	O-F	O	O	O-F
<i>Gobius niger</i>	Black goby				O	O
<i>Gobius paganellus</i>	Rock goby		R	R		R
<i>Gobiusculus flavescens</i>	Two spot goby		R-C		O-F	R-C
<i>Lipophrys pholis</i>	Shanny	O	R-O			R-O
<i>Parablennius gattorugine</i>	Tompot blenny		R	R		R
<i>Aphia minuta</i>	Transparent goby		R-C			R-C
<i>Agonias cataphractus</i>	Pogge	R-O	R			R-O
<i>Echiichthys vipera</i>	Lesser weever		R-F			R-F
<i>Cyclopterus lumpus</i>	Lumpsucker		R			R
<i>Taurulus bubalis</i>	Long spined sea scorpion	R-O	R-F			R-F
<i>Myoxocephalus scorpius</i>	Short spined sea scorpion		R	R		R
<i>Gasterosteus aculeatus</i>	3 spined stickleback			R		R
<i>Polachius polachius</i>	Pollack		F			F
<i>Dicentrarchus labrax</i>	Sea bass		R-F			R-F
<i>Trisopterus luscus</i>	Bib		R-A			R-A

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<i>Trisopterus minutus</i>	Poor cod		R-C			R-C
<i>Gadus morhua</i>	Cod		R			R
<i>Mullus surmuletus</i>	Grey mullet		R			R
<i>Pholus gunnellus</i>	Butterfish	R	R-O			R-O
<i>Symphodus melops</i>	Corkwing wrasse		R-C			R-C
<i>Labrus bergylta</i>	Ballan wrasse		R-C			R-C
<i>Liparis sp</i>	Sea snail		R			R
<i>Liparis montagui</i>	Montague's sea snail		R			R
<i>Ammodytes sp</i>	Sand eel		R-C			R-C
<i>Hyperoplus lanceolatus</i>	Greater sand eel		F			F
<i>Eutriglia gurnardus</i>	Grey gurnard		R-O			R-O
<i>Mola mola</i>	Sunfish		R			R
<i>Pleuronectes flesus</i>	Flounder	O-F	R-O	R		R-F
<i>Pleuronectes platessa</i>	Plaice	O	R-O			R-O
<i>Limanda limanda</i>	Dab	O	R-O			R-O
<i>Microstomus kitt</i>	Lemon sole		R			R
<i>Solea solea</i>	Dover sole		R			R
		13	41	9	4	45

Aves	Birds					
<i>Phalacrocorax carbo</i>	Cormorant		R			R
		0	1	0	0	1

Algae	Seaweeds					
<i>Salicornia europa</i>	Samphire			R		R
<i>Ruppia maritima</i>	Beaked tassleweed			R		R
<i>Indet.green</i>	Very fine				F	F
<i>Ulva sp</i>	Sea lettuce	R-C	R-A	R-A		R-A
<i>Ulva lactuca</i>	Sea lettuce	F	O-C	O-C	O-F	O-C
<i>Ulva linza</i>	Gut weed	F	F-A	O-C	F	O-A
<i>Ulva rigida</i>	Sea lettuce				O	O
<i>Chaetomorpha linum</i>	Brick weed	F	O	F-C	F-C	O-C
<i>Rhizoclonium riparium</i>	Rooting green thread weed			O-C		O-C
<i>Cladophora rupestris</i>	Rope weed		R-C	R-F	O-F	R-C
<i>Acrosiphonia arcta</i>	A green algae			F		F
<i>Bryopsis plumosa</i>	Mossy feather weed		R-F	O-F	F	R-F
<i>Bryopsis hypnoides</i>	Mossy feather weed		O-F	O	O	O-F
<i>Diatoms</i>	Diatoms		R-A	A		R-A
<i>Sargassum muticum</i>	Japanese wireweed			R		R
<i>Dictyota dichotoma</i>	Brown fanweed		O-F		O	O-F
<i>Taonia atomaria</i>	Dotted peacock weed		O-C			O-C
<i>Petalonia fascia</i>	Broad leaf weed			A		A
<i>Asperococcus fistulosus</i>	Thin sausage weed			R		R
<i>Pylaiella sp</i>	Filamentous brown			O-C		O-C
<i>Cutleria multifida</i>	Cutler's many cleft weed		O			O
<i>Phaeophyceae</i>	Filamentous brown		O			O
<i>Sphacelaria sp</i>	Small brown feather weeds			O		O

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<i>Hincksia granulosa</i>	A brown algae			O		O
<i>Dictyosiphon foeniculaceus</i>	Tubular net weed			F		F
<i>Cladostephus spongiosus</i>	Hairy sand weed		O-F	O		O-F
<i>Desmarestia viridis</i>	Desmarest's green weed		R			R
<i>Pelvetia caniculata</i>	Channelled wrack		F			F
<i>Fucus vesiculosus</i>	Bladderwrack		O-A	C-A		O-A
<i>Fucus spiralis</i>	Spiral wrack	R-C	O-C			R-C
<i>Fucus serratus</i>	Serrated wrack	R-O	O-A			R-A
<i>Ascophyllum nodosum</i>	Egg wrack			C-A		C-A
<i>Undaria pinnatifida</i>	Wakame			A		A
<i>Halidrys siliquosa</i>	Podweed		R-O			R-O
<i>Rhodophyta</i>	Red encrusting algae		R-F	F		R-F
<i>Corallinaceae crusts</i>	Pink encrusting algae		O-S			O-S
<i>Corallina officianalis</i>	Common coral weed		R-C	F		R-C
<i>Gracilaria gracilis</i>	Slender wartweed		R-C		O	R-C
<i>Chondria dasyphylla</i>	Diamond cartilage weed		R-C		R	R-C
<i>Chondria coerulescens</i>	Iridescent cartilage weed				F-C	F-C
<i>Halurus flosculosus</i>	Mrs Griffith's little flower		O	O-F		O-F
<i>Halurus equisetifolius</i>	Sea Horsetail		O-F			O-F
<i>Chondrus crispus</i>	Irish moss		F-C	O-C	O	O-C
<i>Gymnogongrus crenulatus</i>	Norwegian fan weed		O-F			O-F
<i>Pterothamnion plumula</i>	Bushy feather weed			O-F		O-F
<i>Ceramium deslongchampii</i>	A pincer weed			O-F		O-F
<i>Ceramium echonitum</i>	A pincer weed		O-F			O-F
<i>Ceramium sp</i>	A pincer weed		O-C	R-F		R-F
<i>Polysiphonia stricta</i>	Pitcher siphon weed			O		O
<i>Polysiphonia nigra</i>	Twisted siphon weed			F		F
<i>Polysiphonia fibrillosa</i>	Purple siphon weed			R		R
<i>Polysiphonia fucoides</i>	Black siphon weed		O			O
<i>Polysiphonia sp</i>	Siphon weed		R-C	R-C		R-C
<i>Cryptopleura ramosa</i>	Fine-veined crinkle weed		O-C			O-C
<i>Grateloupia filicina</i>	Grateloup's fern weed		R-F			R-F
<i>Plocamium cartilagineum</i>	Comb weed		R-A	O-C	O	R-A
<i>Plumaria plumosa</i>	Soft feather weed		O			O
<i>Mastocarpus stellatus</i>	Grape pip weed			F		F
<i>Phyllophora pseudoceranoides</i>	Stalked leaf bearer			C		C
<i>Cystoclonium purpureum</i>	Purple claw weed		O	O-C		O-C
<i>Hypoglossum hypoglossoides</i>	Under tongue weed		O	R-O	R	R-O
<i>Scinaia furcellata</i>	Scina's weed		O-F			O-F
<i>Rhodymenia holmesii</i>	Holme's rose weed		O-C	O-A		O-A
<i>Rhodymenia ardissoni</i>	Spikey rose weed		O-C			O-C

Scientific name	Common name	Lincs and Wash	Norfolk	Suffolk	Essex	East Anglia
<i>Heterosiphonia plumosa</i>	Siphoned feather weed		O-C			O-C
<i>Calliblepharis ciliata</i>	Eyelash weed		O-C	O		O-C
<i>Brongniartella byssoides</i>	Brongniart's thread weed		O-F			O-F
<i>Osmundia oederi</i>	Flat fern weed		F			F
<i>Osmundea sp</i>	Fern weed		O-F			O-F
<i>Gastroclonium reflexum</i>	Reflexed grape weed		O-C			O-C
<i>Porphyra sp</i>	Laver	R	R-F	R-F		R-F
<i>Halarachnion ligulatum</i>	Sea spider weed		O-F			O-F
<i>Polyides rotundus</i>	Discoid fork weed		O-C			O-C
<i>Furcellaria lumbricalis</i>	Clawed forkweed		O-C			O-C
<i>Ahnfeltia plicata</i>	Black scour weed		O-F			O-F
<i>Erythrogloussum laciniatum</i>	Red laver				R-C	R-C
		7	52	42	16	76
Others	Other phyla					
<i>Halichoerus grypus</i>	Grey seal		R-O			R-O
<i>Phoca vitulina</i>	Common seal		R-O			R-O
<i>Pedicellina sp</i>	Entoprocts		O-F	O-C		O-C
<i>Pycnogonidae</i>	White sea spider		R	R-O		R-O
<i>Pycnogonidae</i>	Red sea spider		R-O	R		R-O
<i>Halyphysema tumanowiczii</i>	A foraminiferan		O	C		O-C
<i>Bacteria</i>	Bacterial mat		O			O
<i>Pleurobrachia pileus</i>	Sea gooseberry	R	O	R		R-O
<i>Beroe cucumis</i>	A comb jelly		R-F			R-F
<i>Phoronis hippocrepia</i>	Horseshoe worm		R			R
		1	10	5	0	10
Total		116	332	168	79	400

Acknowledgements

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