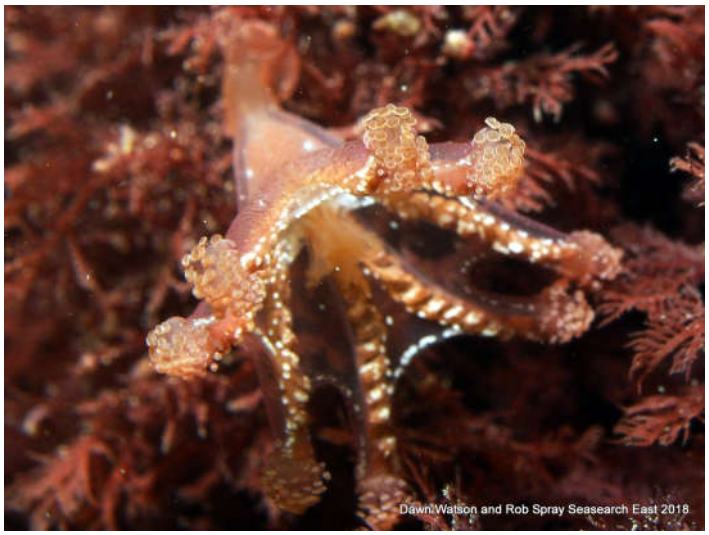
Seasearch East Report 2018

This report summarises the activities of Seasearch in East Anglia during 2018

Tiny juvenile shore crab – *Carcinus maenas* on a Dahlia anemone – *Urticina felina* off Cley in Norfolk



The stalked jellyfish *Calvadosia campanulata* on *Plocamium sp* red algae in the Sheringham chalk gullies

2018 was a much better year for Seasearch records than 2017, with better weather for longer periods meaning that solid weeks and weekends of diving were possible.

The first and last dives of the year were May 20th and November 17th respectively, with intertidal and marina surveys taking place from January 1st to December 26th! A good number of quality forms (175, of which 91 (52%) were survey forms and 84 (48%) Observer compared to 155 in 2017) were received.

Several keen new trainees worked through the Observer training process and went on to take part in dives and intertidal surveys over the season, including one pair who found our first sea hare

(*Aplysia punctata*) of the season during their first qualification survey!

'The 'Beast from the East' storm in early March had long ranging effects over the year, including a lack of adult common starfish and shore crabs until late in the season, replaced by swarms of juveniles, which gradually grew and thinned as the year progressed. Seaweeds were also severely knocked back, with smaller and sparser growth noted.

Species highlights included a first sighting of *Micrenophrys Lilljeborgii* (Norway bullhead) at West Runton and large numbers of stalked jellyfish, nut crabs and mating sea hares at several sites in Norfolk. The bullhead was particularly exciting, as only two records currently exist for Britain on the NBN Atlas, though they are clearly under-recorded.

***Micrenophrys Lilljeborgii* (Norway bullhead), a very tiny, spiky little sea scorpion**

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

Lincolnshire and the Wash

Only 3 forms were received for Hunstanton on the coast of the Wash in 2018. Sadly, available dates and suitable weather failed to line up with the EIFCA for dives from their boats. We hope to dive with them during 2019, though their focus is more ground truthing in the Cromer Shoals MCZ.

One exciting species record was a Curled octopus (*Eledone cirrhosa*) discovered alive on the beach at low tide and returned to the sea.

Norfolk

This section covers all the records taken between Cley in the NW and Overstrand in the SE, and several wreck and seabed sites accessed from Sea Palling. Most dives were within or adjacent to the new Cromer Shoals MCZ.

Cley

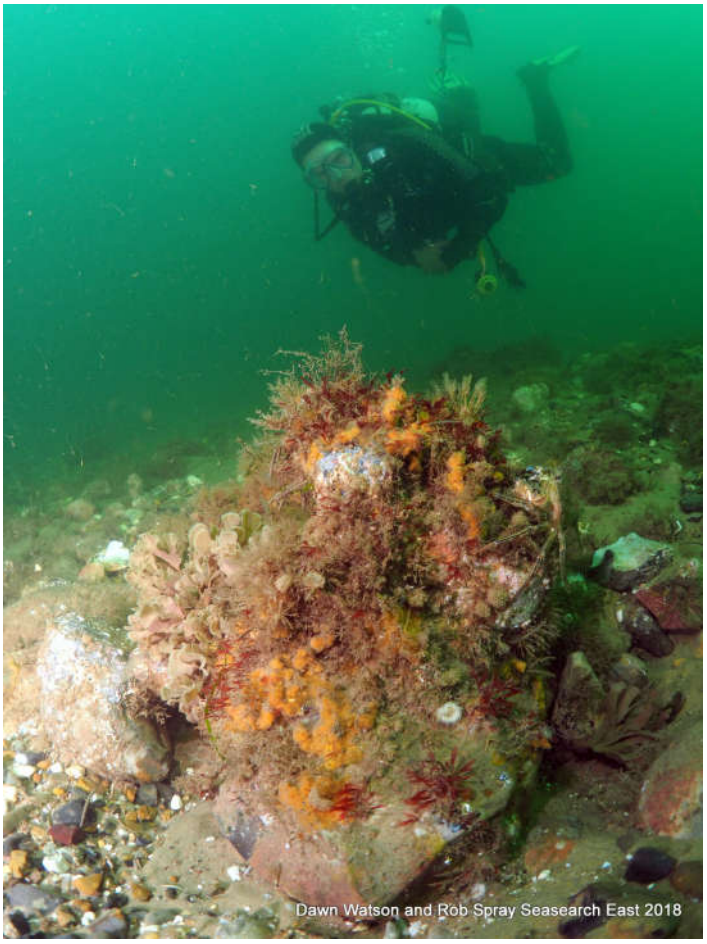
Cley was very popular with divers during 2018, with 42 forms received for the Vera wreck and the fossilised forest another 350m out, a 133% increase on the previous year! Further exploration was made of the Seabed to the East of the wreck, where the scour is populated by large chalk boulders and outcrops with further parts of the ship.

In common with several other Norfolk sites, many live *Pectinaria belgica* – a tubeworm were seen on the sand, having only been seen as empty tubes in previous years.

The beautiful delicate tube of *Pectinaria belgica*, from Cley

Salthouse

Seven Survey forms were received for Salthouse, mainly concentrating on the extensive reef of carr stone boulders approximately 250m NE of the entry point, which eventually transitions to heavily undercut chalk outcrops further East. This area contains very dense and varied animal life, especially squirts, sponges and bryozoans, with many unusual crustaceans hiding in the holes and overhangs. A small adult *Raja clavata* (thornback ray) was seen in the sand.



Typical diverse soft rock community at Salthouse of sponges, anemones, bryozoans and hydroids.

Adult *Raja clavata* at Salthouse

Weybourne

For the first time, Weybourne dropped in popularity and only 27 Seasearch forms were received, compared to 42 in the previous year. This is mainly due to the huge sand waves carried in by the storm event of early March, which covered much of the boulder scour around the wreck of the Rosalie and inner chalk gullies under the cliffs, while exposing more of the lower wreckage which now looks quite unstable.

One evening drift from the wreck to the cliffs was done in the company of many *Alloteuthis subulata* squid attracted to the divers' torches – these are generally very shy and only their egg masses are recorded.

Once again, a lot of fishing related litter was present, with cooked crab waste and angling tackle making up the bulk of sightings. The angling tackle was removed where possible.

Spalla Gap

8 forms were received from a day of dive surveys at Spalla Gap, a rarely accessible site on private land between Weybourne and Sheringham. The influx of fine sand over winter had filled a lot of the deeper gullies, but the chalk remaining still contained very diverse life, especially sponges and squirts, including *Perophora japonica.* This invasive squirt was common at this site and on most of the other Norfolk dives, having only been occasional in previous years. The native *Perophora listeri* was seen much less frequently than before.

Invasive seasquirt *Perophora japonica* with diagnostic yellow 'stars' growing up *Tubularia indivisa* stalks at Spalla Gap

Sheringham

Diving effort at Sheringham was on a par with the previous year with 29 forms received compared to 31. Much more interest was taken in the central area of town than previously, with algae rich chalk giving way to very silty flint boulder fields at depth.

Mating chains of *Aplysia punctata* were common in the shallows at the East end of town and the rarely seen algae *Naccaria wiggii* was also recorded here.

As expected, the populations of Corkwing wrasse (*Symphodus melops*) were at less than 50% of previous levels, but fish of all ages were seen and a single nest was observed close to the abandoned sewer pipe now used as a snorkel trail.

Sea hare, *Aplysia punctata* at Sheringham

West Runton

8 forms were received for West Runton, a site which escaped most of the sand influx, but which was very prone to disturbed visibility. Efforts were made to survey the chalk to the NW of the entry point, which involved a lot of extra swimming, but was well worth it for the more rugged seabed and an interesting range of algae not seen at other sites. The seldom seen sponge *Dysidia pallescens* was recorded, but the most exciting find was *Micrenophrys Lilljeborgii* (Norway bullhead) – see page 2 for details and a photo.

***Naccaria wiggii*, a rare algae only recorded 3 times on the East coast of the UK, all in North Norfolk by Seasearchers**

East Runton

East Runton also escaped the worst of the fine sand waves and 11 forms were received. The stalked jelly *Calvadosia campanulata* was found here and in other Norfolk sites quite frequently where there was sufficient algae and various spp of Nut crabs were also quite common on coarse sediment at depth. European eels and Red mullet put in an occasional appearance, but the mullet did not pause to have their photo taken.

Two nut crabs, *Ebalia tumefacta* fighting over territory

European eel, *Anguilla anguilla*, pausing before setting out for the Sargasso sea to breed

Cromer

Cooked crab waste on seabed off Cromer

7 forms were handed in for Cromer – the lack of nearby parking and many steep steps still makes this site very hard to sell to divers. Aside from abundant sponges, one notable feature was the large number of lobster pot strings with piles of cooked crab waste surrounding them – it is illegal to get rid of waste at sea, but this is a very common sight. When well

spread out, the waste is not directly detrimental to sealife, but it has been seen dumped inside knotted black bin bags, which obviously kills everything on the seabed.

Overstrand

Typical Overstrand seabed with sandmasons and squirt dominated turf

***Pagurus cuanensis*, the Hairy hermit crab**

Unusually, most of the dives at Overstrand were done in the early part of the Summer with 13 Survey forms handed in between July and September.

Female *Ebalia tumefacta* (Nut crab), compare with very different males on previous page

Very large sand movements meant that the large chalk outcrops from 2017 were almost completely buried and a further area of sand waves at depth meant that the seabed sloped to 12.5m deep approximately 350m offshore, then rose again to 10m deep!

Species highlights included a first sighting of the hairy hermit crab (*Pagurus cuanensis*) and a large shoal of transparent gobies (*Aphia minuta*), the latter being spotted quite often at various Norfolk sites, but almost impossible to photograph or count as they are very well disguised!

***Aphia minuta*, the Transparent goby in a rare photogenic mood**

There were still huge beds of the tube dwelling Amphipod *Ampelisca sp* which is now also starting to appear as small patches at other Norfolk sites. The main habitat was glacial clay with vast sandmason beds and flint boulders, cobbles and pebbles with a squirt and sponge crust.

Further Southeast – wreck dives

Offshore visibility and sea conditions were not ideal during 2018, so only 8 Seasearch forms from between Happisburgh and Gorleston were received from wrecks and intertidal sites.

Two of the wrecks accessed from Sea Palling provided interesting species records; the Nubia contained a Tompot blenny (*Parablennius gattorugine*) and the

algae *Delessaria sanguinea* (Sea beech), both very rarely seen elsewhere on the East Anglian coast, and the sand seabed around the Alice Taylor had a low growing reef of *Sabellaria spinulosa*, a very important reef building tube worm habitat.

Typical wreck scene accessed from Sea Palling with Plumose anemones, Shredded carrot sponge and amphipod tubes

Tompot blenny – *Parablennius gattorugine*

Suffolk

After 2016 being a very good year for Suffolk, with a brief period in September when visibility at the shore got up to a mighty 1-2m, visibility once again returned to the usual 'drinking chocolate' in 2017 and 2018.

Aldeburgh

One intertidal form was received from Aldeburgh beach, reporting on the aftermath of the 'Beast from the East'. Most of the washed up animals were dead, but the living ones returned to the sea included Lesser weever fish, Common lobsters, Common sunstars and a single Sea mouse (*Aphrodita aculeata*).

Orfordness

8 forms were received from 5 sites around Orfordness in March, April and June.

Unfortunately, the storm damage here was very great, with enormous amounts of shingle and concentrated plastic litter pushed inland from the sea, inundating and partially filling the coastal lagoons. No starlet anemones were seen this year. Sites on the sheltered side of the Ness returned records very similar to previous years, though much less algae was seen.

Nick Schiller draws the short straw and collects the colonisation array in April. Previously the float had been sunk by an overgrowth of algae.

Levington Marina

2 Survey forms were received for April and August from pontoon surveys during seaweed collection. The biggest difference was the die back of seaweed species – *Undaria pinnatifida* is known to be an early Spring species, but *Desmarestia viridis* also went from common in April to not found in August and all other algae species except wracks appeared sparse and stunted.

Very large Grey mullet (*Chelon labrosus*) were observed jumping completely clear of the water in August – no insects were seen, so this could have

been a sign of distress – there was a fuel slick on the water and a strong smell of sewage.

Rope overgrown with squirts and red algae at Levington

One of several large Seabass (*Dicentrarchus labrax*) sheltering under the pontoons at Levington in April

Essex

Misjudging the tide rather at Walton

A day of intertidal surveying resulted in 3 forms for Point Clear, Walton on the Naze and Jaywick in September. The invasive bivalve *Ruditapes philippinarum* was occasional on the shore at Point Clear, along with the rather lovely brittlestar *Amphipholis squamata* and surprisingly frequent white Pycnogonids.

***Ruditapes philippinarum* at Point Clear**

***Amphipholis squamata* brittlestar at Point Clear**

Other activities

Courses

We ran several courses of our own this year and helped out on one run by another Seasearch tutor.

Seaweed ID for NWT

We ran an introduction to seaweed ID and pressing at the Norfolk Wildlife Trust centre at Cley in the spring, which included a low tide collection at Sheringham.

Unfortunately, it took place not long after the 'Beast from the East' and participants struggled to find many species that had survived! Luckily, we brought along plenty of samples from more sheltered locations.

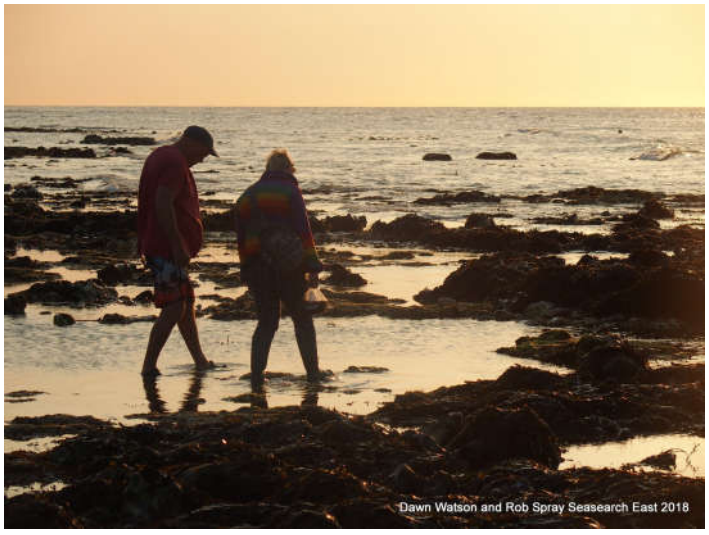
Bingham Observer

A BSAC club based near Nottingham was keen to undertake a survey project in Loch Sunart, but few members had much ID or surveying experience, so we gave them the theory part of the Observer course using a selection of species they'd be likely to come across and they went on to do the qualifying dives on site with Natalie Hirst and Owen Paisley of Seasearch Scotland. This seemed to work well, as each tutor reinforced the important learning points and picked up on any bad habits over several weeks.

Matching species photos into phylum categories with Bingham BSAC

Sheringham Observer

Our usual July Observer course at Sheringham in Norfolk was well attended by new divers, several refreshers and a few non-divers who wanted to use the knowledge for snorkel and intertidal surveys. The practical session was split into divers and rockpoolers, with the rockpoolers finding the year's first sea hare!



'Do you think we can give up yet? I can't see any more...'

Arran Observer

In April we joined Owen Paisley on Arran to help out with an Observer course and fit a few dives in – again, people were keen to use Seasearch skills on intertidal and snorkeling events, so extra tutors were very handy for marshalling the various interest groups.

Owen holds forth at the excellent Octopus centre on Arran

EIFCA course

The local Inshore fisheries and conservation authority asked us to do a marine ID course for them with emphasis on what could and couldn't be identified reliably from remotely operated video equipment. This was a great opportunity for us to see the limitations of what they had to work with as well as the advantages of being able to view any part of the seabed without having to wait for good diving conditions.

Norwich science fair seaweed course

In tandem with the local biological records office, we ran a seaweed ID and pressing course for older children with Asperger's syndrome. This was not entirely altruistic; people with this mindset often make very good surveyors and recorders for all kinds of biological groups, so the local records officer also did a presentation about other recording schemes they could consider.

It was a surprisingly enjoyable afternoon and we gained at least a couple of new volunteers from the attendees and support staff, so well worth doing!

Beast from the East

I have mentioned the storm event referred to as 'the Beast from the East' a few times, so it seems I should include a few photos. An extreme drop in temperature and heavy snowfall, resulting in a layer of very cold almost fresh water paralysing animals living in the shallows just off the East coast, shortly before a very big storm surge threw most of the

inshore seabed up onto the beach. Most of the victims were already dead by the time that the storm was over, only crustaceans seemed to survive in significant numbers.

Corkwing wrasse (*Symphodus melops*) and mostly Hornwrack (*Flustra foliacea*)

These pictures are from Sheringham in Norfolk, but similar scenes were found all along the East coast.

5 bearded rockling (Ciliata mustela) – many more than we ever see alive

Fish, crustaceans, anemones and bryozoans were all thrown high up the beach and into the streets of towns. The victims shown here are mostly species which live on the chalk reef, but Suffolk beaches mostly had sand living species, such as weever fish and sunstars.

The final photo shows a long spined sea scorpion next to its egg mass, two generations wiped out together. The eggs were returned to the sea, but were unlikely to survive.

It was however, amazing to see how quickly populations bounced back over the summer and autumn, with opportunistic squirt species overwhelmed by the usual mix of species and sandmason stabilised sand waves broken down by growing crustaceans and starfish.

Long spined Sea scorpion *(Taurulus bubalis)* and eggs

Agents of change project

We continued to take part in meetings for the Agents of change project, run by the EIFCA and MCS, which genuinely did help disparate groups of sea users to find 'common ground'; though generally it was by finding shared enemies, it was a good bridge building experience for lots of the people involved.

Snorkel trail – escape to the country

We continued to spread the news about the Sheringham snorkel trail and diving opportunities on the East coast, often in fairly odd ways – Rob was filmed for the TV program 'Escape to the country' on a day when only the suicidal would have walked into the sea, so the team followed him round the shore at West Runton.

TV crew learn the hard way that suede shoes and rockpools don't mix

walkers are welcome reef talk

Rob also talked about the Norfolk reef to the national AGM of the 'Walkers are Welcome' group, which was held in Cromer. Several attendees from other 'chalky'

coasts were keen to have him do the same talk locally.

People in sensible hiking boots learn about the MCZ

Species records

The appendix below lists all the species recorded by Seasearch East volunteers during 2018, with a grand total of 356 for the whole of East Anglia - 30 more species than 2017, with the bulk being recorded in Norfolk .

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

Species lists

Scientific name	Common name	Lincs and Wash	Norfolk	Suffolk	Essex	East Anglia
Porifera	**Sponges**					
Halichondria panicea	Breadcrumb sponge		R-F	R		R-F
Halichondria bowerbankii	A sponge		O-F			O-F
Oscarella sp	A sponge		R-F			R-F
Sycon ciliatum	Vase sponge		R-F			R-F
Grantia compressa	Purse sponge		R-O			R-O
Haliclona oculata	Mermaid's glove		R-F			R-F
Haliclona viscosa	A sponge		O			O
Haliclona cinerea	A sponge		R-F			R-F
Halisarca dujardini	A sponge		R-F			R-F
Raspallia ramosa	Chocolate fingers sponge		R-O			R-O
Cliona celata	Boring sponge		R-F			R-F
Amphilectus fucorum	Shredded carrot		R-C			R-C
Porifera sp	Blue shredded carrot		O			O
Leucosolenia sp	Spikey lace sponge		R-F	R-F		R-F
Porifera ind.	Massive sponge sp		O-C	O		O-C
Porifera ind	Crust sponge sp		R-F			R-F
Myxilla incrustans	Yellow sponge crust		O			O
Dysidea fragilis	Goosebump sponge		R-C			R-C
Dysidia pallescens	Pink goosebump		R-O			R-O
Aplysilla sulfurea	A sponge		O			O
Clathrina coriacea	Lace sponge		O-C			O-C
Hymedesmia sp	Norfolk purple sponge		R-F			R-F
Polymastia penicillus	Chimney sponge		R-O			R-O
Suberites sp	A sponge		R			R
Suberites ficus	Sea orange		R-C			R-C
Suberites massa	A sponge		R-F			R-F
Stelligera rigida	A sponge		R-O			R-O
Cnidaria	**Hydroids and anemones**					
Alcyonium digitatum	Dead mens fingers		R-C			R-C
Actinia equina	Beadlet anemone		R-C			R-C

Scientific name	Common name	Lincs and Wash	Norfolk	Suffolk	Essex	East Anglia
Metridium dianthus	Plumose anemone		R-A			R-A
Sagartia elegans	Elegant anemone		R-C			R-C
Sagartia troglodytes	An anemone	C	R-C			R-C
Urticina felina	Dahlia anemone		R-C			R-C
Urticina eques	Horseman anemone		R			R
Diadumene cincta	Orange anemone			F		F
Tubularia indivisa	Oaten pipes		R-A	C-S		R-S
Ectopleura larynx	Oaten pipes		O			O
Hydractinia echinata	Hermit fur		R-F			R-F
Sertularia cupressina	White weed	O	O-F			O-F
Eudendrium sp	A hydroid		O-C			O-C
Abietinaria abietina	A hydroid		O			O
Halecium halecinum	A hydroid		R-F			R-F
Halecium beanii	A hydroid		R			R
Hartlaubella gelatinosa	A hydroid		R			R
Hydrallmania falcata	Helter skelter hydroid		R-C			R-C
Clytia hemisphaerica	A hydroid		F-C			F-C
Halopteris catharina	A hydroid		O-C			O-C
Plumularia setacea	A feathery hydroid		O-C			O-C
Obelia dichotoma	A hydroid		O-C			O-C
Amphisbetia operculata	A hydroid		R-O			R-O
Garveia nutans	A hydroid		F-C			F-C
Hydrozoa sp	A feathery hydroid	O				O
Kirchenpaueria pinnata	A feathery hydroid		O			O
Coryne eximia	A hydroid		R-F			R-F
Dynamena pumila	A hydroid		O			O
Nemertesia antennina	Antenna hydroid		R-O			R-O
Sertularella rugosa	A hydroid		R-C			R-C
Hydrozoa	Hydroid medusa		F			F
Tima bairdii	A hydroid		O			O
Aequorea sp	A hydroid		R			R
Aequorea vitrina	A hydroid		R			R
Auralia aurita	Moon jelly	R	R-O	O-A		R-A
Chrysaora hysoscella	Compass jelly	R	R-O			R-O
Cyanea capillata	Lion's mane jelly		R-O			R-O
Cyanea lamarckii	Blue jelly		R			R
Craterolophus convolvulus	A stalked jelly		R			R
Calvadosia campanulata	A stalked jelly		R-O			R-O
Annelida	**Segmented worms**					
Arenicola sp	Lugworm		O			O
Arenicola marina	Lugworm	O-C	R-C	F-S	O-F	R-S
Arenicola defodiens	Lugworm		O-C	C		O-C
Sabella pavonina	Peacock fanworm	R	R-C	R-C		R-C
Aphrodita aculeata	Sea mouse		O	R		R-O
Lanice conchilega	Sandmason worm	O-C	R-S		O-C	R-S
Cirratulis cirratulis	A worm		R			R
Harmothoe sp	A scaleworm		R			R
Hediste diversicolor	A ragworm		R			R

Scientific name	Common name	Lincs and Wash	Norfolk	Suffolk	Essex	East Anglia
Amblyosyllis formosa	A polychaete		R			R
Polydora ciliata	A tubeworm		R-S			R-S
Salmacina dysteri	Coral worm		R-F			R-F
Spirobranchus	Keel worms		R-C			R-C
Sabellaria spinulosa	Ross worm		O-C			O-C
Spirorbis	Spiral worm		R-O			R-O
Amphitrides gracilis	A tubeworm		R			R
Terebellid sp	A tubeworm		R-O			R-O
Pectenaria belgica	A tubeworm		R-F			R-F
Tubulanus annulatus	Football jersey worm		R			R
Oerstadia dorsalis	A worm		R			R
Procerodes littoralis	A flatworm			A		A
Crustacea	**Barnacles, crabs, shrimp and lobsters**					
Cirripedia	Barnacles	C	R-S	F-A	O-A	R-S
Cancer pagurus	Edible crab		R-C			R-C
Carcinus maenas	Shore crab	R-C	R-A		F	R-A
Necora puber	Velvet swimming crab		R-C			R-C
Pilumnus hirtellus	Hairy crab		R-O			R-O
Portumnus latipes	Pennant's swimming crab		R			R
Liocarcinus depurator	Harbour crab		R-O			R-O
Liocarcinus holsatus	Flying crab		R-O			R-O
Corystes cassivelaunus	Masked crab		R-O			R-O
Hyas araneus	Sea toad	R	R-O			R-O
Pisa armata	A spider crab		R			R
Inachus sp	A spider crab		R-C			R-C
Macropodia sp	Long legged spider crab		R-F			R-F
Pisidia longicornis	Long clawed porcelain crab		R			R
Ebalia tumefacta	Nut crab		R-O			R-O
Ebalia tuberosa	Nut crab		O			O
Pagurus bernhardus	Common hermit crab		R-C			R-C
Pagurus cuanensis	Hairy hermit crab		R			R
Paguridae	Hermit crab		R-C			R-C
Galathea intermedia	A squat lobster		R-O			R-O
Galathea squamifera	Brown squat lobster		O-C			O-C
Homarus gammarus	Common lobster		R-C	O		R-C
Palaemon serratus	Common prawn		R-C	R		R-C
Palaemon sp	A prawn			O		O
Crangon crangon	Brown shrimp		R-C			R-C
Pandalus montagui	Northern prawn		R-C			R-C
Eualus sp	A shrimp		R			R
Hippolytes varians	Chameleon prawn		R-F			R-F
Caprella sp	Skeleton shrimp			O-C		O-C
Mysida sp	Mysid shrimps		R-F	O		R-F
Gammarid	A shrimp			O-F		O-F
Amphipoda sp	An amphipod		R-F			R-F
Ampelisca sp	An amphipod		R-A			R-A
Jassa sp	An amphipod	R	F-S	C		R-S
Corophium volutator	An amphipod			O		O

Scientific name	Common name	Lincs and Wash	Norfolk	Suffolk	Essex	East Anglia
Lekanesphaera rugicauda	An isopod			O		O
Copepoda sp	Parasite on nudibranch		R			R
Idotea sp	An isopod		R	C		R-C
Idotea linearis	An isopod		R-O	R-C		R-C
Idotea neglecta	An isopod			R-O		R-O
Idotea chelipes	An isopod			O		O
Mollusca	**Molluscs**					
Polyplacophora	Chiton		R-O			R-O
Lepidochitona cinerea	A chiton				O	O
Aplysia punctata	Sea hare (eggs)		R-C			R-C
Nudibranchia sp	Nudibranch eggs		O-F	F		O-F
Doto sp	A nudibranch		R-O			R-O
Dendronotus frondosus	Xmas tree sea slug		R			R
Flabellina lineata	A nudibranch		R			R
Fjordia brownii	A nudibranch		R			R
Edmundsella pedata	Violet sea slug		R-O			R-O
Polycera quadrilineata	A nudibranch		R			R
Polycera faeroensis	A nudibranch		R			R
Janolus cristatus	Crystal slug		R-F			R-F
Acanthodoris pilosa	A nudibranch		R-F			R-F
Onchidoris bilamellata	A nudibranch		R-A			R-A
Eubranchus exiguus	A nudibranch		O			O
Doris pseudoargus	Sea lemon		R			R
Facelina bostoniensis	A nudibranch		R-O			R-O
Facelina auriculata	A nudibranch		R			R
Goniodoris nodosa	A nudibranch		R-F			R-F
Palio nothus	A nudibranch		R			R
Catriona aurantia	A nudibranch		R-O			R-O
Aeolidia sp	A nudibranch		R			R
Aeolidia filomenae	A nudibranch		R			R
Crepidula fornicata	Slipper limpet		R-O			R-O
Steromphala cineraria	Grey topshell		R-F			R-F
Calliostoma zizyphinum	Painted topshell		R-F			R-F
Buccinum undatum	Common whelk		R-A			R-A
Littorina saxatilis	Rough periwinkle	O	C	R	O-F	R-C
Rissoa sp	A gastropod			O		O
Rissoa parva	a gastropod		O-A			O-A
Hydrobia acuta neglecta	A mud snail			F		F
Nucella lapillus	Dog whelk		R-F			R-F
Ocenebra erinacea	Sting winkle		R			R
Patella vulgata	Common limpet		R-O		O	R-O
Tectura virginea	White tortoiseshell limpet		R-O			R-O
Limecola balthica	A tellin		S			S
Mytilus edulis	Edible mussel	C	R-O	F-C	R	R-C
Cerastoderma edule	Edible cockle	R			O	R-O
Cerastoderma glaucum	Lagoon cockle			O-F		O-F
Magellana gigas	Pacific oyster			F	O-C	O-C
Ruditapes philippinarum	A clam				O	O

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Barnea candida	White piddock		O-C			O-C
Ensis magnus	Razor shell		O-S			O-S
Sepiola atlantica	Little cuttlefish		R-O			R-O
Alloteuthis subulata	Small squid eggs		R-O			R-O
Eledone cirrhosa	Curled octopus	R				R
Bryozoa	**Sea mats and sea mosses**					
Bryozoa	Encrusting bryozoan indet		R-F			R-F
Conopeum reticulatum	Encrusting bryozoan		F-C	O		O-C
Conopeum seurati	Encrusting bryozoan			C-A		C-A
Electra pilosa	Frosty sea mat		O-C	O		O-C
Schizomavella linearis	Encrusting bryozoan		O-F			O-F
Bowerbankia citrina	A bryozoan		R-F			R-F
Bowerbankia imbricata	A bryozoan		R-F			R-F
Bicellariella ciliata	A bryozoan		O-F			O-F
Flustra foliacea	Hornwrack		R-C			R-C
Flustridrella hispida	A bryozoan		F			F
Alcyonidium diaphanum	Finger bryozoan	O	R-C			R-C
Alcyonidium hirsutum	A bryozoan		R			R
Anguinella palmata	A bryozoan		C		O	O-C
Scrupocellaria sp	A bryozoan		R-F			R-F
Scrupocellaria scruposa	A bryozoan		O-C			O-C
Vesicularis spinulosa	A bryozoan		R-O			R-O
Eucratia loricata	A bryozoan		R			R
Bugula sp	Bottlebrush bryozoan		O			O
Crisularia plumosa	Bottlebrush bryozoan		O-A			O-A
Bugulina flabellata	Bottlebrush bryozoan		O			O
Bugulina turbinata	Bottlebrush bryozoan		R			R
Caberea boryi	A bryozoan		R			R
Crisia eburnae	A bryozoan		F			F
Crisia sp	A bryozoan		R-F			R-F
Nolella stipata	A bryozoan		O-F			O-F
Cellepora hyalina	A bryozoan		O			O
Disporella hispida	A disc bryozoan		R-O			R-O
Plagioecina patina	A disc bryozoan		O-F			O-F
Echinodermata	**Starfish, urchins and brittlestars**					
Ophiura albida	Sand brittlestar	O	O			O
Ophiura ophiura	Sand brittlestar		O			O
Amphipholis squamata	A brittlestar				O	O
Asterias rubens	Common starfish		R-A			R-A
Henricia sp	Bloody henry		R-F			R-F
Crossaster papossus	Common sunstar		R-C	F		R-C
Echinus esculentus	Edible urchin		R			R
Thyone sp	A gravel cucumber		R			R
Tunicata	**Sea squirts**					
Ascidiacea	A tunicate		R		R	R
Perophora listeri	a tunicate		R-C			R-C
Perophora japonica	An invasive tunicate		R-C			R-C
Ascidiella aspersa	A tunicate		R-O	O-F		R-F

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Ascidiella scabra	A tunicate			O		O
Molgula complanata	A tunicate		R-F			R-F
Molgula sp	A tunicate	R	O-A			R-A
Styela clava	Leathery squirt			O		O
Ciona intestinalis	Yellow ringed squirt			F		F
Dendrodoa grossularia	Baked bean squirt		R-O			R-O
Diplosoma spongiforme	Sponge squirt		O-A			O-A
Diplosoma listerianum	A tunicate		O			O
Botrylloides leachii	A tunicate		O-F			O-F
Botrylloides diegensis	A tunicate			C		C
Botrylloides sp	A tunicate		O	R-F		R-F
Botryllus schlosseri	Star squirt		R-O	O-F		R-F
Didemnum maculosum	Snowflake squirt		R-C			R-C
Tridemnum cereum	A tunicate		R-C			R-C
Lissoclinum perforatum	A tunicate		O			O
Polyclinum aurantium	A tunicate		R-F			R-F
Clavelina lepadiformis	Lightbulb sea squirt		R-C	F		R-C
Corella eumyota	An invasive tunicate		R			R
Archidostoma aggregatum	A tunicate		R-C			R-C
Polysyncraton bilobatum	A tunicate		R-F			R-F
Morchellium argus	A club squirt		R-C			R-C
Aplidium turbinatum	A tunicate		R-C			R-C
Aplidium glabrum	A tunicate		R-F			R-F
Aplidium fulgens	A tunicate		R			R
Distaplia rosea	A tunicate		R-O	R		R-O
Pisces	**Fishes**					
Raja clavata	Thornback ray		R			R
Scyliorhinus canicula	Lesser spotted catshark		R			R
Anguilla anguilla	European eel		R			R
Syngnathus sp	Pipefish sp		R-O			R-O
Syngnathus acus	Greater pipefish		R-O			R-O
Syngnathus rostellatus	Lesser pipefish	R	R-O			R-O
Entelurus aequoreus	Snake pipefish		R			R
Callionymus sp	A dragonet		O			O
Callionymus reticulatus	Reticulated dragonet		R-O			R-O
Callionymus lyra	Common dragonet		R-O			R-O
Pomatoschistus sp	Sand goby	C	R-A			R-A
Pomatoschistus minutus	Sand goby		O-F			O-F
Pomatoschistus pictus	Painted goby		R-F			R-F
Gobiusculus flavescens	Two spot goby		O-F			O-F
Lipophrys pholis	Shanny		R			R
Parablennius gattorugine	Tompot blenny		R			R
Aphia minuta	Transparent goby		R-O			R-O
Agonus cataphractus	Pogge		R			R
Echiicthys vipera	Lesser weever		R-O	F		R-F
Taurulus bubalis	Long spined sea scorpion		R-F			R-F
Myoxocephalus scorpius	Short spined sea scorpion		R			R
Micrenophrys lilljeborgii	Norway bullhead		R			R

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Ciliata mustela	5 bearded rockling		O			O
Pollachius pollachius	Pollack		R			R
Dicentrarchus labrax	Sea bass		R-C	R-O		R-C
Trisopterus luscus	Bib		R-C			R-C
Gadus morhua	Cod		R			R
Chelon labrosus	Grey mullet			F		F
Mullus surmuletus	Striped red mullet		R			R
Gasterosteus aculeatus	3 spined stickleback			R-O		R-O
Pholus gunnellus	Butterfish		R-O			R-O
Symphodus melops	Corkwing wrasse		R-C			R-C
Labrus bergylta	Ballan wrasse		R-C			R-C
Ctenolabrus rupestris	Goldsinny		R			R
Liparis sp	Sea snail		R			R
Liparis montagui	Montague's sea snail		R			R
Ammodytes sp	Sand eel		R-F			R-F
Eutriglia gurnardus	Grey gurnard		R			R
Platichthys flesus	Flounder	R	R			R
Pleuronectes platessa	Plaice		R			R
Limanda limanda	Dab		R-O			R-O
Solea solea	Dover sole		R			R
Scophthalmus rhombus	Brill		R			R
Algae	**Seaweeds**					
Algae	Mixed algae		R-O			R-O
Ulva sp	Sea lettuce	R-C	O-C	F	F-C	R-C
Ulva lactuca	Sea lettuce		R-F	O-F	O-F	R-F
Ulva linza	Gut weed		O-C	R-F	O-C	R-C
Chaetomorpha sp	A green algae		R-F	F-A		R-A
Chaetomorpha linum	Brick weed		O			O
Chlorophyta	'green fluff'		F			F
Derbesia sp	A green algae		R			R
Cladophora sp	A green algae		R			R
Cladophora rupestris	Rope weed		O-C			O-C
Bryopsis plumosa	Mossy feather weed		O-F	F		O-F
Rhizoclonium riparium	Rooting green thread weed			O		O
Diatoms	Diatoms		O-A			O-A
Phaeocystis	Single celled algae		F-C			F-C
Undaria pinnatifida	Wakame			C		C
Scytosiphon lomentaria	Chipolata weed			O		O
Dictyota dichotoma	Brown fanweed		O-C			O-C
Taonia atomaria	Dotted peacock weed		O-C			O-C
Cutleria multifida	Cutler's many cleft weed		O-F			O-F
Petalonia fascia	Broad leaf weed		O			O
Cladostephus spongiosus	Hairy sand weed		O-F			O-F
Fucus sp	A wrack			F		F
Fucus vesiculosus	Bladderwrack		O-C	C	O-C	O-C
Fucus serratus	Serrated wrack		R-F	F		R-F
Fucus spiralis	Spiral wrack	C	R-C			R-C
Ascophyllum nodosum	Egg wrack			O-C		O-C

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Halidrys siliquosa	Podweed		R-O			R-O
Desmarestia viridis	Desmarest's green weed		R	C		R-C
Rhodophyta	Red algae	O	R-A	C		R-A
Rhodophyta ind crust	Red encrusting algae		R-F			R-F
rhodophyta	'red fluff'		O-F			O-F
Corallinaceae crusts	Pink encrusting algae		R-C			R-C
Corallina officianalis	Common coral weed		O-C			O-C
Gracilaria gracilis	Slender wartweed		R-C	O		R-C
Chondria dasyphylla	Diamond cartilage weed		O-C			O-C
Halurus flosculosus	Mrs Griffith's little flower		O			O
Halurus equisetifolius	Sea Horsetail		O-C			O-C
Naccaria wiggii	A red algae		R			R
Chondrus crispus	Irish moss		R-F	O		R-F
Ceramium echionitum	A pincer weed		R-F	O-F		R-F
Ceramium sp	A pincer weed		R-O	O-F		R-F
Polysiphonia elongata	Elongate siphon weed		F			F
Polysiphonia nigra	Twisted siphon weed		R	C		R-C
Polysiphonia sp	A Siphon weed		F			F
Delessaria sanguinea	Sea beech		R			R
Cryptopleura ramosa	Fine-veined crinkle weed		O-F			O-F
Grateloupia filicina	Grateloup's fern weed		R-F			R-F
Plocamium sp	Comb weed		R-C			R-C
Plumaria plumosa	Soft feather weed			O-F		O-F
Phyllophora pseudoceranoides	Stalked leaf bearer		O	C		O-C
Cystoclonium purpureum	Purple claw weed		F	C		F-C
Hypoglossum hypoglossoides	Under tongue weed		R-O			R-O
Scinaia furcellata	Scina's weed		O-F			O-F
Rhodymenia holmesii	Holme's rose weed		R-C			R-C
Rhodymenia ardissonei	Spikey rose weed		O-F			O-F
Heterosiphonia plumosa	Siphoned feather weed		R-F			R-F
Calliblepharis ciliata	Eyelash weed		R-C			R-C
Rhodothamnion floridula	Sandbinder		O-C			O-C
Vertebrata byssoides	Brongniart's thread weed		O-F			O-F
Osmundea sp	Fern weed		R-F			R-F
Gastroclonium reflexum	Reflexed grape weed		O-C			O-C
Porphyra sp	Lava		R-C		O-C	R-C
Halarachnion ligulatum	Sea spider weed		R-F			R-F
Polyides rotunda	Discoid fork weed		R-F			R-F
Furcellaria lumbricalis	Clawed forkweed		O			O
Ahnfeltia plicata	Black scour weed		R-C			R-C
Others	**Other phyla**					
Pedicellina sp	Entoprocts		F-C			F-C
Pycnogonidae	White sea spider		R		F	R-F
Pycnogonidae	Red sea spider		R			R
Halyphysema tumanowiczii	A foraminiferan		O-C			O-C
Pleurobrachia pileus	Sea gooseberry			R		R
Beroe sp	A comb jelly		R			R
Salicornia europaea	Samphire			F		F

Scientific name	Common name	Lincs and Wash	Norfolk	Suffolk	Essex	East Anglia
Total		**25**	**321**	**63**	**20**	**356**

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