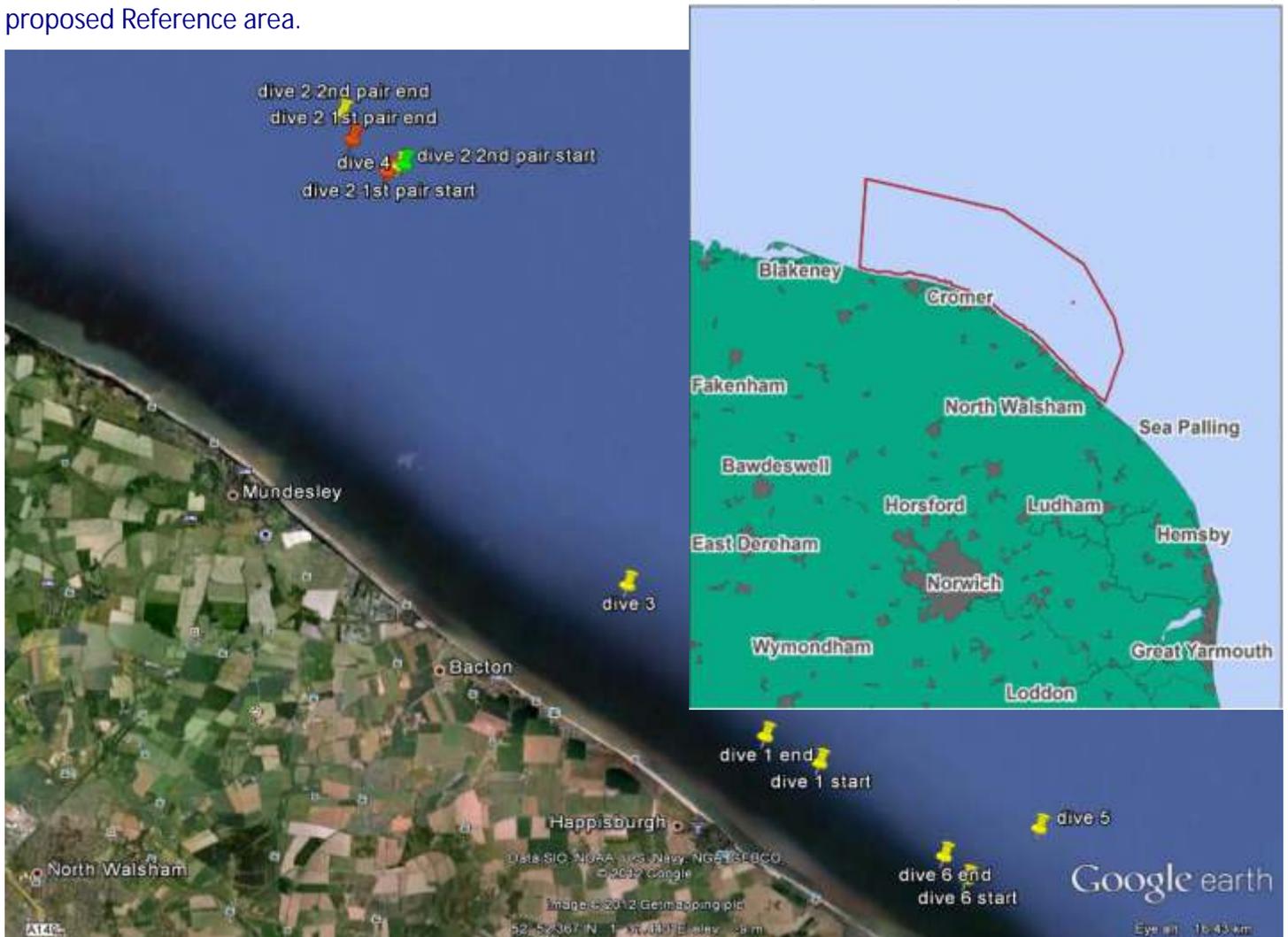


## North Norfolk Blue Mussel Bed recommended Reference Area

Seasearch Site Surveys 2012

This report summarises the results carried out in and around the Reference Area by Seasearch divers in August and September 2012. These dives were a subset of those carried out on the Cromer Shoal Chalk Beds rMCZ detailed in a separate report. The aim of the surveys was to highlight the habitats and species found within and around the area to support the designation process. Particular attention was paid to the Habitat and Species FOCl identified in the Ecological guidance on the designation of MCZs. Surveys were carried out within the proposed reference area, as well as within a mussel bed previously recorded by the EIFCA and a previously proposed Reference area.



Sites dived within and around proposed North Norfolk Blue Mussel Reference Area. Inset map shows position of Reference area within Cromer Shoal Chalk Beds rMCZ

### Physical Features of the Area

In its natural state, the seabed in this area is composed of mixed chalk and flint pebbles, cobbles and boulders over sand or clay. This provides a stable base for sessile animals, including *Sabellaria spinulosa*, *Molgula sp* squirts and *Mytilus edulis*, which further improve the stability. The seabed is gently undulating or almost flat.



## Features of the Marine Life

The sites dived were between 11 and 17m deep and generally covered by turbid water with visibility between 3 and 6m. Not much algae was observed, but there was a wide range of animal species.

Very few live blue mussels (*Mytilus edulis*) are present at any of the sites dived, but there are varying amounts of the reef building worm *Sabellaria spinulosa* which seems able to recover from some disturbance.

Larger boulders are covered with a mixture of Hornwrack (*Flustra foliacea*), *Molgula sp* sea squirts, encrusting sponges and feathery hydroids.

Cobbles and pebbles have a variety of tougher encrusting colonial sponges, squirts and bryozoans.

Small areas of sediment are dominated by Dahlia anemones (*Urticina felina*) and common whelks (*Buccinum undatum*).



Typical boulders with mixed sponges and bryozoans.

Numerous echinoderms, including common starfish (*Asterias rubens*), sunstars (*Crossaster papossus*), bloody henrys (*Henricia sp*) and several brittle star species patrol the area and the burrowing sea cucumber *Thyone sp* is occasional.



Tiny juvenile sunstar

Crustaceans are abundant; with large hermit crabs (*Pagurus bernhardus*) and edible crabs (*Cancer pagurus*) being most numerous, while common lobsters (*Homarus gammarus*) are absent, possibly due to the lack of suitable shelter. Squat lobsters (*Galathea squamifera*), Northern prawns (*Pandalus montagui*) and small spider crabs (*Inachus* and *Macropodia spp*) are also common and there are several nut crabs (*Ebalia tumefacta*) present.



Common prawn

Not many fish species are evident; common dragonets (*Callionymus lyra*) and sand gobies (*Pomatoschistus sp*) guard the small sand patches and one or two greater pipefish (*Syngnathus acus*) rest between the boulders.



healthy blue mussels and dahlia anemone photographed on a North Norfolk site prior to trawling



Common dragonet



A 'feeding frenzy' of common starfish



Greater pipefish

## Human uses and impacts

The main use for this area previously was potting for edible crabs, which is on a small scale and does not appear to cause any noticeable damage. Numbers of lost pots are relatively high around nearby wrecks, but this area does not contain many snagging opportunities. There is some recreational angling from boats, but no lost angling gear was noticed on any dive. Recreational diving is very rare in this area, as there are plenty of wrecks within easy reach which are more popular than flat seabed.

Currently, the main activity in the area appears to be trawling for mussels, possibly due to the closure of blue mussel bed fisheries in the wash. Almost all of the areas dived (including within the Reference Area) had some evidence of trawling, some were denuded of mussels, but still retained some areas of Sabellaria, others had lost all stabilising features and had become barren sand.

## Benefits of Protection

This Reference area was put forward by fishermen as it was considered to be of little economic interest, yet it has already been partially trawled. Many of the stabilising features still remain, so the bed could easily recover with a new spatfall. The renewed interest in trawling for blue mussels in the area can only lead to habitat degradation including the destruction of Sabellaria reefs and all sessile life, so this Reference Area could easily become an oasis in a desert.

# Technical Appendix

This appendix contains more detailed information about the surveys undertaken and records made. It includes:

- Dive details
- Habitat sketches
- Biotope list
- Species list

The data have been entered into Marine Recorder and are available as an MS Access 'snapshot' file on request from Seasearch. Data from surveys up to 2011 are publicly available on the NBN Gateway.

## Current Proposal

The recommended Reference Area is a very small area put forward by local fishermen as containing a blue mussel bed, but being of little commercial value.

## The features proposed for designation are:

Broad scale habitats A3.2 Moderate energy infralittoral rock

Habitat FOCI Blue mussel beds  
Subtidal chalk (modelled)  
Subtidal sands and gravels (modelled)

Species FOCI Blue mussel *Mytilus edulis*

## Features within the area but NOT proposed for designation are:

All features that are present within the rRA have been recommended for designation.

## Survey details

Dive 1: 4<sup>th</sup> August 2012 Seabed 1 mile from Happisburgh. Drift from small boat. Habitat, species and photographic records. Surveyors Jane Harris and Rick Southwood. From 52 49.900N 01 33.500E to 52 50.150N 01 32.800E. Survey form EA12/096 and Observer form EA12/030.

Dive 2: 7<sup>th</sup> August 2012 Blue Mussel Reference Area. Drift from club RIB. Two pairs of divers, approx 50m apart. Habitat, species and photographic records. Surveyors Dawn Watson and Rob Spray from 52 55.139N 01 28.191E to 52 55.430N 01 27.748E. Jon Chamberlain and Chris Wood from 52 55.185N 01 28.359E to 52 55.659N 01 27.633E. Survey forms EA12/039 and EA12/052.

Dive 3: 11<sup>th</sup> August 2012 Seabed 1 mile from Walcott. Slack water dive. Habitat, species and photographic records. Surveyors Jane Harris and Rick Southwood. 52 51.501N 01 31.083E. Survey form EA12/097 and Observer form EA12/063.

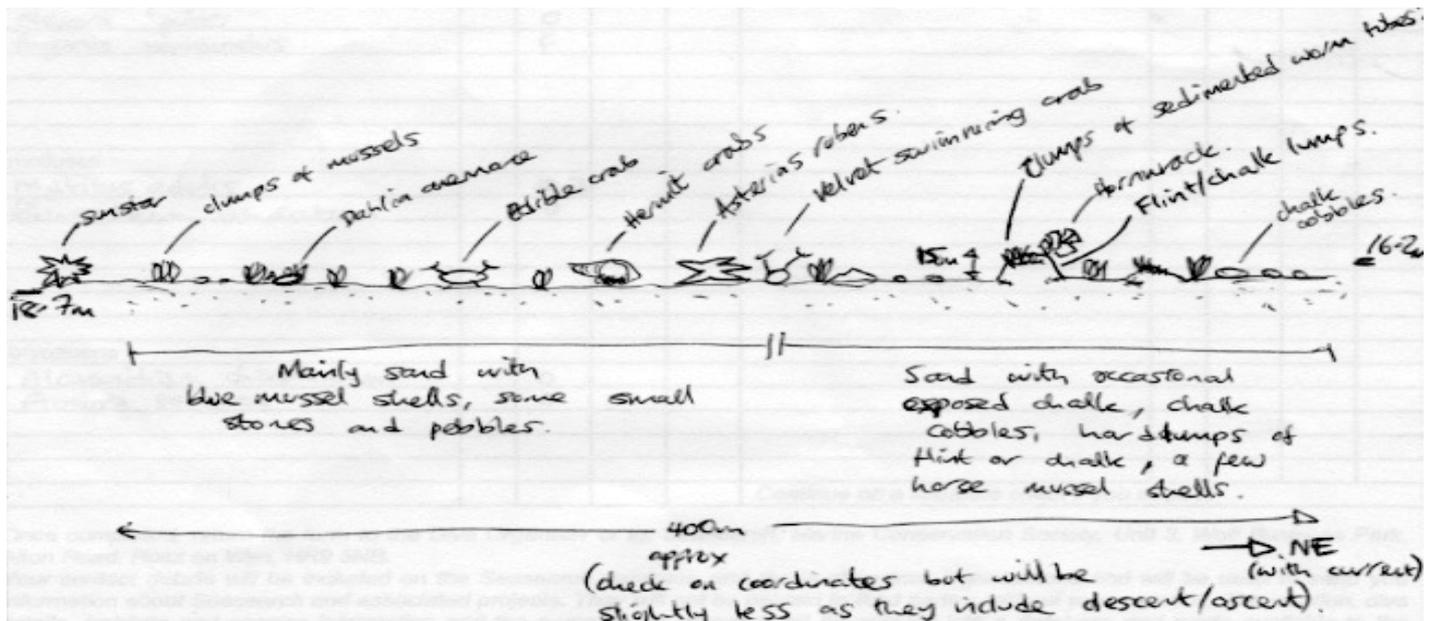
Dive 4: 24<sup>th</sup> August 2012 Blue Mussel Reference Area. Slack water dive. Habitat, species and photographic records. Surveyors: Jane Harris and Rick Southwood. 52 55.198N 01 28.426E. Survey form EA12/099 and Observer form EA12/064.

Dive 5: 1<sup>st</sup> September 2012. EIFCA recorded mussel bed. Slack water dive. Habitat, species and photographic records. Surveyors: Jane Harris and Rick Southwood.

52 49.252N 01 36.359E. Survey form EA12/100 and Observer form EA12/061.

Dive 6: Original proposed Blue Mussel Reference Area. Drift from small boat. Habitat, species and photographic records. Surveyors: Jane Harris and Rick Southwood. 52 48.843N 01 35.361E to 52 49.051N 01 35.078E. Surveyor form EA12/101 and Observer form EA12/062.

## Habitat sketch



## Sublittoral Biotopes recorded

Dive 1, 3 and 4	SS.SBR.PoR.SspiMx	Tube worms forming reefs on sublittoral sediment – Ross worm
Dive 2 (first pair)	SS.SMx.CMx.FluHyd	Hornwack and helter skelter hydroid on boulders, cobbles or pebbles with gravel and sand.
Dive 2 (second pair)	SS.SBR.SMus.MytSS	Blue mussel beds in shallow mixed sediment
Dive 5	SS.SCS.CCS	Tideswept coarse sand, gravel and pebbles in the circalittoral zone.
Dive 6	SS.SCS.ICS	Tideswept coarse sand, gravelly sand, pebbles and gravel in the infralittoral zone.

## Species List

Scientific name	Common name	Dive number	abundance	notes
Porifera				
Sponges				
<i>Halichondria panicea</i>	Breadcrumb sponge	1,3,5	O	
<i>Scypha ciliata</i>	Vase sponge	1,2,3	R-O	
<i>Polymastia penicillus</i>	Chimney sponge	1,2,3,4	R-O	
<i>Amphilectus fucorum</i>	Shredded carrot sponge	1,3,5	R-C	
<i>Dysidea fragilis</i>	Goosebump sponge	4	R	
Cnidaria				
Hydroids and anemones				
<i>Nemertesia antenina</i>	Antenna hydroid	1,3,4,5,6	R-O	

Scientific name	Common name	Dive number	abundance	notes
<i>Halecium halecinum</i>	Herringbone hydroid	1,3,4,5,6	R-O	
<i>Urtecina felina</i>	Dahlia anemone	1,2,3,4,5,6	R-C	
<i>Hydroid sp</i>	Feathery hydroids	1,3,4,5	O-C	
<i>Sagartia troglodytes</i>	Anemone	1,2,3,4,5,6	R-O	
<i>Sagartia elegans</i>	Elegant anemone	3	O	
<i>Sertularia cupressina</i>	White weed	2,3,4,6	R-O	
<i>Tubularia indivisa</i>	Oaten pipes	2,3,4,6	R-F	
<i>Plumularia setacea</i>	Feathery hydroid	3,5,6	R	
<i>Hydractinia echinata</i>	Hermit fur	3	R	
<i>Abietinaria abietina</i>	Hydroid	4	R	
<i>Sertularella rugosa</i>	Hydroid	4	R	
<i>Metridium senile</i>	Plumose anemone	5	R	
<i>Annelida</i>	Segmented worms			
<i>Sabellaria spinulosa</i>	Ross worm	1,2,3,4,5	O-A	
<i>Sabellaria spinulosa (dead)</i>	Ross worm (dead)	2	F	trawled
<i>Salmacina dysteri</i>	Coral worm	1,3	R	
<i>Pomatoceros sp</i>	Keelworm	1,2,4,5,6	R-C	
<i>Lanice conchilega</i>	Sand mason	1,2,3,4,5,6	O-C	
<i>Sabella pavonina</i>	Peacock fanworm	6	R	
<i>Crustacea</i>	Barnacles, crabs, shrimp and lobsters			
<i>Pagurus bernhadus</i>	Common hermit crab	1,2,3,4,5,6	O-A	
<i>Inachus sp</i>	Sponge spider crab	1,3,4,5,6	R-C	
<i>Pagurus spp</i>	Hermit crabs	2	C	
<i>Cirripedia sp</i>	Barnacle	1,3,4,5,6	O-A	
<i>Ebalia tumefacta</i>	Nut crab	1,3,5,6	R	
<i>Cancer pagurus</i>	Edible crab	2,3,4,5,6	R-C	
<i>Necora puber</i>	Velvet swimming crab	2,3,4,5	O-F	
<i>Caprella sp</i>	Skeleton shrimp	3,6	O-F	
<i>Galathea squamifera</i>	Squat lobster	3,5	O-C	
<i>Pandalus montagui</i>	Northern prawn	3,4	R-C	
<i>Liocarcinus deperator</i>	Harbour crab	4,5,6	O-F	
<i>Macropodia sp</i>	Long legged spider crab	5,6	O-F	
<i>Mollusca</i>	Molluscs			
<i>Buccinum undatum</i>	Common whelk	1,3,4,5,6	O-C	
<i>Eubbranchus tricolor</i>	Nudibranch	1,3,4	R-O	
<i>Gibbula cineraria</i>	Grey topshell	1,2,3,4,5	O-F	
<i>Janolus cristatus</i>	Crystal sea slug	1	O	
<i>Mytillus edulis</i>	Blue mussel	2	O	Many dead
<i>Mytilus Edulis (juvenile)</i>	Blue mussel (juvenile)	1,4	R	
<i>Crepidula fornicata</i>	Slipper limpet	2,3,4,5,6	O-C	
<i>Calliostoma zizyphinum</i>	Painted topshell	2,3,4,5	R-O	
<i>Hydrobia sp</i>	Gastropod	3	C	
<i>Doto coronata</i>	Nudibranch	4	O	
<i>Doto sp I</i>	Nudibranch	3	F	On Nemertesia
<i>Doto sp II</i>	Nudibranch	3	O	On Halecium
<i>Onchidoris bilamellata</i>	Nudibranch	3	O	
<i>Coryphella browni</i>	Nudibranch	5	R	
<i>Trivia arctica</i>	Cowrie	5	R	
<i>Bryozoa</i>	Sea mats and sea mosses			
<i>Crisia sp</i>	Bryozoan	1,3,5,6	R-O	

Scientific name	Common name	Dive number	abundance	notes
<i>Flustra foliacea</i>	Hornwrack	1,2,3,4,5,6	R-C	
<i>Alcyonidium diaphanum</i>	Finger bryozoan	1,2,3,4,5,6	R-C	
<i>Electra pilosa</i>	Frosty sea mat	1,2,4,5,6	R-F	
<i>Bicellariella ciliata</i>	Bryozoan	2	O	
<i>Bugula plumosa</i>	Spiral bryozoan	3,4	R-O	
Echinoderms	Starfish, urchins and brittlestars			
<i>Ophiothrix fragilis</i>	Common brittlestar	1,3,5,6	O-F	
<i>Asterias rubens</i>	Common starfish	1,2,3,4,5,6	R-F	
<i>Crossaster papposus</i>	Common sunstar	1,2,3,4,5,6	R-F	
<i>Henricia sp</i>	Bloody henry	1,2,3,4,5	R-F	
<i>Thyone sp</i>	Burrowing sea cucumber	3	R	
<i>Ophiura albida</i>	Sand brittlestar	3,5,6	O-C	
Tunicata	Sea squirts			
<i>Ascidia mentula</i>	Sea squirt	1,3	R-O	
<i>Molgula sp</i>	Sea squirt	1,2,3	O-C	
<i>Botryllus schlosseri</i>	Communal sea squirt	1,3	O	
<i>Diplosoma spongiforme</i>	Sponge sea squirt	1	O	
<i>Dendrodoa grossularia</i>	Baked bean squirt	2	O	
<i>Distaplia rosea</i>	Communal sea squirt	3	R	
<i>Didemnum maculosum</i>	Communal sea squirt	3,4	R-O	
Pisces	Fishes			
<i>Callionymus lyra</i>	Common dragonet	1,3,4,5,6	R-C	
<i>Pomatoschistus sp</i>	Sand goby	1,3,4,5,6	O-C	
<i>Pomatoschistus pictus</i>	Painted goby	3,6	R-O	
<i>Trisopterus luscus</i>	Bib	3	R	
<i>Taurulus bubalis</i>	Long spined sea scorpion	3,4	R-O	
<i>Phollis gunnellus</i>	Butterfish	4,5	R-O	
<i>Syngnathus acus</i>	Greater pipefish	5,6	R-O	
Algae	Seaweeds			
<i>Rhodophycota</i>	Mixed red algae	1,2,3,4,5,6	R-F	
<i>Plocamium cartilaginum</i>	Comb weed	1,3,5	R-O	

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## Acknowledgements

This report has been written by Dawn Watson based on Seasearch Survey records made by Dawn Watson, Jon Chamberlain and Jane Harris, Observation records made by Rick Southwood. All photographs in this report were taken by Rob Spray, Jane Harris and Dawn Watson within the Cromer Shoal Chalk Beds dMCZ.

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