

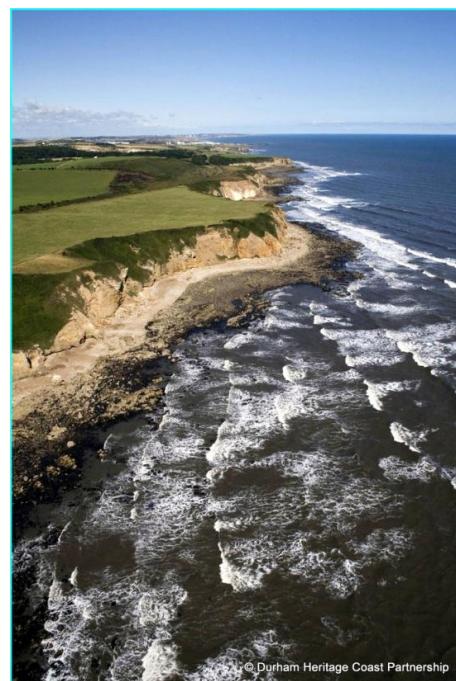
The Durham Heritage Coast

Seasearch Site Surveys 1991-2016

This report summarises the results of surveys along the Durham Heritage Coast carried out by Seasearch divers in the seven year period from 2009 to 2016, following on from the original Durham Coast survey in 1991¹ under the auspices of the Marine Nature Conservation Review (MNCR). The aim of the surveys was to add detailed records of the habitats and species found within this relatively un-dived and un-surveyed area. Particular attention was paid to priority species and habitats (as identified on various designation lists)² and to the Habitat and Species FOCI identified in the Ecological Guidance on the designation of Marine Conservation Zones (MCZs)³ (which were reviewed in May 2016).

Background

The Durham Heritage Coast runs for approximately 18km in three sections from Sunderland in the north to Hartlepool in the south. It is managed by the Durham Heritage Coast Partnership⁴, consisting of various organisations (local authorities, statutory agencies, land owners and community bodies), which was formed in 2003 to build upon the achievements of the Turning The Tide project⁵. A once-heavily industrialised landscape (the last pit, Easington, closed in 1993), over a million tonnes of colliery spoil and associated debris has been successfully removed to re-generate the coastline for wildlife. The images depict Easington Colliery before (1992; below) and after (2010, the year in which the area won the UK Landscape Award⁶, right).



Parts of the foreshore are designated as Special Protection Areas (SPAs) under the Birds Directive (Directive 79/409/EEC April 1979; Directive 2009/147/EC as amended 2009) – the Northumbria Coast SPA between Sunderland and Seaham, and the Teesmouth and Cleveland Coast SPA from Blackhall Colliery to Hartlepool. These designations are intended to protect nesting and migratory birds and do not cover the subtidal marine life. Local and national nature reserves⁷,

¹ Loretto, C.-J. (1992) "Seasearch survey of the Durham coastline. (Contractor: Marine Biology Consultants)" Joint Nature Conservation Committee report no. 29 (download from www.seasearch.org.uk/achievements.htm)

² See <http://jncc.defra.gov.uk/page-5705> for more information about priority species and habitats

³ See <http://jncc.defra.gov.uk/page-4527> for more information about MCZs and FOCI

⁴ See www.durhamheritagecoast.org for more information about the DHC and the Partnership

⁵ See www.turning-the-tide.org.uk for further details

⁶ See <http://www.uklandscapeaward.org/entries/showentry.php?entry=24>

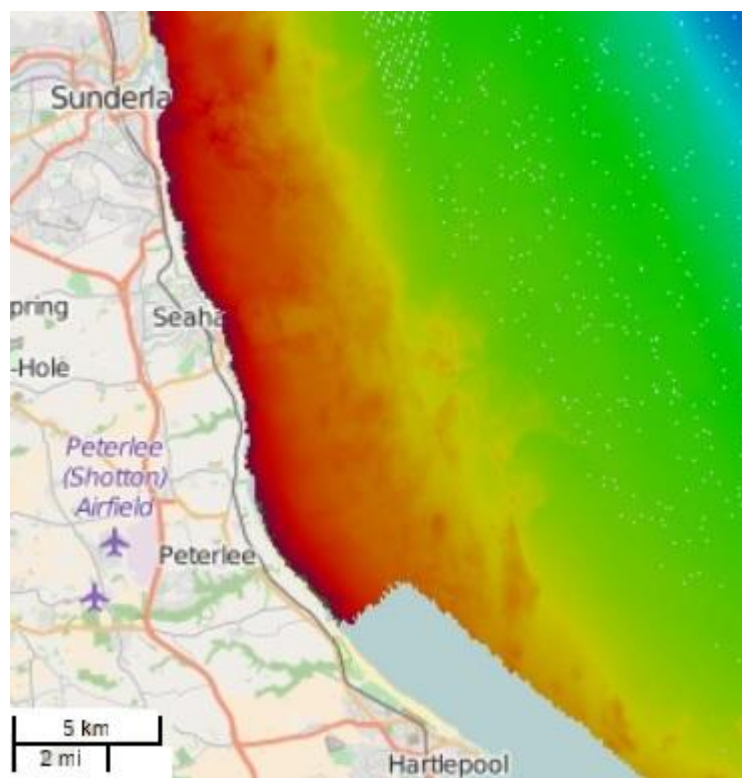
⁷ See <https://www.gov.uk/government/publications/durhams-national-nature-reserves/durhams-national-nature-reserves>

sites of special scientific interest (SSSIs) and Special Areas of Conservation (Durham Coast⁸ and Castle Eden Dene⁹ SACs, designated under the EU Habitats Directive) protect special features on land. The 389 hectares of the Durham Coast SAC contain the only example of vegetated sea cliffs on magnesian limestone exposures in the UK.

Seasearch volunteer divers originally carried out a series of survey dives in the summer of 1991. The report, available via the Seasearch website, covers twenty separate sites along the coast up to ca. 10km offshore (within the 30m depth contour). A subsequent Seasearch survey in 2009¹⁰ focused on ascertaining any seabed recovery and biodiversity increase after the clean-up operations and the five-year DHC-inspired management plan initiated in 2005. Seasearch dives have been taking place on an annual basis since then, with the weather enabling greater survey effort in some years than others! Access and logistical issues (lack of charter boats) make this a challenging area to dive.

Physical Features of the Area

The Durham Heritage Coast is formed of very ancient magnesian limestone and dolomite cliffs (from the Permian era, ca. 250-300Mya), sand dunes and rocky shores. Offshore, rocky reef and boulder outcrops are generally found in the north of the area, while sediment seabeds (both fine sands and coarser gravels, with a significant silt fraction) dominate throughout. The bathymetric plot (below left) is taken from the UKHO INSPIRE portal¹¹. The coastline is



exposed at the widest part of the North Sea (Denmark being 600km to the east) but with relatively weak tides (<1 knot even at springs). Drift is predominantly in a southerly direction. Visibility in the water column is generally poor and species diversity relatively low. Both coal lumps and dust were reported on the 2009 survey dives albeit only in small quantities, and the average underwater visibility had increased dramatically indicating a great improvement in the conditions. Surveys in subsequent years continue to reveal the recovery of this once-blighted area, signifying the resilience of the underwater environment once anthropogenic pressures are removed.

Features of the Marine Life

Both northern, boreal species and, increasingly, warmer-water Lusitanian species (exhibiting range expansion driven by anthropogenic climate change and rising sea temperatures) are found in the waters off the DHC. The turbid water gives rise to circalittoral conditions at infralittoral depths (as evidenced by the relative paucity of algal species recorded). The upper surfaces of reefs support kelp (both *Laminaria digitata* and the forest kelp, *Laminaria*

⁸ See <http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?eucode=UK0030140>

⁹ See <http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?eucode=UK0012768>

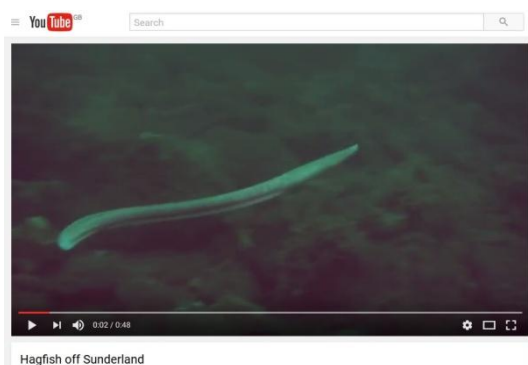
¹⁰ Lightfoot, P. (2009) "Durham Heritage Coast Seasearch Survey Report" (download from www.seasearch.org.uk/achievements.htm - scroll down to the England section)

¹¹ See <http://aws2.caris.com/ukho/mapViewer/map.action> for geospatial map viewer of the available bathymetric data

hyperborea, shown in the image below) and red algae at greater depths, with the habitat often modified by notorious grazing species such as urchins:



Scour-tolerant species such as hornwrack (*Flustra foliacea*) and dahlia anemones (*Urticina felina*) are commonly reported on DHC dives. The abundance of sessile, filter-feeding animals such as sponges and ascidians (sea-squirts) reinforces the impression of an area showing marked recovery. The 1991 survey recorded the soft coral *Alcyonium digitatum* (dead men's fingers) as the predominant animal community, with silty turf of bryozoans and hydroids; it has the sixth-highest number of DHC Seasearch records, being both abundant and easy to recognise underwater. Horse mussels, *Modiolus modiolus*, were recorded at two sites in 1991 and again in 2012 (albeit with an abundance of 'rare') – these are very long-lived molluscs (individual lifespans can exceed 40 years) and, when occurring in dense aggregations as mussel beds, create a priority habitat.



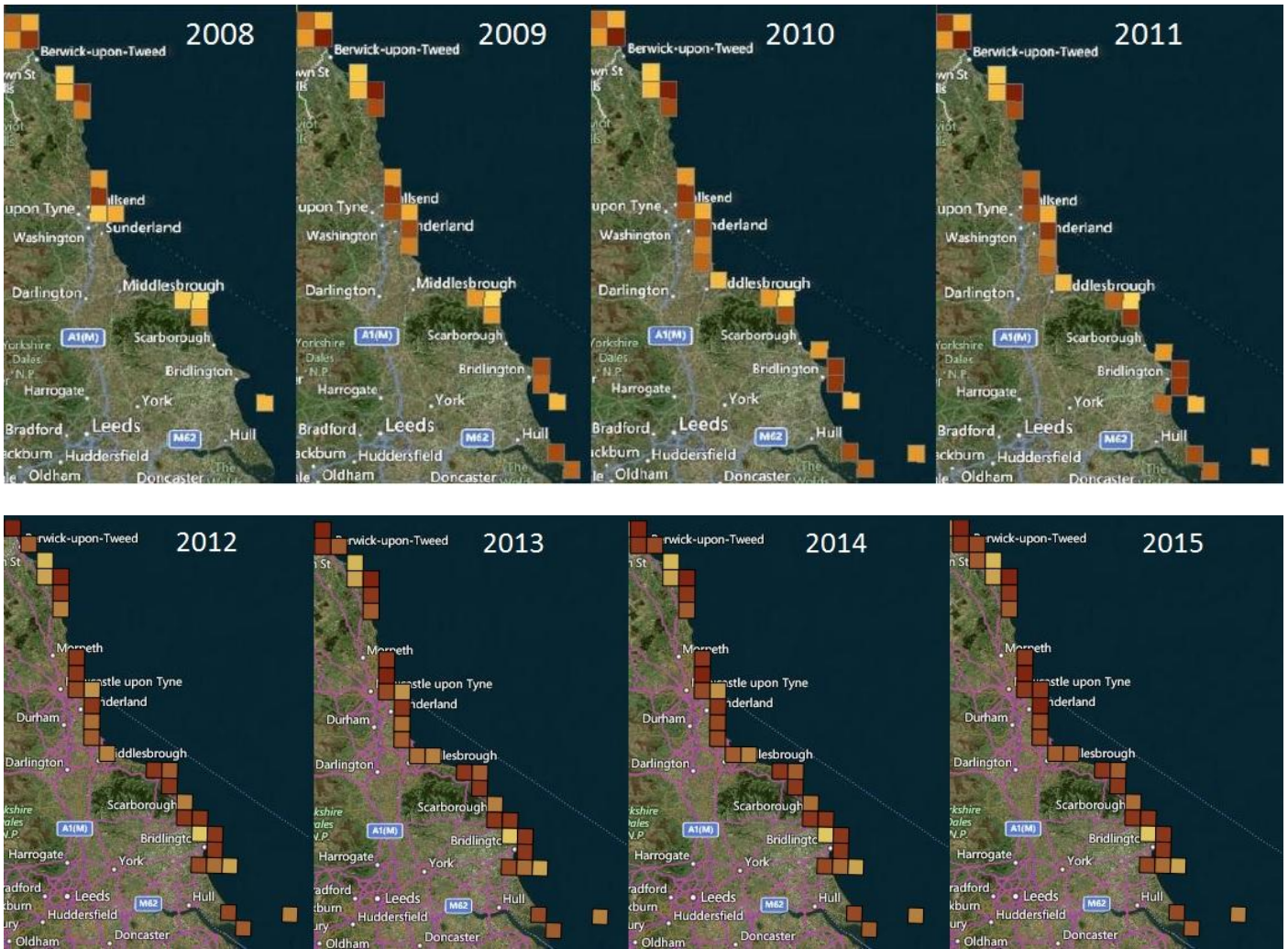
Local Seasearcher Tom Clarke was very surprised to see (and film) a hagfish off Sunderland – these fish are normally to be found offshore in much deeper water.

Watch the video at

<https://www.youtube.com/watch?v=9ILzIby69sQ&feature=youtu.be>

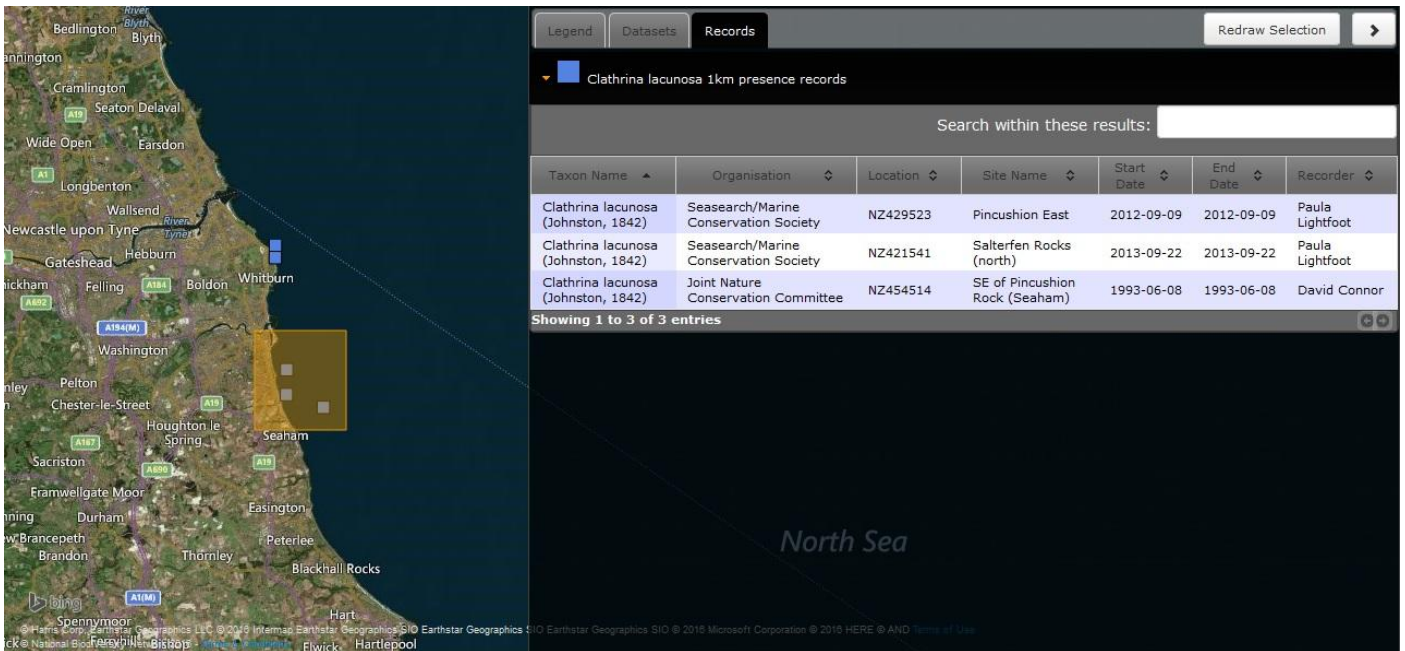
The east coast (aside from diving hotspots such as the Farne Islands) has been historically under-represented with species records on the National Biodiversity Network (NBN) Gateway¹², apart from the national MNCR survey effort of the early 1990s. However, the Seasearch East seaweed safari (2011), the Scarborough SAC Real Reefs project (2012) and ongoing Seasearch dives are all helping to build up a much fuller picture of marine life, as is shown by the following time sequence of density of species records on the NBN Gateway:

¹² <https://data.nbn.org.uk> – use the interactive map tool to visualise species records

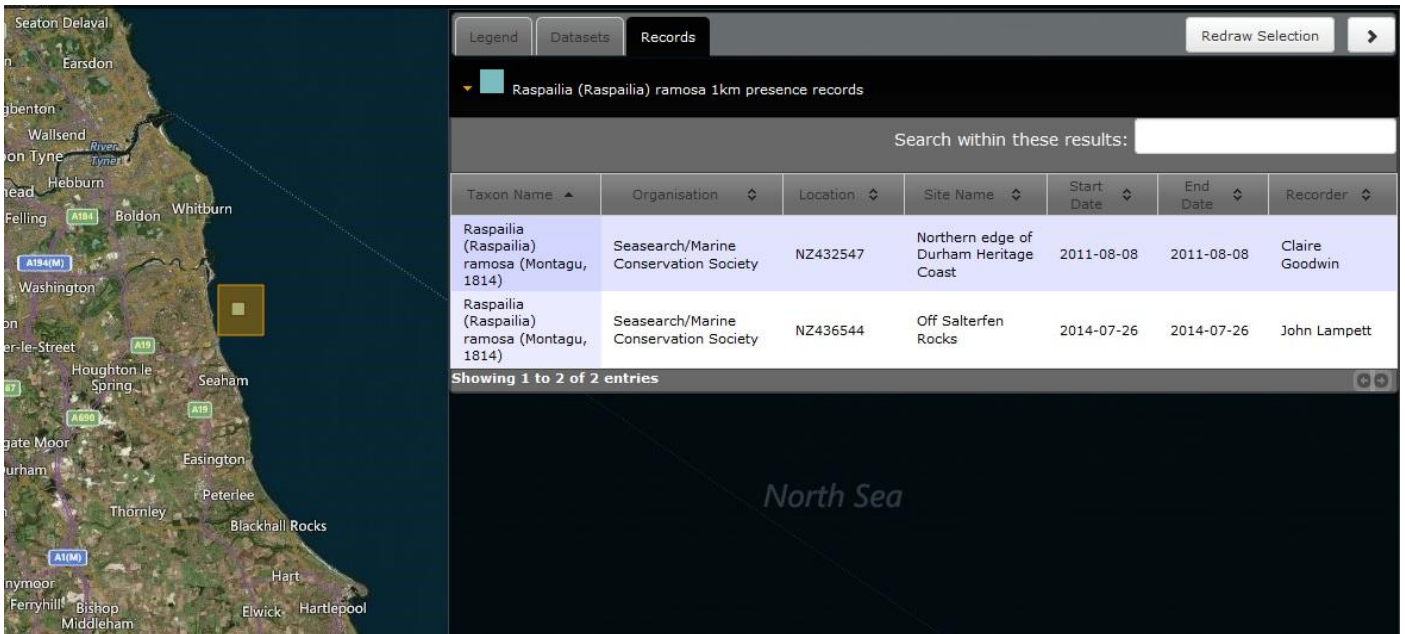


Sponges

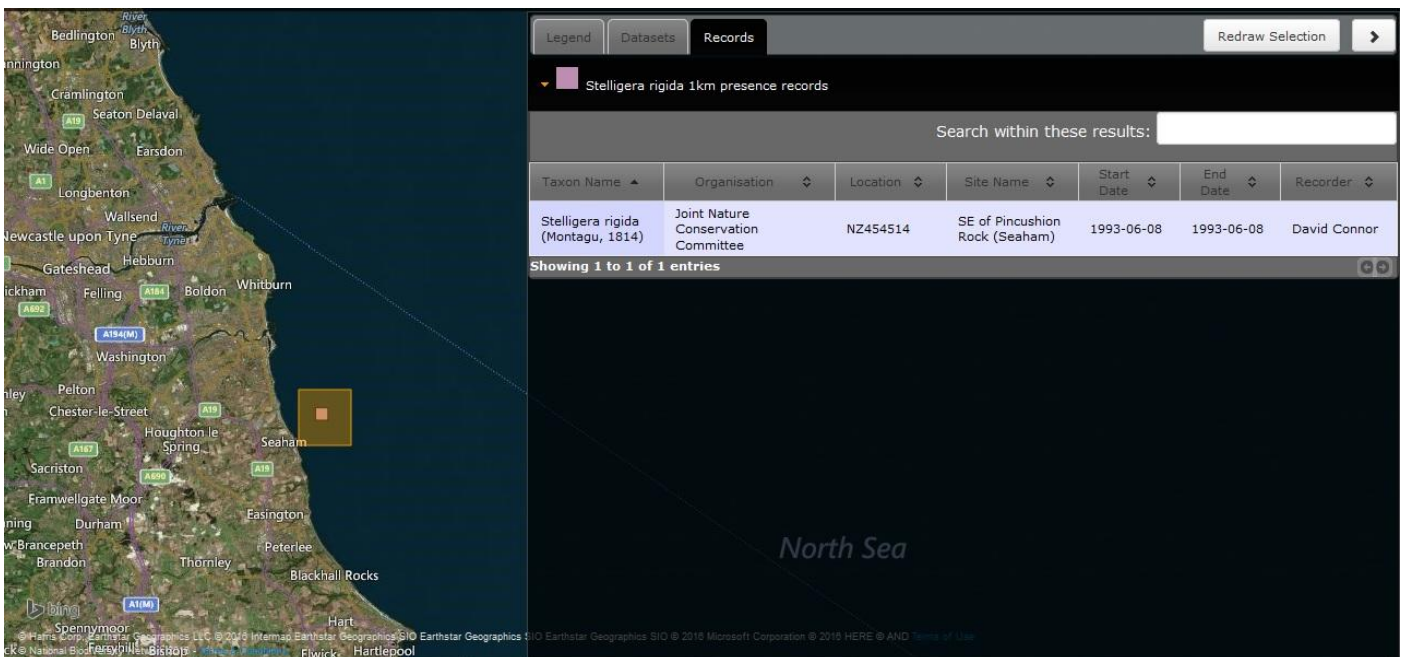
The NBN Gateway shows only 5 records on the entire East Coast for the calcareous sponge *Clathrina* (formerly *Guancha*) *lacunosa*, all but one of which originates from Seasearch surveys. There are three records on the DHC:



Similarly, the chocolate finger sponge, *Raspailia ramosa*, is represented on the NBN Gateway solely by Seasearch records, on the DHC and in North Norfolk:



One sponge photographed off the DHC on a Seasearch dive in 2016 hasn't made it to the NBN Gateway yet but will double the number of records of the species in the area. *Stelligera rigida* was recorded as part of the MNCR in 1993; Flamborough Head, North Norfolk and the Blackwater Estuary are the only other East Coast records (all Seasearch).





Exciting sponge records from Seasearch on the DHC – *Clathrina lacunosa* (above), *Raspailia ramosa* (chocolate finger sponge; above right) and *Stelligera rigida* (right; with the aptly-described appearance of ‘a grubby brain’!)

Nudibranchs

All divers love a nudibranch (sea slug), and Seasearchers are no exception. The crystal sea slug, *Janolus cristatus*, is the most-recorded nudibranch species on the DHC (33 Seasearch records).



ABOVE: *Janolus cristatus*, the crystal sea slug, and a pair with distinctive spawn



ABOVE: *Flabellina* (formerly *Coryphella*) *lineata*



ABOVE: *Flabellina pedata*, the violet sea slug



ABOVE: *Eubranchus farrani* (2nd Seasearch DHC record in 2016)



ABOVE: *Doto ?coronata* with spawn



ABOVE: *Cuthona concinna*



ABOVE: *Cuthona rubescens* on *Sabellaria spinulosa* reef



LEFT: *Geitodoris planata*, the first record for this nudibranch species on the DHC, photographed in July 2016



Some of the **tough, scour-tolerant fauna** of the Durham Heritage Coast

Acknowledgements

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Photos as credited; copyright is retained by the photographer. Seasearch are deeply grateful to the volunteer divers for their time and for submitting their records.

All Seasearch dives on the Durham Heritage Coast were carried out from the dive boat “*Spellbinder II*” and Seasearch North East are very grateful to skipper Allan Lopez for his expertise and local knowledge that made these dives such a success (www.divespellbinder.co.uk).

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Seasearch is a partnership between the Marine Conservation Society (MCS), The Wildlife Trusts, statutory nature conservation bodies and others, co-ordinated nationally by MCS and co-ordinated and delivered locally in England by Wildlife Trust and MCS local co-ordinators. For more information on Seasearch and to see all of the partners involved nationally, please visit www.seasearch.org.uk or email info@seasearch.org.uk

