



Seasearch Scotland 2012 Diving Summary Report



Seasearch diver Andy Grant surfaces from a dive off Isle of Muck (AG)

Report prepared by Calum Duncan,
MCS Scotland Programme Manager / Seasearch Scotland Co-ordinator

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Scotland during 2012 has been given by:



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Background to Seasearch in Scotland

Seasearch is a project for volunteer sports divers who have an interest in what they're seeing under water, want to learn more and want to help protect the marine environment around the coasts of Britain and Ireland. The main aim is to map out the various types of sea bed found in the near-shore zone around the whole of Britain and Ireland. In addition we are recording what lives in each area, establishing the richest sites for marine life, the sites where there are problems and the sites which need protection. MCS co-ordinates www.seasearch.org.uk across the UK.

With support from Scottish Natural Heritage there were two Seasearch co-ordinators in Scotland during this reporting phase, one national and one regional. Calum Duncan (MCS Scotland Programme Manager) continued to co-ordinate Seasearch and data entry for Scotland. At a regional level, Owen Paisley continued to co-ordinate Seasearch in Argyll and west Scotland, whilst Chris Rickard stepped back from his role as Seasearch North and Northeast Scotland Co-ordinator. An active replacement North and Northeast Scotland Seasearch Co-ordinator could not be secured. Dr Joanne Porter, a Seasearch Observer tutor and Specialist Bryozoan and Hydroids tutor at Heriot-Watt University, Edinburgh (and at the ICIT, Stromness, Orkney campus), launched the Seasearch Guide to Bryozoans and Hydroids at Heriot-Watt University in June and continued, with Jenni Kakkoken of Orkney Isles Council, to help co-ordinate increased Seasearch activity in Orkney and north Scotland.

Summary of Seasearch in Scotland 2012

The Seasearch year started with Seasearch co-ordinators and SNH agreeing a programme of work for 2012.

There followed Seasearch Observer courses run in Glasgow by Owen Paisley (eight participants – 26-27/5/12) and at Deep Blue Scuba, Edinburgh by Calum Duncan (19 participants – 29-30 August), and a Nudibranch Identification course at St Abbs organised by St Abbs VMNR Ranger Georgia Conolly and tutored by Jim Anderson, founder of the Scottish nudibranchs website (11 participants - 30/6/12 to 1/7/12).

Dr Joanne Porter of Heriot-Watt University also successfully launched her '*Seasearch Guide to Bryozoans and Hydroids*' at the University on 29 June.



Divers from Deep Blue Scuba Seasearch course completing forms in the Green Kettle after diving Loch Long (CD)

Despite the poor weather and reduced local co-ordinator activity, 246 Seasearch forms were submitted between 9 January and 9 December from the Isle of Arran to the Isle of South Uist, from St Abbs to Out Stack, Muckle Flugga, Shetland, 134 at the Observer level and 113 at the Surveyor level (46% of all forms) submitted, 2012 was the fifth busiest year on record for Seasearch in Scotland (equal with 2008 after 2010, 2009 and 2005), comprising 13% of the UK & Ireland total. Thank you to all whom submitted forms. Georgia Conolly (eight Survey and 12 Observation forms), Matthew Newsome (16 Observation), Dr Joanne Porter (11 Survey), Pat Spencer (10 Survey) and Jenni Kakkonen (four Survey and six Observation) merit particular mention for the number of forms submitted, between them over a quarter of all records submitted in 2012.

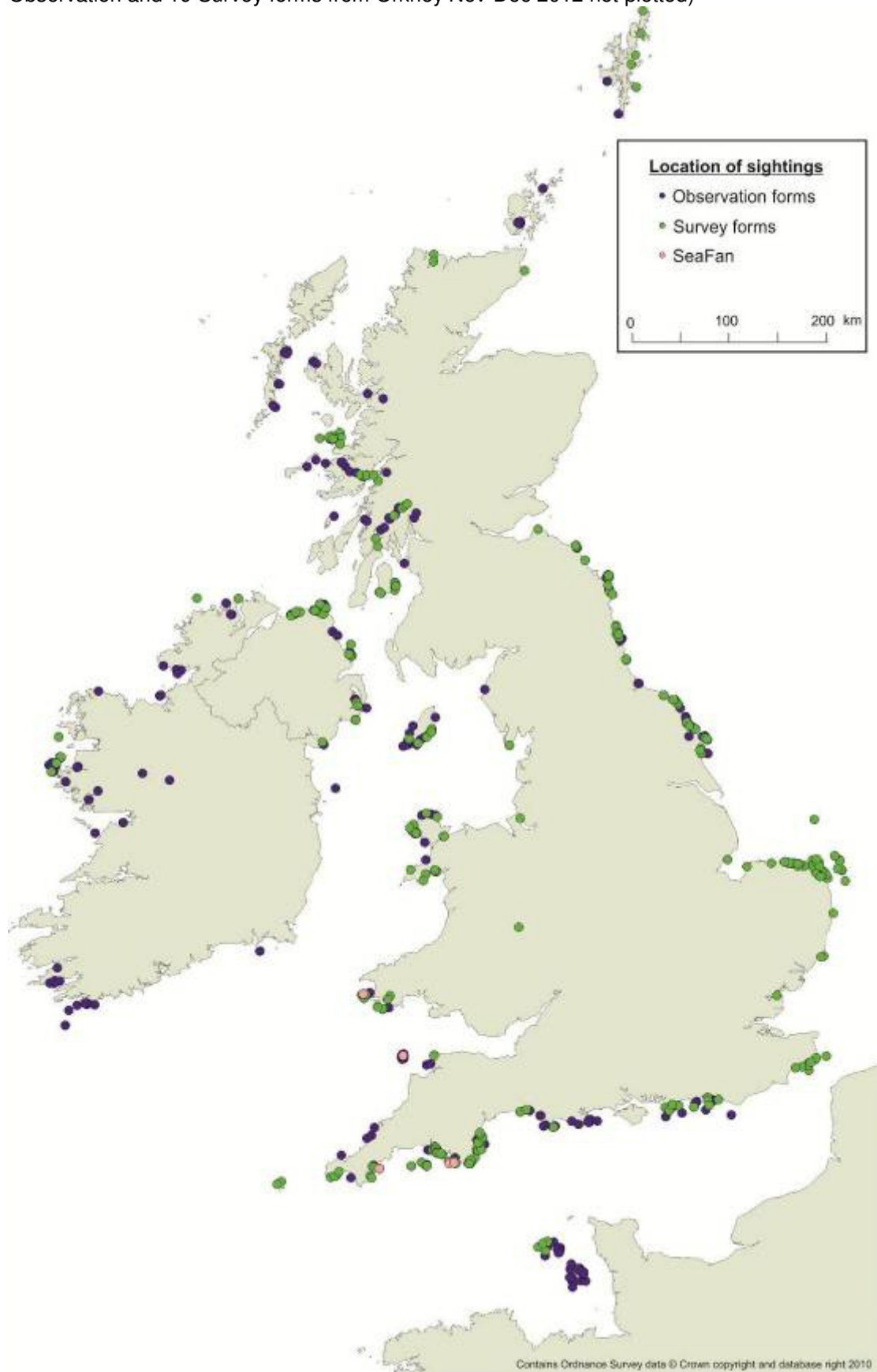
The sources of 2012 data were various, reflecting that 'any dive can be a Seasearch dive'. A total of 472 species and, where species could not be determined, genus and family were recorded as set out in Table 1 (see Appendix A for full list). Among the most recorded species were *Echinus esculentus* (recorded in 166 Survey form Habitats and Observation records), *Asterias rubens* (in 163 Survey form Habitats and Observation records), *Alcyonium digitatum* (in 144 Survey form Habitats and Observation records), *Cancer pagurus* (in 188 Survey form Habitats and Observation records) and, again the most recorded algae, *Laminaria hyperborea* (in 91 Survey form Habitats and Observation records). The greatest number of species (89) were recorded in the Mollusca phylum, boosted by the impressive 22 nudibranch species recorded at just one dive site, Skelly Pinnacle, St Abbs Head, during the aforementioned nudibranch identification course. A total of 26 nudibranch species were recorded during the weekend of the course.

Table 1 Number of taxa in each kingdom, phylum, subphylum or class recorded during Seasearch in Scotland in 2012 with some commonly recorded examples.

Kingdom, phylum, subphylum, domain or class	Number of taxa recorded (number to species level in brackets)	Some commonly recorded Taxa
Plantae	1 (1)	<i>Zostera marina</i>
Algae	61 (53)	<i>Laminaria hyperborea</i> , <i>Laminaria saccharina</i> , <i>Delesseria sanguinea</i> , <i>Dictyota dichotoma</i> , indet. algal crusts
Bacteria	2 (1)	
Porifera	31 (28)	<i>Pachymatisma johnstonia</i>
Cnidaria	77 (73)	<i>Alcyonium digitatum</i> , <i>Caryophyllia smithii</i> , <i>Cerianthus lloydii</i> , <i>Metridium senile</i> , <i>Nemertesia</i> spp, <i>Obelia geniculata</i> , <i>Sagartia elegans</i> and <i>Urticina felina</i>
Ctenophora	2 (2)	
Nemertea	1 (1)	
Annelida	20 (17)	<i>Arenicola marina</i> , <i>Lanice conchilega</i> , <i>Pomatoceros</i> spp and <i>Spirorbis</i> spp
Chelicerata	1 (1)	
Crustacea	32 (28)	<i>Cancer pagurus</i> , Cirripedia, <i>Galathea</i> spp, <i>Munida rugosa</i> , <i>Necora puber</i> , <i>Pagurus</i> spp
Mollusca	89 (87)	<i>Calliostoma zizyphinum</i> , <i>Gibbula cineraria</i> , <i>Limacia clavigera</i> , <i>Pecten maximus</i> and <i>Polycera faeroensis</i>
Brachiopoda	1	
Bryozoa	42 (38)	<i>Electra pilosa</i> , <i>Membranipora membranacea</i> , indet bryozoan crusts
Echinodermata	32 (30)	<i>Antedon bifida</i> , <i>Asterias rubens</i> , <i>Crossaster papposus</i> , <i>Echinus esculentus</i> , <i>Henricia</i> spp, <i>Marthasterias glacialis</i>
Tunicata	29 (26)	<i>Ascidia mentula</i> , <i>Ascidella aspersa</i> , <i>Botryllus schlosseri</i> and <i>Clavelina lepadiformis</i>
Fish	49 (48)	<i>Ctenolabrus rupestris</i> , <i>Gobiusculus flavescens</i> , <i>Labrus bergylta</i> , <i>Pollachius pollachius</i> , <i>Taurulus bubalis</i>
Birds	1 (1)	
Mammals	2 (2)	

See **Figure 1** for a map showing the distribution of Seasearch records in Scotland for 2012.

Figure 1 Map showing the distribution of Seasearch records (Observation, Survey, Seafan and Crawfish/Crayfish) returned from throughout UK and Ireland in 2012. (25 Observation and 19 Survey forms from Orkney Nov-Dec 2012 not plotted)



Priority Marine Features (PMFs) and other interesting records

A range of Priority Marine Features (PMFs) will inform marine conservation measures across the 'three-pillared approach' to nature conservation set out in Marine Scotland's Strategy for Marine Nature Conservation in Scotland's Seas¹. Many of these Priority Marine Features are also MPA (Marine Protected Area) search features, and the data contributed to the Scottish MPA project being run by Marine Scotland, Scottish Natural Heritage and the Joint Nature Conservation Committee (JNCC). Some PMFs and other interesting species records identified by Seasearch in Scotland during 2012 are set out in **Table 2**.



Painted goby (*Pomatoschistus pictus*) on ~5% live maerl, southwest Arran (CD)

There were a great many PMF records made in Scotland in 2012, with Orkney, Shetland, Isle of Skye and Lochs Duich, Creran, Linnhe, Long (Clyde) and Fyne in particular harbouring many examples. Overall, the most widespread PMF recorded was the horse mussel *Modiolus modiolus* (in 26 individual Survey Habitat or Observation records), although not always forming full beds, from Dury Voe (Shetland), the seabed off wrecks in Scapa Flow (Orkney), Lochs Creran, Duich, Fyne, Linnhe and Long, Tobermory Harbour and off St Abbs Head; followed by maerl (23 records), recorded in beds of varying

degrees of health from Hamars Nest (Fetlar, Shetland); SS Jane (Yell, Shetland); Swanbister Bay (dead – Scapa Flow); Sound of Eriskay; Sgeir a Chuain (Loch Bay, Isle of Skye); Ord Bay (dead – Isle of Skye); Maxwell Bank (well developed bed off Isle of Muck); Caol Scotnish narrows (very good health - Loch Sween); off Iron Rock ledges (5% live - southwest Isle of Arran) and around Holy Isle (dead - Isle of Arran). The long-lived Ocean quahog (*Arctica islandica*) bivalve was recorded in Basta Voe (Shetland), in Scapa Flow, Loch Bay (Isle of Skye) and Loch Fyne whilst the rare Fan Mussel (*Atrina fragilis*) discovered near the wreck of the SMS Karlsruhe, Scapa Flow in 2011, was confirmed as still present in 2012.

Other PMF examples recorded were the tall sea pen (*Funiculina quadrangularis*) recorded in Tobermory Harbour, Ardmucknish Bay (by the Breda), Sound of Shuna (Loch Linnhe), Loch Bay (Isle of Skye) and Loch Duich; the Celtic featherstar (*Leptometra celtica*) recorded in Loch Linnhe, the Sound of Mull and Rabbit Island (off Crinan, Argyll); the fireworks anemone (*Pachycerianthus multiplacatus*) from Loch Duich, Loch Long (Clyde), Loch Fyne and Loch Linnhe; the northern seafan (*Swiftia pallida*) from north Ardnamurchan, reefs in the Firth of Lorn, Eilean Dubh (Isle of Muck), Rubha na Cranaig (Isle of Eigg), Isle of South Uist and Loch nam Madadh; a spiny lobster (*Palinurus elephas*) from Ardnoe Point and seagrass beds (*Zostera marina*) in Halley (Deerness, Orkney), Ord Bay (Isle of Skye) and reconfirmed in Whiting Bay, Isle of Arran.

Other interesting non-PMF species recorded included pink sea fingers (*Alcyonium hibernicum*) and the large stalked jellyfish *Craterolophus convolvulus* at Bogha Na (Isle of Muck); Guillet's goby (*Lebetus guilleti*) at Hamar's Ness (west of Fetlar),

¹ <http://www.scotland.gov.uk/Topics/marine/marine-environment/Conservationstrategy>

Shetland); the scarcely recorded nudibranch *Trapania pallida* at Isle of Muck; the stalked barnacle *Scalpellum scalpellum* near the SS Thesis (Sound of Mull); the rarely recorded nudibranch *Janolus hyalinus* at Skelly Pinnacle (St Abbs); the Arctic Deeplet anemone *Bolocera tuediae* at Conger reef (Eyemouth) and the invasive non-native species *Sargassum muticum* at Kings Cross Point, Isle of Arran.

Table 2 Scottish Priority Marine Features (PMFs) and some other interesting species sightings (over) and where they were recorded during Seasearch in Scotland 2012

Priority Marine Feature	Locations recorded in 2012
<i>Arctica islandica</i>	Basta Voe (East Yell, Shetland); seabed by SMS Dresden (Scapa Flow); Clett Island (Loch Bay, Isle of Skye) and by Artilligan Cottage (west Loch Fyne)
<i>Atrina fragilis</i>	SMS Karlsruhe, Scapa Flow (re-confirmed)
<i>Funiculina quadrangularis</i>	Tobermory Harbour (Isle of Mull); by Breda (Ardmucknish Bay); Sound of Shuna (Loch Linnhe), Loch Bay (Isle of Skye) and Inverinate slipway (Loch Duich)
<i>Leptometra celtica</i>	Camas Gorm and other Morvern shore (Loch Linnhe); Rondo (Sound of Mull); SMS Köln (Scapa Flow, Orkney) and Rabbit Island (off Crinan, Argyll)
<i>Limaria hians</i>	Rubh Leam Na Laraich (Sgurr a' Murchadh, Isle of Muck)
Maerl indet.	Hamars Nest (Fetlar, Shetland); SS Jane (Yell, Shetland); off Tingwall pier (Orkney); Swanbister Bay (dead – Scapa Flow); near Hairteamul (east Sound of Eriskay); Sgeir Nam Biast and Sgeir a Chuain (Isle of Skye); Ord Bay (dead – Isle of Skye); Maxwell Bank (off Isle of Muck); by Tapti (Isle of Coll); Jeannies reef (Firth of Lorn); Caol Scotnish (Loch Sween); off Iron Rock ledges (southwest Isle of Arran) and south Holy Isle (dead - Isle of Arran)
<i>Modiolus modiolus</i>	Dury Voe (Whalsay, Shetland); SMS Brummer, SMS Karlsruhe, SMS Seydlitz, F2 barge and The Mara (Scapa Flow); Inverinate slipway (Loch Duich); Tobermory Harbour (Isle of Mull); Sound of Shuna (Loch Linnhe); Creagan Inn Bay and Queenie reef (Loch Creran); An Oitir shoal (Loch Fyne); near Finnart oil terminal (Loch Long); New Town Bay (Inveraray, Loch Fyne); near telephone exchange (east shore Loch Fyne) and off Glanmire and White Heugh (St Abbs Head)
<i>Molva molva</i>	E49 wreck (East Unst, Shetland); SMS Köln, Nevi Skerry and UB-116 (Scapa Flow, Orkney); Torr na Bithe (Loch Eriboll); Inverinate slip (Loch Duich); Godag (Isle of Muck); A-Frames (Loch Long); Clett Island (Loch Bay, Isle of Skye); Glanmire wreck (off St Abbs Head) and Conger Alley (Eyemouth)
<i>Mytilus edulis</i>	An Oitir shoal (Loch Fyne) and south of Inveraray (Loch Fyne)
<i>Pachycerianthus multiplacatus</i>	Camas Gorm and Sound of Shuna (Loch Linnhe); Ardgarten and Telephone Exchange (Loch Long); off Inveraray Pier (Loch Fyne); Cairndow View (Loch Fyne) and Inverinate slipway (Loch Duich)
<i>Palinurus elephas</i>	Ardnoe Point (Loch Crinan)
<i>Parazoanthus anguicomus</i>	Calve Island (Isle of Mull); Eilean Dubh (Isle of Muck); Onsa reef, Tyne reef and Jeannies reef (Firth of Lorn) and Loch Bay pinnacle (Loch Bay, Isle of Skye)
<i>Swiftia pallida</i>	Elizabeth rock and surrounding reefs (north of Ardnamurchan); Eilean Dubh (Isle of Muck); Rubha na Cranaig (Isle of Eigg); Jeannies reef and Onsa reef (Firth of Lorn); Ushenish lighthouse (Isle of South Uist) and Modah Mor and South of Modah Granmach (Isle of North Uist)
<i>Zostera marina</i>	Kings Cross Point and Whiting Bay (Isle of Arran); Halley and Tingwall Pier (Orkney) and Ord Bay (Isle of Skye)

Some other interesting species records	Locations recorded in 2012
<i>Alcyonium hibernicum</i>	Bogha Na (Isle of Muck)
<i>Bolocera tuediae</i>	Conger reef (Eyemouth)
<i>Capnea sanguinea</i>	Near SS Thesis (Sound of Mull)
<i>Diazona violacea</i>	Rubha ant-Sasunnaich (Loch Linnhe); Garvellachs, Jeannies reef and Onsa reef (Firth of Lorn); Loch Bay (Isle of Skye); Calve Island, Rondo and Hispania (Sound of Mull) and Ardnoe Point (Loch Crinan)
<i>Guancha lacunosa</i>	200m WSW Elizabeth rock (north Ardnamurchan)
<i>Haliclystus</i> spp	Camas Mor cliffs (Isle of Muck)
Indet. ascidian	Stallion rock (Loch Fyne)
<i>Janolus hyalinus</i>	Skelly pinnacle (St Abbs)
<i>Lebetus guileti</i>	Hamar's Ness (west of Fetlar, Shetland)
<i>Liparis</i> spp.	Deer Sound and SMS Köln (Scapa Flow, Orkney)
<i>Craterolophus convolvulus</i>	Bogha Na (Isle of Muck)
<i>Neoturris pileata</i>	Bard's Cave (south Bressay, Shetland)
<i>Nephrops norvegicus</i>	Inverinate slip (Loch Duich); Tobermory Harbour (Isle of Mull); Sound of Shuna (Loch Linnhe) and Tarbert Harbour pontoons (outer Loch Fyne)
<i>Sargassum muticum</i>	Kings Cross Point (Lamlash Bay, Isle of Arran)
<i>Scalpellum scalpellum</i>	Near SS Thesis (Sound of Mull)
<i>Scinaia</i> spp	Hoo Stack, Dury Voe, Hamars Ness (Shetland); Nevi Skerry (Scapa Flow) and Godag and Ferry terminal (Isle of Muck)
<i>Trapania pallida</i>	Bogha Eir and Fionn-Ard, Camus Mor (Isle of Muck)



Indeterminate predatory ascidian at Stallion Rock, Loch Fyne (GB)

It is worth noting that Seasearch Surveyor George Brown photographed a remarkable encounter in Loch Fyne in November 2012. At popular dive site Stallion Rock, George descended to 18m and found a small indentation in the wall at the back of which was a sessile ascidian. After taking some photographs, the ascidian was witnessed lunging at a small amphipod, perhaps 2-3mm in length, and then swallowing it whole. It has only been possible to identify this as a predatory ascidian, normally found at depths of 1,000-2,000m.

1 Co-ordinated Seasearch events in Scotland 2012

The two active Seasearch co-ordinators organised a number of dedicated Seasearch diving events throughout Scotland in 2012. In the report, more detail has been provided where the co-ordinator organised or attended a diving event.

1.1 Scotland Co-ordinator Calum Duncan

Sound of Mull, Outer Loch Linnhe, Ardnamurchan, Eigg and Muck 15-18 June
Seven Survey and Seven Observation

A group of Seasearch divers from Edinburgh, Inverness, Derby and Leeds travelled to Lochaline originally to dive South Uist on a trip organised by Michael Bramham on the MV Peregrine, with Seasearch support from Calum Duncan. However, Force seven northerlies prevented a crossing of the Minch and instead sites around outer Loch Linnhe, Sound of Mull, Ardnamurchan peninsula and the Isles of Eigg and Muck were surveyed. At Calve Island, a rich tide-swept wall covered in a dense growth of peacock worms (*Sabella pavonina*), soft corals, sponges, football seasquirts (*Diazona violacea*) and, swathing the underhangs they prefer, the nationally scarce white cluster anemone (*Parazoanthus anguicomus*) was surveyed. Across the Sound at Ardness point, tidswept ledges were packed with soft coral, leafy bryozoa (*Flustra foliacea*, *Securiflustra securifrons* and *Bugula* spp) among which preyed crystal sea slugs (*Janolus cristatus*). The shallow algae zone was very rich and included very large sea lettuce (*Ulva lactuca*) equivalent to small kelp blades in size.

At the southeastern end of the Sound, the SS Thesis is clad with soft corals (*Alcyonium digitatum*) and lies on a boulder slope rich in life, including oaten-pipe hydroids (*Tubularia indivisa*), *Coryphella lineata* nudibranchs, leafy bryozoan (*F.foliacea*), *Tritonia hombergii* and their *A. digitatum* prey, and numerous wrasse, with rich seaweed growth on the shallower bedrock reef. Interesting species recorded here included the imperial anemone (*Capnea sanguinea*) and the stalked barnacle (*Scalpellum scalpellum*). On the under-recorded



Ballan wrasse (*Labrus bergylta*), *Tubularia indivisa* and *Alcyonium digitatum* by SS Thesis, Sound of Mull (CD)

Morvern shore of outer Loch Linnhe, an interesting boulder and mixed muddy sediment slope supports a mix of sea loch and open coast life, including *Tubularia* and the Priority Marine Feature Celtic featherstar (*Leptometra celtica*). The fireworks anemone *Pachycerianthus multiplacatus* was recorded by Mike Bramham and Andy Young on a second dive later in the trip in the area.

Off the north coast of the Ardnamurchan peninsula, a near pristine undisturbed reef west of Elizabeth rock, dubbed 'Danny's Buoy' by the boat skipper, was crowned with tall kelp park (*Laminaria hyperborea*), among which *A. digitatum* thrived in the clear waters, including on the stipes. The reef then drops vertically to a step at 36m and then beyond, with every face and angle swathed in varied hues of jewel anemone (*Corynactis viridis*) and soft corals (*Alcyonium digitatum*) clinging onto the most tideward edges.



Life abounded in the clear waters of the reef 200m southwest of Elizabeth rock (CD)

At 36m and deeper, the bright orange stagshorn bryozoan *Porella compressa* was recorded, including an unusually large colony half the size of a football recorded by George Brown at 40m. Also recorded in this semi-exposed deep reef biotope were Devonshire cup corals (*Caryophyllia smithii*), northern sea fans (*Swiftia pallida*) and a range of sponges, including the striking blue *Hymedesmia paupertas*. A reef south of Elizabeth rock was also recorded as part of an expedition to the Isle of Muck in July (see 2).



Cotton-spinner sea cucumber (*Holothuria forskali*) on urchin-grazed boulders near Camas Mor wall, Isle of Muck (CD)

A scenic wall comprising hexagonal basalt columns with *A. digitatum*, *C. smithii*, *Clavelina lepadiformis* and *Swiftia pallida* was recorded at Rubha na Cranaig, east Isle of Eigg. At Camas Mor on the southern tip of the Isle of Muck, a wall rich in jewel anemones (*C. viridis*), *A. digitatum* and the sandaled anemone *Actinothoe sphyrodeta* were recorded as well as large urchin-grazed boulders with many cotton-spinner sea cucumbers (*Holothuria forskali*), bryozoans (*Parasmittina trispinosa* and *Plagioecia patina*), sea slugs *Diaphorodoris luteocincta*, *Polycera faeroensis* and one record of *Colpodaspis pusilla*, a tiny sea slug with an internal shell.

The survey concluded at Balevoulen on the western shore of Isle of Lismore, a site that had not been recorded during Seasearch Lismore 2010, where among other species, seaweeds such as *Heterosiphonia plumosa* and *Phycodryis rubens*, the sponge *Guantha lacunosa*, the crinoid *Antedon bifida*, the long-clawed squat lobster *Munida rugosa*, a curled octopus *Eledone cirrhosa*, the sea loch anemone *Protanthea simplex* and the sea squirt *Ascidia mentula* were all recorded on this silted sea loch slope.

South and East Arran 30 June – 1 July 2013
11 Survey forms



Rigid Hulled Inflatable Boat (RIB) with Leigh Howarth coxing and Seasearch Surveyor Thomas Kerr heading to north Holy Isle (GL)

This weekend was organised to provide further Seasearch information to inform the South Arran nature conservation Marine Protected Area third party proposal submitted by the Community of Arran Seabed Trust (COAST) to the Scottish MPA project. Divers, including Howard Wood and Angus Robson of Community of Arran Seabed Trust (COAST), Seasearch Northeast England Co-ordinator Paula Lightfoot, Seasearch Surveyors Nicola Faulks and Thomas Kerr, Seasearch Scotland Co-ordinator Calum Duncan and hydroid and bryozoan expert Dr Joanne Porter, converged on Lamlash pier from Isle of Arran, Edinburgh, Carnwath, Newcastle and further afield. Prevailing southwesterly winds on the first day forced diving in Lamlash Bay, concentrating effort on a small area of the Community Marine Conservation Area/No-Take Zone to the north of Holy Isle and on unrecorded areas to the southeast. Beds of dead maerl gravel were predominant on both dives, although still relatively species rich: spiny starfish (*Marthasterias glacialis*), burrowing anemones (*Cerianthus lloydii*), crabs, hydroids and seaweeds created a rich tapestry. South of Holy Isle, the dead maerl gravel with *M.glacialis* and *C.lloydii* descended southeastward to 20m beyond which the water got murkier and broken *Ensis* spp shells more frequent on the seabed.

Fortunately the wind dropped the following day, allowing multiple sites southwest of Arran to be surveyed in an area recorded as an historic herring spawning site, thought likely to be a potential site for a maerl bed. An area of boulders and small bedrock outcrops, protruding from shell gravel seabed and turfed with sea firs (*Nemertesia antennina* and *N.ramosa*), red seaweed and bryozoans (including *Disporella hispida*, *Fenestrulina malusii*, *Puellina innominata*), descends to an underwater landscape of large maerl gravel waves, approximately 1m wavelength and 15cm depth with estimated 5% live maerl cover. At the south end of Whiting Bay sea grass (*Zostera marina*) was re-recorded, giving way to a sandy seascape of seaweed (*Saccharina latissima* and *Chorda filum*), crabs (such as *Liocarcinus depurator* and *Necora puber*) and, burrowed beneath small depressions, sea potatoes (*Echinocardium cordatum*).



Spiny starfish (*M.glacialis*) and burrowing anemones (*C.lloydii*) on dead maerl bed, southeast Holy Isle, Arran (GL)

Another dive off Kings Cross Point, the southern promontory of Lamlash Bay revealed a reef with seaweeds (including *S.latissima*, *Desmarestea aculeata* and *Dilsea carnosa*), peacock worms (*Sabella pavonina*) and in sedimentary areas the anemones *Cerianthus lloydii* and the less often recorded *Sagartiogeton undatus*.

Loch Long 9 September
Six Observation forms



Featherstars (*A.bifida*) on horsemussels (*M.modiolus*) near Finnart, Loch Long (CD)

Following a Seasearch Observation course run by Calum Duncan for 19 participants held over two midweek evenings at Deep Blue Scuba, Edinburgh, Seasearch dives were organised at Finnart terminal, Loch Long the following Sunday. Most course participants attended the diving in Loch Long, completing two qualifying forms each, and six of these were subsequently submitted. The A-frames and E-frames were covered in typical sea loch life (such as *Ascidiella aspersa* and *Sabella pavonina*) and the seabed here and at the neighbouring 'anemone gardens' site had occasional

horsemussels (*Modiolus modiolous*), shore urchins (*Psammechinus miliaris*), featherstars (*Antedon bifida*) and mobile species such as harbour crabs (*Liocarcinus depurator*).

1.2 Argyll and West Scotland Co-ordinator Owen Paisley

Loch Fyne and Loch Long 9 and 15 January
Two Observation forms



Seasearch Argyll and West Scotland Co-ordinator Owen Paisley surveying Loch Fyne

Following a request from Owen Paisley, a group of six Glasgow based divers dived the west shore of Loch Fyne at Drishaig and a known shore dive site near the telephone exchange on the east shore of Loch Long to confirm a report of Fireworks Anemones (*Pachycerianthus multiplicatus*). Three *P.multiplicatus* were recorded in Loch Long by Steven Melvin along with a miscellaneous collection of glass bottles and car tyres. No anemones were recorded at the Loch Fyne site, though once again tyres and cans were reported.

Tarbert, Loch Fyne 31 January
One Survey form

This was a pre-season warm up dive for a group of active Argyll Seasearch divers led by Owen Paisley. The opportunity was taken to test a Global Positioning System (GPS) tracking system using a Surface Marker Buoy (SMB) and small GPS unit.

Artilligan, Loch Fyne 25 March and
1 April
One Observation and two Survey forms

A previously undived site in Loch Fyne, seven miles south of Lochgilphead was surveyed, with boulders descending to a fine sand slope at 44m where evidence of dredging damage was recorded, including broken shells and starfish with regenerating limbs. Species records included queen scallop (*Aequipecten opercularis*), spiny starfish (*M. glacialis*), cushion star (*Porania pulvillus*) and the PMF blue mussels (*Mytilus edulis*).

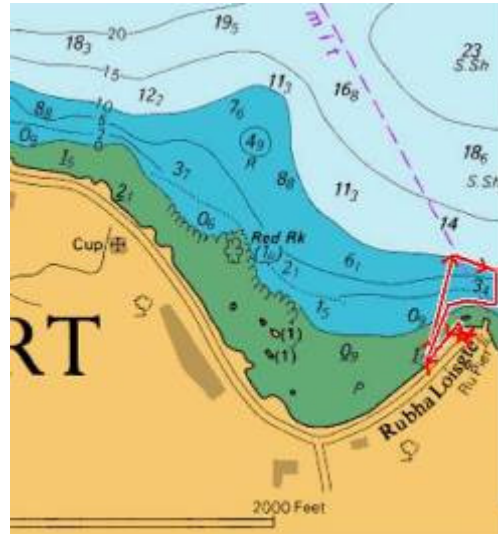


Chart of GPS track using GPS/SMB system at the end of Pier Road, Tarbert (OP)

Inveraray, Loch Fyne 22 April 2012
Three Observation forms

Dive was arranged for participants in an Observer course run in Glasgow on 15 October 2011. Large numbers of Fireworks anemones (*P. multiplacatus*) and scattered horsemussels (*Modiolus modiolus*) were recorded at Inveraray pier and a large blue mussel (*M. edulis*) bed recorded at An Oitir shoal to the south of Inveraray.

Quarry Tea Rooms, Loch Fyne 27 May
Two Observation forms

This was a training dive for Glasgow based divers off the Quarry tearooms, one mile north of Minard on west Loch Fyne. The only noteworthy recordings were discarded fishing line, old moorings, creels and fish farm moorings for the nearby fish farm.

Scotnish Narrows, Loch Sween 3 November
One Survey form

During this dive a rich variety of life was recorded on and around the healthy bed of maerl (*Lithothamnion glaciale*) in Scotnish narrows at the southern end of the survey, including seaweeds (such as *Halidrys siliquosa* and *Ascophyllum nodosum*), sponges (*Tethya citrina*), snakelock anemone (*Anemonia viridis*), *Sagartiogeton laceratus* anemone, sea lemon (*Archidoris pseudoargus*), parchment worm (*Chaetopterus variopedatus*), sand star (*Astropecten irregularis*), brittlestars (*Ophiocomina nigra* and *Ophiothrix fragilis*), ascidians (*A. aspersa*) and fish, including Bib (*Trisopterus luscus*) and rock cook (*Centrolabrus exoletus*). The completed form was provided to Dr Colin Moore of Heriot-Watt University to assist in planning University survey work in Loch Sween in 2013 to inform proposals for Loch Sween proposed nature conservation Marine Protected Area as part of the Scottish MPA project.

Tarbert Harbour, Loch Fyne, 11 November
One Observation form

This was an unusual Seasearch dive carried out by Owen Paisley and Seasearch diver John Rees. They recorded remarkably clear water and an extensive sewage bacterial (*Beggiatoa* sp) mat covering the soft mud seabed in the centre of the harbour under the yacht pontoons, resembling a snowfield. The mooring chains were covered in ascidians (*Ciona intestinalis*), whilst blue mussels (*M. edulis*) and langoustine (*Nephrops norvegicus*) were also recorded in the sediment.

Cruibasdale Lodge, West Kintyre 30 November
One Observation form

A club dive by Campbeltown Scottish SAC attended by Seasearch coordinator Owen Paisley during where a shallow bedrock reef was surveyed very rich with species including furbelows kelp (*Saccorhiza polyschides*), sea oak (*Halidrys siliquosa*), northern tooth weed (*Odonthalia dentata*), discoid fork weed (*Polyides rotundus*), blue rayed limpet (*Helcion pellucidum*) and the gooseberry sea squirt (*Dendrodoa grossularia*) were all recorded.

1.3 Scapa Flow, Orkney and surrounds



Dr Joanne Porter briefs Seasearch divers before surveying SMS Karlsruhe (BA)

An impressive level of Seasearch-supported activity took place in Orkney, diving from MV Halton (skipper, Bob Anderson) and voluntarily co-ordinated by Seasearch Surveyor Dr Joanne Porter of Heriot-Watt University and Seasearch Observer Jenni Kakkonen of Orkney Isles Council with Orkney and Shetland divers Bob Beharie, Ann Bignall, Amy Houston, Ivan Houston, Penny Martin, Jim Polson, Rachel Shucksmith and Richard Shucksmith and visiting divers including Georgia Conolly. Most were submitted on two

Seasearch trips focused on describing marine life on the wrecks of Scapa Flow and contributing to www.scapaflowwrecks.com. Other divers also visited Orkney and returned Seasearch records (see 3).

SMS Karlsruhe and SMS Köln, Scapa Flow 24-25 November by Dr Joanne Porter and Bob Anderson
Six Observation and three Survey forms

For more than 90 years the wreck of the Karlsruhe has lain on a sandy seabed in Scapa Flow, providing substrate for sedentary animals, providing protection and security in an otherwise exposed location. Cup corals (*C. smithii*) and keelworms dot the metal surfaces, crustaceans such as edible crab (*Cancer pagarus*) hide in crevices, yellow ringed seasquirts (*Ciona intestinalis*) sheath cables and the thick white fur of budding Moon jellyfish (*Aurelia aurita*) scyphistomae cloak underhangs within the wreck. Where the tide moves quickest, soft corals (*A. digitatum*) cling to the pinnacle davits at the stern, a dense forest of plumose anemones (*Metridium senile*) dominates the hull side of the stern and several species of erect hydroid dominate, including the branched antenna hydroid *N. ramosa*, *Sertularella rugosa* and *S. polyzonias* among which nudibranch egg masses are seen. On uppermost surfaces long-legged spider crabs are seen amongst the red seaweeds and hydroids.

Large shoals of Pollack (*Pollachius pollachius*) offer protection in number whilst scorpion fish (*Taurulus bubalis*) use camouflage within seaweed and hydroids for protection. Ballan wrasse (*Labrus bergylta*) swim amongst the wreckage defending their territory.

In deeper water to the starboard side of the deck, a layer of brittlestars (*O. fragilis*) covers a rich horse mussel bed (*M. modiolus*). Broken mussel shell fragments cover the seabed, with encrusting sea mats (*P. trispinosa*), keelworms (*Spirobranchus triqueter*) and saddle oysters (*Anomia ephippium*) among the debris. Amongst the fragments of broken shells, a solitary rare Fan mussel (*Atrina fragilis*) was recorded, its bright yellow mantle exposed.



Yellow-ringed seasquirts (*Ciona intestinalis*) and hydroids cluster on SMS Karlsruhe (JP)

Towards the hull the seabed has much coarser sand and is home to fast moving Queen scallops (*Aequipecten opercularis*) and crabs (*C. pagarus* and *Hyas araneus*). Other dominant predators include common starfish (*Asterias rubens*) and bright red and yellow striped sunstars (*Crossaster papposus*).

One dive on SMS Köln as part of this weekend revealed a bait ball of poor cod (*Trisopterus minutus*) and bib (*T. luscus*) being predated by diving guillemots (*Uria aalge*).

SMS Seydlitz, Barrel of Butter and Swanbister Bay, Scapa Flow 24-25 Nov Seven Observation and four Survey forms

Seasearch Surveyor and underwater photographer Rachel Shucksmith recorded the broken up wreck of SMS Seydlitz laying on the Scapa Flow seabed with *M. modiolus*, *C. lloydii* anemones and queen scallops (*A. opercularis*). Very large shoals of fish (including *P. pollachius* and *P. virens*) were recorded around the wreck, which supported a typical assemblage of algae, anemones, annelids, crustaceans, echinoderms and hydroids.

The Barrel of Butter is a small rock island in Scapa Flow. Beneath the waves Jenni Kakkonen recorded a reef covered in angular boulders with *Saccharina lattissima* park and mixed algae, leading to sand and shell gravel with mostly mobile life. An unidentified yellow crust was recorded on some rocks, several species of hydroid (including the less often recorded *Plumularia setacea* and *Clytia hemisphaerica*), bryozoan (including *Disporella hispida*, *P. trispinosa* and *Electra pilosa*) and nudibranch (*Polycera quadrilineata* and *Limacia clavigera*) and siphonophores and sea gooseberries (*Beroe cucumis*) in the water column.

At Swanbister Bay, Jenni Kakkonen recorded a gentle slope of muddy sand and dead maerl gravel with burrowing *C. lloydii* anemones, lugworms (*Arenicola marina*), sandmason worms (*Lanice conchilega*), sea potatoes (*Echinocardium cordatum*) and crabs.

SMS Kõln, Scapa Flow 7-8 December by Dr Joanne Porter and Bob Anderson
Three Observation and two Survey forms

On a second weekend of Seasearch diving in Scapa Flow, 57 species were recorded on the tideswept wreck of SMS Kõln. Along the length of the hull, two forms of bright orange golf-ball sized *Suberites* sponges were recorded: a compact ball with an obvious hole in the top and a more extensive crust with several holes (osculata). Cup corals (*C.smithii*) were abundant, sometimes solitary, sometimes in groups. Amongst the animal turf, the hermit crab *Pagurus prideaux*, with accompanying cloak anemone *Adamsia carciniopados*, and sunstar *Crossaster papposus* roam and, where patches of sediment gathered, *Ophiura albida* brittlestars are found.

At 25m depth astern, a broken section of wreck reveals the inside, where shoals of small gadoids and a solitary Wolf fish *Anarhichas lupus* were recorded. Inside, the walls and roof are coated *A.aurita* scyphistomae. Well-developed colonies of the branching sponge *Haliclona* were recorded along the edge of the deck and *M.senile* anemones, among which crawl colonise protruding metal struts. The deck itself is covered in a dense patchwork of sponge and sea squirt turf sea mat crusts.

UB-116, Nevi Skerry, The Mara and The F2 Barge, Scapa Flow 7-9 December
Six Observation and seven Survey forms

The UB-116, Nevi Skerry, The Mara and the F2 and Barge were all dived the same long weekend by the team of 11 Seasearch Observers and Surveyors (including Joanne Porter and Georgia Conolly) that had carried out Seasearch on the SMS Kõln. The remains of the German submarine UB-116 lie on very flat mud with slender sea pens (*Virgularia mirabilis*), burrowing anemones (*C.lloydii*) and lugworm (*A.marina*) casts at the mouth of Pan Hope, a large inlet on the east side of Flotta. The PMF ling (*Molva molva*) was also recorded here. Cnidarian turf dominates the wreckage itself.



Edwardsia anemones on The Mara, Scapa Flow (RS)

Nevi Skerry comprises rocky reef with angular boulders descending to shell and sand gravel seabed with waves. Furbelows kelp park (*Sacchoriza polyschides*), mixed seaweeds and pink encrusting algae dominate the reef and boulders, whilst King scallops (*P.maximus*) and worms (*L.conchilega* and *Chaetopterus* spp) were recorded in the gravel. Scinà's weed (*Scinaia* spp) was also recorded here. The wooden MV Mara was sunk in Gutter Sound in 1995. During this weekend, the wreck was recorded as being covered in

featherstars (*A.bifida*) whilst the hydroids *Eudendrium*, *Halecium beanie* and *Clytia hemisphaerica* (among others) and the scarcely recorded starfish *Stichastrella rosea* were also recorded. On the seabed nearby several live *M.Modiolus* and some empty *Modiolus* shells were recorded.

Occasional *M.Modiolus* and a lot of empty *Modiolus* shells were also recorded on the coarse sand and shell gravel seabed by the WW2 wreck of the F2 and barge. Hydroids (such as *Halopteris catharina*, *N.antennina*, *P.setacea* and *Sertularella polyzonias*) and ascidians (*A.aspersa* and *Lissoclinum perforatum*) dominated the wreckage itself, with some mixed seaweed (including *Plocamium cartilagineum*).

2 Independently organised Seasearch activity

Isle of Muck and surrounding sites 8 – 13 July by Angela Gall
Five Observation and 11 Survey forms

An intensive week of surveys to gather new data on 13 sites around the Isle of Muck was organised by Seasearch Surveyor Angie Gall with boat skipper and marine biologist Mark Woombs (Sea Knoydart) and six other Seasearch Surveyors (Rob Adams, George Brown, George Gall, Andy Grant, Emily Priestley and Dawn Watson). In total 236 species were recorded. Although there has been previous Seasearch diving around the island, including July 2006 and June 2012, this dedicated survey focusing on Muck was the first of its kind. Thirteen sites around Muck and the wider area were surveyed. Good weather and sea conditions made it possible to dive all sides of the island as well as some sites further out, such as a rocky pinnacle that appeared on the Admiralty chart 6 miles to the west of Muck.



Pressed algae from Seasearch expedition to the Isle of Muck (AG)

On the south side of Muck, sea cliffs continue underwater, typically fringed by kelp forest descending to a steep boulder slope at the base. Overhangs with *C.smithii* cup corals and the unusual pink sea fingers *Alcyonium hibernicum* were recorded at Bogha Na, the large stalked jellyfish *Craterolophus convolvulus* on red seaweed growing on the kelp stipes. White cluster anemone *P.anguicomus* and northern sea fan *S.pallida* PMFs were recorded at Eilean Dubh. On the exposed west side, the seabed slopes more gently, with a band of kelp forest thinning to kelp park with depth. The boulders and cobbles beneath the kelp have encrusting bryozoans (such as *Porella compressa* and *Cellepora pumicosa*), sponges (including the striking blue *Hymedesmia paupertas* and *Myxilla incrustans*), barnacles and keel worms on their surfaces.

Godag is a small rocky islet off the northern coast of Muck fringed with kelp forest gently descending to cobbles that slope to a vertical wall at 16m. The only site surveyed off north Muck, it appeared siltier than other sites with lower biodiversity than expected on the wall. It is speculated that this may be due to scallop dredging in the channel between Muck and Eigg. The PMF link (*M.molva*) was recorded here. Diving Eagamol, a tiny island off the north west of Muck revealed an unusual habitat dominated by the bryozoan *Securiflustra securifrons* carpeting gently sloping rock from 20-30m with finger bryozoan *Alcyonidium diaphanum* and antenna hydroids *N.antennina*. Surge gullies with sponge communities were found in the shallows.



Dense bryozoan and hydroid turf, Isle of Muck (DW)



Polycera quadrilineata on kelp, Isle of Muck (DW)

Maxwell Bank, south of Isle of Eigg, has a fairly level seabed scattered with large boulders, sheltering a well developed bed of live maerl in between. Scallops (*P.maximus*), squat lobsters (*M.rugosa*) and occasional edible crabs (*C.pagurus*) were recorded on the maerl. It is speculated that the large boulders protected the maerl bed from damaging activities such as scallop dredging. Further south at Elizabeth rock off Ardnamurchan (near which was surveyed on 17 June: see 1.1), the kelp forest on top of the rock was full of fish like ballan wrasse *Labrus bergylta* with many *A.digitatum* growing on stipes which, as observed west of Elizabeth rock. However, the sheer vertical wall was carpeted in *Antedon bifida* featherstars.

An unnamed pinnacle six miles to the west of Isle of Muck, first surveyed on a Seasearch trip to South Uist in 2006, was revisited during this 2012 survey.

The shallowest part was about 3m deep with steep walled gullies running south east, heavy scouring indicating the great exposure of the site. An unusual red blenny *Parablennius ruber* was spotted (as in 2006) in a crevice and *Porania pulvillus* cushion stars, Devonshire cup corals (*C.smithi*) and crevice sea cucumbers (*Pawsonia saxicola*) were on the walls. A shore dive at Port Mor ferry terminal revealed a shallow sandy bay with scallops, burrowing anemones (*C.lloydi*) and small flatfish and diverse algae attached to the jetty and boulders.

The clear waters above rocky habitat surrounding the Isle of Muck supported dense *L.hyperborea* forest to 14m depth in places, in turn supporting a wide diversity of invertebrates and algae. Many seaweed samples were taken and pressed for identification and as a helpful record for future studies.

East Shetland, Bressay to Out Stack 26-30 August

Four Observation and 22 Survey forms

A five day trip organised by Paul Holmes on the MV Halton with Seasearch Surveyors and underwater photographers including George Brown, Dr Joanne Porter, Pat Spencer, Rachel Shucksmith and Richard Shucksmith. A total of 12 divers visited sites on the east coast of Shetland from Bressay off Lerwick as far north as Out Stack, the most northerly of the cluster of small islands off the north tip of Unst, including Lunna Ness, Dury Voe, Burra Ness, Basta Voe (Yell) and Hamars Ness (Fetlar). PMFs recorded on the trip included sandy mud with sea pens at Burra Ness, maerl 'dunes' (at Hamars Ness, Fetlar) and sparse *M.modioulus* beds (Dury Voe).

At the Giant's Leg, Bressay, Joanne Porter recorded very diverse short animal turf with many different types of nudibranch. Abundant flatfish (plaice *Pleuronectes platessa* and flounder *Platichthys flesus*) and the attractive nudibranch *Cuthona*

caerulea were respectively recorded by Nigel Topham and Pat Spencer at the wreck of the Froach Ban, off Bressay. Steep rock walls with jewel anemones (*C. viridis*) and dead men's fingers (*A. digitatum*), but a lack of nudibranchs thought due to frequent wave surge, were recorded by Pat at west Herma Ness, Isle of Unst whilst Richard Yorke recorded dense bryozoan and ascidian animal turf here.

On the seabed beneath the wreck of the E-49 U-boat, many molgulid ascidians were recorded by Joanne growing in the troughs of shell sand. With Paul Holmes and Richard Shucksmith, Joanne also recorded many *Virgularia mirabilis* sea pens (estimated at approximately 20 per square metre), the annelid worm *Chone infundibuliformis* and occasional ocean quahog (*Arctica islandica*) at Basta Voe, east Yell. At Hamars Ness, west Fetlar Joanne recorded waves of maerl, where troughs were filled with live maerl and large broken shell fragments and there was evidence of infauna such as razor clams (*Ensis* spp). Richard Shucksmith described the maerl as being in 'dunes' with patches living and dead, and Pat described the maerl at the same site as 'smashed' and 'broken'. Of considerable note, Guillet's goby (*Lebetus guilleti*) was recorded on the maerl here, thought to be the most northerly record.



Guillet's goby (*Lebetus guilleti*) on maerl at Hamar's Ness, west Fetlar, Shetland (RS)

Swarta Skerry was covered in kelp (*L. hyperborea*) and the Yarrell's Blenny (*Chirolophis ascanii*) and the hydroid *H. catharina* were recorded here. Live horsemussels (*M. modiolus*), a PMF, mixed with broken shell and patches of shell sand between and the chameleon prawn *Hippolyte varians* were recorded at Dury Voe. Abundant keelworms (*Spirobranchus triqueter*), indicating a large degree of scour and exposure, were noted on vertical surfaces at Hoo Stack, east mainland Shetland, where Scinà's weed (*Scinaia* spp) and small-spotted catshark (*Scyliorhinus canicula*) were also recorded.



Eubranchus farrani nudibranch, Shetland (RS)

3 Other sources of Seasearch data

Trail Island, West of Little Cumbrae 25 August
One Observation form

Led by Seasearch diver Katherine Dunlop, these Glasgow University SAC divers recorded an unusually large number of dead edible crabs (*Cancer pagurus*).

Loch Long 30 September to 27 October
Two Observation and two Survey forms

Observation forms were independently submitted by Nathan Jeffery, recording a *Modiolus* bed with more shell remains than live shells and litter including bright orange traffic cones, two sweet wrappers, a glass bottle and rope, and Laura Walton from the A-frames at Finnart, sight of the Seasearch Observation qualifying diving on 9 September that both also attended.

Seasearch Surveyor Wendy Northway, who also submitted forms from Loch Fyne in April, returned two Survey forms from 29 steps, north of Finnart oil terminal on the east coast of the sea loch, and from Conger alley, a popular Loch Long shore dive on the northwest coast of the loch. Many keelworms (*Spirobranchus triqueter*) were recorded encrusting various substrates at 29 steps where *M.modiolus*, the rock goby (*Gobius paganellus*) and a lot of debris, including a metal platform, broken bottles, traffic cone and tyres, were also recorded. Among species recorded by Wendy at Conger alley were the common dragonet (*Callionymus lyra*) and leopard-spotted goby (*Thorogobius ephippiatus*).

Loch Fyne 6 April to 10 June
Three Observation and four Survey forms

On 6, 10 and 11 April, Seasearch Surveyor Wendy Northway dived Pennymore Point, recording 26 taxa; St Catherines Reef, noting many chitons on the rock and several crustaceans (*Carcinus maenas*, *Hyas araneus*, *Pagurus* spp and porcelain crabs); Drishaig Bay where many small sea loch anemones (*P.simplex*) and small spotted catshark (*Scyliorhinus canicula*) were recorded and Cairndow View, Loch Fyne, where fireworks anemone PMFs (*P.multiplicatus*) were recorded.

Glasgow based divers, including Seasearch diver Frank Melvin, dived from the east shore of Loch Fyne on 3 and 10 June. A highland dancer (*Pleurobranchus membranaceus*) and a feeding porpoise (*Phocoena phocoena*) were recorded at Glas Eilean, Port Ann and a large shoal of mackerel (*Scomber scombrus*) at the Ledges, south of Strachur.

Loch Crinan 2-4 June
Two Observation forms

Anne Morrison recorded the PMF Celtic featherstars (*L.celtica*), sea hares (*Aplysia punctata*) and common sea pens (*Virgularia mirabilis*) off Rabbit Island, and a crawfish (*Palinurus elephas*), another PMF, at Ardnoe Point at the southwest tip of Loch Crinan.

Firth of Lorn 6-8 October
Five Survey forms

These forms were submitted by Seasearch Surveyor Nicola Faulks from the Firth of Lorn and included a record of pink sea fingers (*Alcyonium hibernicum*) from Steps reef, Garvellachs and new recruitment of jewel anemones (*C.viridis*) and red sea fingers (*A.glomeratum*) at Jeannies reef, perhaps due to a decline in siltation resulting from the scallop dredging closure since March 2007.

Sound of Mull and Ardmucknish Bay 13-15 April
Three Observation forms and one Survey form

On a dive trip that also included wrecks off the Isle of Coll and northwest Isle of Mull (see below), Georgia Conolly completed Seasearch Observation forms for the SS Hispania, recording small patches of jewell anemones (*C.viridis*) and fishing line and rope on the wreck; the SS Rondo, recording many peacock worms (*S.pavonina*) and rare Celtic featherstar (*L.celtica*) and fishing line; Tobermory Harbour, recording two species of sea pen (*V.mirabilis* and the PMF species *Funiculina quadrangularis*), scallops (*P.maximus*) and the Scottish langoustine (*Nephrops norvegicus*) and; the wreck of the Breda in Ardmucknish Bay, recording abundant plumose anemones (*M.senile*), very large grey sea slug (*Aeolidia papillosa*), and again two species of sea pen (*V.mirabilis* and the PMF species *F.quadrangularis*) on the surrounding seabed, and fishing line, nets and creels littering the wreck.

Isle of Coll 14 April 2012
Two Observation forms

Two Observation forms were submitted from Georgia Conolly on a dive trip that also encompassed the Sound of Mull, north Isle of Mull and Ardmucknish Bay. On the wreck of the MV Tapti, jewell anemones (*C.viridis*), many sea cucumbers (*H.forskali*), cup corals (*C.smithii*), large pollock (*P.pollachius*) and conger eel (*Conger conger*) were recorded as well as some maerl by the wreck. On the wreck of the General Consul Elisseejeff, scallops and hermit crabs (*Pagarus prideux*) with cloak anemones (*Adamsia carciniopados*) were recorded.

South Uist 10 to 12 September
Four Observation forms

These Seasearch Observation forms were submitted from Hubert Desgranges from a dive trip that also included the Isle of North Uist. At Ushenish lighthouse, cup corals (*C.smithii*) and the PMF northern seafan (*S.pallida*) were recorded; at Glas-Eileanan, Loch Carnan, curled octopus (*Eledone cirrhosa*) was recorded; very clean maerl and sand were recorded south of Hairteamul, at east end of Sound of Eriskay; and on the SS Politician in the Sound of Eriskay, of course made famous in the book 'Whisky Galore' by Compton McKenzie, kelp and plumose anemones (*M.senile*) were recorded.

North Uist 9 to 11 September
Four Observation forms

These Seasearch Observation forms were submitted from Hubert Desgranges from a dive trip that also included the Isle of South Uist. Within the fjardic sea loch of Loch nam Madadh (Loch Maddy) on the south shore near Eilean Iain Beag, king scallops (*P.maximus*) and kelp (*Laminaria* spp) and other algae were recorded on the wreck of the Burnside. On the north side of the entrance to the loch at Weaver's Point,

heavy silting was recorded as well as cup corals (*C.smithii*), king scallop (*P.maximus*) and hermit crabs (*P.prideaux*) with cloak anemones (*A.carciniopados*). At Modah Mor to the south of the entrance to the loch, the PMF northern seafan (*Swiftia pallida*) was recorded, along with the sponge *Dysidea fragilis* and the nudibranch *Acanthodoris pilosa*. Further south on the open east coast of the Isle of North Uist, south of Modah Granmach, *S.pallida* was again recorded.

Isle of Skye 11 May to 1 December 2012
Nine Observation and three Survey forms

These forms were submitted from divers on various trips: Georgia Conolly (five Observation forms), Martin Findlow (two Observation forms) and Inverness Sub-Aqua Club members Richard Guest (one Survey form), Neil MacInnes (two Survey forms) and Judy Revell (two Observation).

On 11 May, Martin recorded abundant soft corals (*A.digitatum*) and a lump sucker (*Cyclopterus lumpus*) on the wreck of the HMS Port Napier. Also in May, Georgia recorded a large amount of broken shell and maerl at Sgeir nam Biast, possibly arising from trawler damage. Georgia returned to Loch Bay in September, recording ocean quahog (*Arctica islandica*), ling (*M.molva*), abundant scallops (*P.maximus*) and the nudibranch *Onchidoris muricata* at Clett Island; and, at Sgeir a Chuain, many scallops, some maerl, the brown seaweed *Dictyosiphon foeniculaceus*, and the sandy creeplet anemone (*Epizoanthus couchii*). When diving Loch Bay pinnacle by day, Georgia recorded enormous shoals of poor cod (*T.minutus*) and, by night, recorded the kelp covered in many thousands of featherstars (*A.bifida*), the latter providing possible evidence of a nocturnal migration up the reef to the kelp, perhaps when fewer predators are at large. The PMF tall sea pen (*F.quadrangularis*), the football seasquirt (*D.violacea*) and the sponges *Polymastia penicillus* and *P.boletiformis* were also recorded at Loch Bay pinnacle.

At Ord, Sleat on 1 and 2 December, Richard Guest recorded a gentle sand slope bounded by a rocky ridge on the south side and a tiny rock islet to the west on a Survey form. Neil MacInnes and Judy Revell recorded seagrass (*Z.marina*) and dead maerl here on Survey and Observation forms respectively.

Outer Loch Broom and Summer Isles 11-12 August
Two Survey forms

At the north side of Isle Martin, outer Loch Broom, an upper slope of boulders with kelp forest (*Laminaria* spp) descends to a sandy slope and thence to a lower boulder slope where crustaceans (*C.pagurus*, *H.gammarus* and *M.rugosa*), wrasse (*L.bergylta* and *L.mixtus*), echinoderms (*A.rubens*, *E.esculanta*, *M.glacialis* and *Porania pulvillus*) and other life are recorded. At the west side of Glas-Leac Mor, Summer Isles, Richard recorded a rocky reef with boulders and sand pockets, with kelp forest at top and a total of 23 species, including cushion star (*P.pulvillus*) and blue-rayed limpets (*Helcion pellucidum*).

Loch Eriboll 13-16 July
Two Survey forms

Two Survey forms were submitted by Seasearch Surveyor Thomas Kerr from dives in Loch Eriboll. At An Dubh-Sgeir, 34 species were recorded on near vertical pitted limestone walls with gullies and at least one cave was recorded. At Tor na Bithe,

vertical rock walls gave way to boulder slope, descending in steps to steeply sloping coarse sand seabed. Two ling (*M. molva*) were also recorded.

Scapa Flow, Orkney 7 May to 20 September
14 Observation forms

A range of Observation forms were submitted from Scapa Flow throughout the year from a number of independent sources.

Between 7 and 11 May, Natalie Hirst completed seven Seasearch Observation forms from wrecks of the SMS Brummer, SMS Dresden, SMS Karlsruhe and SMS Köln, and the seabed on which the wrecks lay. Of interest were the seamouse (*Aphrodita aculeata*) recorded on the seabed by the SMS Dresden; the Pullet carpet shell (*Venerupis senegalensis*) recorded on the seabed by SMS Brummer and SMS Karlsruhe (a widespread species but not often recorded as buried in sediment); *M.modiolus* recorded by the SMS Brummer, SMS Köln and SMS Karlsruhe. Later in May, Seasearch Observer diver and snorkeler Anne Bignall submitted two Observation forms from the second Churchill Barrier by Glimps Holm, one recording paddleworm (Phyllodoceidae) egg masses and the other abundant sea hares (*A.punctata*).

On 20 and 22 June, Allison Gleadhill completed Seasearch Observation forms for Scapa Flow wrecks, recording, among other species, the bryozoans *Alcyonidium hirsutum* and *Securiflustra securifrons* and the coral worm *Salmacina dysteri* on the Gobernador Bories and dense filter-feeding life on the Tabarka, including the sponges *Leucosolenia* and *Pachymatisma johnstonia*, hydroids (*Tubularia indivisa* and *T.larynx*), soft corals (*A.digitatum*), plumose anemones (*M.senile*) and the coral worm *S.dysteri*.

On 26 July, Jenni Kakkonen completed a Seasearch Observation form for the third barrier at Scapa Flow recording red and green seaweed, sea lemon (*Archidoris pseudoargus*) and sea hare (*A.punctata*) among other species. On 16 August Jenni recorded a large shoal of saithe (*Pollachius virens*) at the top of Nevi Skerry, near the island of Flotta. On 20 September, Kevin Jones completed an Observation form for SMS Syedlitz.

North Orkney 7 July to 9 September
Six Observation forms

Seasearch diver Matthew Newsome completed three Observation forms as part of an extensive dive trip that concentrated mainly on Shetland (see below). In Orkney, Eday Pier was dived, descending to sand and gravel where dragonet (*Callionymus lyra*) was recorded. At the wreck of the Loch Garry, a seabed completely covered in shells of razorshell, limpet and mussel shells was recorded. The wreck itself provided a substrate for *A.digitatum*. At the wreck of the Endeavour, cup corals (*C.smithii*), soft corals (*A.digitatum*) and featherstars (*A.bifida*) were recorded. On the final day of the Orkney and Shetland trip, most of which was spent around Shetland, the SS Oceana sitting on sand and gravel in Mill Bay, Orkney was dived where kelp, cup corals (*C.smithii*), pollock and a conger eel (*C.conger*) were recorded.

Seasearch Observer Jenni Kakkonen submitted a Seasearch Observation form for Tingwall pier where the PMFs maerl and seagrass (*Z.marina*) were recorded. Seasearch Observer Anne Bignall also recorded *Zostera* beds at Halley, Deerness off the north Orkney mainland coast.

Shetland 8-19 July
13 Observation forms

Seasearch diver Matthew Newsome completed an impressive 13 Observation forms on dives literally spanning the length and breadth of the Shetland Isles, from Fair Isle in the south to Out Stack in the North, Bressay in the east to Foula in the west. At Vaila *Cyanea* jellyfish were recorded above the kelp forest; at Sheep rock, east Fair Isle, rocky reef and boulders with *Laminaria* kelp and a harbour porpoise (*Phocoena phocoena*); at the wreck of Gwladmena, Bressay Sound, sea toad (*Hyas araneus*) and spiny squat lobster (*Galathea strigosa*); at Lunokhods, Bressay Lighthouse, a tadpole fish (*Raniceps raninus*); at Pionersk, Gulber Wick, south of Lerwick, lobster (*Homarus gammarus*) and Ballan wrasse (*Labrus bergylta*); at Giant's Leg, Southern Bressay kelp and cup corals; on the seabed beneath the SS Jane, between Yell and Fetlar, maerl was recorded; at HMS E-49, East Unst, a tub gurnard (*Trigla lucerna*); at Out Stack, Muckle Flugga, Unst, boulders were recorded covered in life (including *C.viridis*, *Urticina felina* and the sponge *Pachymatisma johnstonia*); northeast of Ve Skerries, rocky reef, large boulders, sand and gravel with kelp park were recorded; extremely dense *Laminaria* forest, soft corals, edible crab (*C.pagurus*) and small-spotted catshark (was recorded growing on RMS Oceanic, East of Foula; and on the wreck of the Braer oil tanker which ran aground off southwest Shetland, kelp, sponge, saithe (*P.virens*) and sea hare (*Aplysia punctata*) were recorded.

St Abbs 24 April to 1 October
17 Observation and seven Survey forms

St Abbs is a popular diving destination for divers in the southeast of Scotland and, even more predominantly, the north of England. Regularly recorded sites such as Anemone Gullies, Black Carr and Skelly's Hole again feature in 2012. The forms were submitted from a range of sources in 2012 including the St Abbs and Eyemouth Voluntary Marine Reserve Ranger Georgia Conolly (four Survey forms) and from various visiting Seasearch divers from London, Bristol, Harrogate, Bury St Edmonds and Ipswich. Allison Gleadhill submitted three Survey forms from Skelly Hole, Anemone gullies and Black Carr.



The nudibranch *Flabelline pedata* at Skelly pinnacle, St Abbs Head (JA)

Georgia Conolly recorded heavily urchin-grazed boulders at White Heugh and hydroids (*Tubularia indivisa*), bryozoans (*Bugula flabellata* and *Flustra foliacea*), soft corals (*A. digitatum*) and many large fish species (*Anarhichas lupus*, *C. conger*, *Gadhus morhua*, *M. molva*, *P. Pollachius*) on the wreck of the Glanmire. During the Nudibranch identification course run by Jim Anderson at St Abbs, Georgia recorded a sandy gully with occasional large boulders flanked on either side by steep rocky reefs and many sea hare (*A.punctata*) at Skelly Hole and the rarely recorded nudibranch *Janolus*

hyalinus at Skelly Pinnacle, rising 10m above the surrounding boulder-dominated seabed. In fact, a hugely impressive total of 22 nudibranch species were recorded by all participants at Skelly Pinnacle during the course: *Acanthodoris pilosa*, *Aeolidiella glauca*, *Aeolidia papillosa*, *Archidoris pseudoargus*, *Coryphella lineata*, *Diaphorodoris*

luteocincta, *Doto coronata*, *Eubranchus pallidus*, *Favorinus blianus*, *Facelina auriculata*, *Facelina bostoniensis*, *Flabellina pedata*, *Goniodoris nodosa*, *Janolus cristatus*, *Janolus hyalinus*, *Limacia clavigera*, *Onchidoris bilamellata*, *Polycera faeroensis*, *Polycera quadrilineata*, *Tritonia hombergii* and *Tritonia plebeia*.



The grey nudibranch *Aeolidia papillosa* at Skelly pinnacle, St Abbs Head (JA)

Rod Sterland recorded many brittlestars (*Ophiothrix fragilis* and *Ophiocolina nigra*) at Anemone gullies. On the wreck of the Alfred Erlandsen in shallow water on the Ebb Carrs, Graham Jackson recorded well-grazed oaten-pipe hydroids (*Tubularia* spp) and, with Glenn King, poor visibility and silting possibly owing to recent storms. Graham also recorded well-grazed *Tubularia* at Black Carr.



Several *Onchidoris bilamellata* nudibranchs at Skelly pinnacle, St Abbs Head (JA)

One dive in St Abbs harbour itself, a rare opportunity, revealed perhaps unsurprisingly many discarded crab claws and scallop shells, whilst another dive to the east of the harbour wall recorded discarded litter.

Eyemouth 19-23 September

One Observation and Five Survey forms

These forms were submitted by Charlotte Bolton (Seasearch Northeast England), Georgia Conolly (St Abbs and Eyemouth Voluntary Marine Reserve Ranger), Allison Gleadhill, Steve Mustow, Ruth Sharratt and Dawn Watson (Seasearch East England). Diving out of Eyemouth is popular among divers from Southeast Scotland and Northeast England and Conger Reef is one of several sites frequently returned to. Of note, on 23 September Dawn Watson recorded a Norwegian topknot (*Phrynorhombus norvegicus*), the colourful nudibranch *Cuthona caerulea* and a gravel seabed that had some evidence of recent trawling. At the same site that day, Georgia recorded large sand waves and lots of empty and broken scallop shells but no live specimens and, on the rock itself, Charlotte recorded many *Tritonia hombergii* nudibranchs and brittlestars on soft corals (*A. digitatum*) and Steve recorded many juvenile *T. hombergii*, the Arctic deeplet anemone *Bolocera tuediae* (the only record of this northerly species in 2012), cup corals (*C. smithii*), featherstars (*A. bifida*) and a lemon sole (*Microstomus kitt*).

4 Miscellaneous individual Seasearch records 5 May to 27 September

FM Rock, Loch Fyne 16 September

One Observation form

A record of this well known dive site in Loch Fyne with a strange conglomerate rock reported at the base of the cliff. An interesting mix of typical sea loch species (such as *A. aspersa*, *A. mentula*, *M. rugosa*, *P. simplex* and *S. pavonina*) with sponges associated with deeper (*Axinella infundibuliformis*) or more exposed reefs (*P. johnstonia*).

Creagan Inn Bay slipway, Loch Creran 5 May

One Observation form

MCS Northwest England co-founder and Seasearch diving stalwart, Ron Crosby recorded a rocky reef with kelp forest and mixed algae descending onto coarse sand and pebbles and a total of 30 species, including the burrowing sea cucumber (*Neopentadactyla mixta*) and the PMF horse mussel (*M. modiolus*). Bottles and drinks cans were also recorded.

SS Aurania, Isle of Mull 13 April

One Observation form

On a trip that also included Isle of Coll and Sound of Mull, Georgia Conolly completed a Seasearch Observation form for the wreck of the ocean liner SS Aurania on the northwest coast of the Isle of Mull. Many sea cucumbers buried in crevices (*Pawsonia saxicola*) and gravel (*N. mixta*) were recorded.

Northeast tip of Colonsay, 29 August

One Observation form

The father and son team of Frank and Steven Melvin took advantage of a rare spell of good weather to dive this remote spot and recorded a wide diversity of indeterminate red algae. The following brown seaweeds were identified to species level: *Halidrys siliquosa*, *Himanthalia elongata* and *Laminaria hyperborea*.

Inverinate slip, Loch Duich 27 September

One Observation form

Georgia Conolly recorded a sandy mud seabed with some pebbles, all three species of seapen (*F. quadrangularis*, *Pennatula phosphorea* and *V. mirabilis*), Scottish langoustine (*N. norvegicus*), queen scallops (*A. opercularis*) and the PMFs *M. modiolus* and ling (*M. molva*). Several of the sea pens were bent or broken, possibly as a result of damage from bottom towed fishing gear.

Papigoe, Broadhaven, Wick 5 June

One Survey form

Seasearch Surveyor Thomas Kerr recorded a narrow, steep-sided gully, with a lobster creel and some metal debris, and a lumpsucker (*C. lumpus*) in the kelp forest.

HMS Ludlow wreck, Broad Sands, near North Berwick, East Lothian 24 July

One Survey form

Thomas Kerr recorded the broken up wreck of HMS Ludlow on firm sand with broken shells in shallow water. Vertical surfaces supported a surprising amount of sessile life given the shallow sandy conditions, particularly the soft coral *A. digitatum*. A lot of rope was recorded entangled on the wreck.

APPENDIX A

Full list of species, genera and families recorded during Seasearch in Scotland 2012

Bacteria	Plantae	Algae	Porifera	Cnidaria	Ctenophora	Nemertea	Annelida	Chelicerata	Crustacea	Mollusca	Brachiopoda	Bryozoa	Echinodermata	Tunicata	Fish	Birds	Mammals
Beggiatoa	Zostera marina	Acrosorium venulosum Alaria esculenta Ascophyllum nodosum Bonnemaisonia asparagoides Bonnemaisonia hamifera Brongniartella byssoides Bryopsis plumosa Calliopharis ciliata Callophyllis laciniata Ceramium Chondrus crispus Chorda filum Chordaria flagelliformis Cleidophora rostris Codium fragile Corallina officinalis Cryopteris ramosa Delesseria sanguinea Derbesia marina Desmarestia aculeata Desmarestia liquata Desmarestia vridis Diatoms - film Dictyosiphon fenestratus Dictyota dichotoma Dilsea carnosia Drachella heterocarpa Drachella spectabilis encrusting algae indet. Ectenomorpha intestinalis Filamentous red algae Fucus serratus Fucus vesiculosus Gelidium Halidrys siliculosus Heterosiphonia plumosa Himantalia elongata Kalymenia rotiformis Laminaria digitata Laminaria	Amphilectus lucorum Aplysilla sulfurea Axinella dissimilis Axinella infundibuliformis Clathrina coriacea Clypeaster Crelia Dysidea fragilis Guanchea lacunosa Halichondria parvica Halictona ureocelus Halictona viscosa Hemimyscale columella Hymedesmia paupertas Iophon hydmani Myxilla incrustans Leucosolenia Mycale Myxilla Olytia hemisphaerica Pachymatisma johnstonia Phakellia ventriferum Polymastia boletiformis Polymastia penicillus Porifera indet. crusts Porifera indet. Raspailia ramosa Scypha ciliata Suberites carnosus Suberites ficus Funiculina quadrangularis Tethya citrina	Abietinaria abietina Actinia equina Adamsia carcinopados Aglaophenia pluma Alcyonium digitatum Alcyonium glomeratum Alcyonia hibernicum Amphibesia operculata Anemonia viridis Antennella varians Aurelia aurita Aurelia heterocera Caryophyllia smithii Cereus decoratus Ceranthus lloydii Clytia hemisphaerica Corynactis viridis Convolutus Cyanea capillata Cyanea lamarkii Diphasia pinaster Diphasia rosacea Dynamena pumila Edwardsia clarepedii Edwardsiella carnea Epizoanthus couchii Funiculina quadrangularis Garveia nutans Gonactinia prolifera Halocampa chrysanthellum Halocampium beanii Halocampium halecinum Halocampium muricatum Halocampium plumosum Halocystus Halopteris catharina Hormathia coronata	Beroe cucumis Pleurobrachia pileus Chaetopterus variopectatus Chone infundibuliformis Carcinus maenas Elysia viridis Eulalia viridis Eupolyrnia nebulosa Filograna implexa Hydroids Lancea conchilega Myxocola infundibulum Polydora ciliata Pomatoceros triquetter Inachus Sabella pavonina Salmacina dysteri Serpula vermicularis Spirorbis Terebella Mysidae Necora puber Nephrops norvegicus Pagurus bernhardus Pagurus cuanensis Pagurus prideaux Palaeomon serratus Pandalus montagui Pardalipoda longicornis Polydora rotundus Scalpellum scalpellum Scalpellum Halicystus Halopteris catharina Hormathia coronata	Ctenophora Nemertea Annelida Chelicerata Crustacea Mollusca Brachiopoda Bryozoa Echinodermata Tunicata Fish Birds Mammals	Pycnogonida Astacella longicornis Acanthodoris pilosa Neorania anomala Aetea Amphipholis squamata Apidium nordmanni Apidium punctum Arctedon bifida Arctedon petasus Ascidia conchilega Ascidia mentula Ascidia virginea Asterias rubens Asterina gibbosa Astropecten irregularis Crossaster paucispinus Echinocardium cordatum Echinus esculentus Henricia Callepora pumicosa Celleporella lyalina Celleporella hassallii Cribrella annulata Crisia aculeata Crisia eburnea Crisidia cornuta Dendrobaena Ophiactis balli Ophiocoma nigra Ophiopholis aculeata Ophiopsila aranea Ophiothrix fragilis Ophiura albida Pawsonia saxicola Hippothoa flagellum Idmirona atlantica Membranipora membranacea Onaissecosa ramulosa Palmskenea skenei Parasmittina trispinosa Platygocia patina Porella compressa Puelinia inornata Schizomavella linearis Scruparia Scrupocellaria reglans Scrupocellaria scruposa Securiflustra	Agonus cataphractus Ammodytes lobianus Anarhichas lupus Buenia jeffreysii Callionymus lyra Callionymus reticulatus Centrolophus exoletus Chirolophus ascanii Ciliata mustela Conger conger Crenilabrus melops Ctenolabrus rupestris Cyclopterus lumpus Eutrigla gurnardus Gadus morhua Gobius paganellus Gobiusculus flavescens Labrus bergylla Labrus mixtus Lebetus guilleli Limanda limanda Liparis Lipophys pholis Metanogrammus aeglefinus Microstomus kitt Molva molva Myxocopthalmus scottus Parablennius ruber Pholis gunnellus Phrynothombus norvegicus Platichthys flesus Pleuronectes platessa Pollachius pollachius Pollachius virens Pomatoschistus pictus Pilotia gunneri Raja clavata Raniceps raninus Scomber scombrus Scyliorhinus									

		<i>hyperborea</i>										<i>securifrons</i>					<i>cancula</i>		
		<i>Laminaria saccharina</i>		<i>Hyas araneus</i>								<i>Facelina annulicornis</i>	<i>Tubulopora</i>				<i>Spinachia spinachia</i>		
		<i>Leatheia difformis</i>		<i>Hydractinia echinata</i>								<i>Facelina auriculata</i>	<i>Vesicularia spinosa</i>				<i>Syngnathus acus</i>		
		<i>Lithothamnion glaciale</i>		<i>Hydrilmania falcata</i>								<i>Facelina bostoniensis</i>					<i>Taurulus bubalis</i>		
		<i>Lomentaria articulata</i>		<i>Kirchenpaueria pinnata</i>								<i>Favorinus bianus</i>					<i>Thorogobius ephippiatus</i>		
		<i>Lomentaria orcadensis</i>		<i>Metridium senile</i>								<i>Favorinus branchialis</i>					<i>Trigla lucerna</i>		
		<i>Maerl indet</i>		<i>Mitrocomella polydiademata</i>								<i>Flabellina pedata</i>					<i>Trisopterus luscus</i>		
		<i>Membranoptera alata</i>		<i>Muggiaea</i>								<i>Gibbula cineraria</i>					<i>Trisopterus minutus</i>		
		<i>Nitophyllum punctatum</i>		<i>Nemertesia antennina</i>								<i>Gibbula magus</i>					<i>Zeugopterus punctatus</i>		
		<i>Odonthalia dentata</i>		<i>Nemertesia ramosa</i>								<i>Goniodoris castanea</i>					<i>Zoarces viviparus</i>		
		<i>Osmundea pinnatifida</i>		<i>Neoturris pileata</i>								<i>Goniodoris nodosa</i>							
		<i>Palmaria palmata</i>		<i>Obelia geniculata</i>								<i>Helcion pellucidum</i>							
		<i>Phycodrys rubens</i>		<i>Pachycerianthus multiplicatus</i>								<i>Hinia reticulata</i>							
		<i>Pocamium cartilagineum</i>		<i>Parazoanthus anguicomus</i>								<i>Janolus cristatus</i>							
		<i>Plumularia setacea</i>		<i>Parazoanthus axinellae</i>								<i>Janolus hyalinus</i>							
		<i>Polysiphonia</i>		<i>Peachia cylindrica</i>								<i>Jorunna tomentosa</i>							
		<i>Rhodophyllis divaricata</i>		<i>Pennatula phosphorea</i>								<i>Lacuna vineta</i>							
		<i>Saccharina latissima</i>		<i>Phellia gausapata</i>								<i>Limacia clavigera</i>							
		<i>Saccorhiza polyschides</i>		<i>Prothantha simplex</i>								<i>Limaria lians</i>							
		<i>Sargassum muticum</i>		<i>Sagartia elegans</i>								<i>Littorina littorea</i>							
		<i>Scrinia</i>		<i>Sagartia troglodytes</i>								<i>Littorina obtusata</i>							
		<i>Ulva lactuca</i>		<i>Sagartiogeton laceratus</i>								<i>Modiolus modiolus</i>							
				<i>Sagartiogeton undatus</i>								<i>Mya truncata</i>							
				<i>Sarsia eximia</i>								<i>Mytilus edulis</i>							
				<i>Schizotricha</i>								<i>Natica</i>							
				<i>Sertularella gaudichaudi</i>								<i>Nucella lapillus</i>							
				<i>Sertularella gayi</i>								<i>Onchidoris bilamellata</i>							
				<i>Sertularella polyzonis</i>								<i>Onchidoris muricata</i>							
				<i>Sertularella rugosa</i>								<i>Onchidoris pusilla</i>							
				<i>Sertularia argentea</i>								<i>Ophiolamia fragillissima</i>							
				<i>Siphonophora</i>								<i>Patella vulgata</i>							
				<i>Swiftia pallida</i>								<i>Pecten maximus</i>							
				<i>Thuidaria thuja</i>								<i>Philine aperta</i>							
				<i>Tubularia indivisa</i>								<i>Pleurobranchius membranaceus</i>							
				<i>Tubularia larynx</i>								<i>Polycera faeroensis</i>							
				<i>Urticina eques</i>								<i>Polycera quadrilineata</i>							
				<i>Urticina felina</i>								<i>Rostanga rubra</i>							
				<i>Virgularia mirabilis</i>								<i>Sepiella atlantica</i>							
												<i>Simnia patula</i>							
												<i>Tectura testudinalis</i>							
												<i>Tectura virginea</i>							
												<i>Tarpea senegalensis</i>							
												<i>Trapania pallida</i>							
												<i>Tritonia hombergii</i>							
												<i>Tritonia lineata</i>							
												<i>Tritonia plebeia</i>							
												<i>Trivia arctica</i>							
												<i>Trivia monacha</i>							
												<i>Turritella communis</i>							
												<i>Venerupis senegalensis</i>							
1	1	61	31	77	2	1	20	1	32	89	1	42	32	29	49	1	2		
472																			

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Text by: Calum Duncan with contributions from Bob Anderson, Angela Gall, Owen Paisley and Dr Joanne Porter

Photo credits: Bob Anderson (BA), Jim Anderson (JA), Sally Campbell (SC), Calum Duncan (CD), Angela Gall (AG), Gordon Lang (GL), Dr Joanne Porter (JP), Rachel Shucksmith (RS) and Dawn Watson (DW)

Seasearch is a volunteer underwater survey project for recreational divers who wish to contribute to conserving the marine environment.

Seasearch is co-ordinated by the Marine Conservation Society on behalf of the Seasearch Steering Group which comprises the Marine Conservation Society, The Wildlife Trusts, Joint Nature Conservation Committee, Natural England, Countryside Council for Wales, Scottish Natural Heritage, Environment and Heritage Service Northern Ireland, Environment Agency, Marine Biological Association, Nautical Archaeological Society, British Sub Aqua Club, Sub Aqua Association, Professional Association of Diving Instructors, Scottish Sub Aqua Club, Irish Underwater Council and independent marine life experts.

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Seasearch divers departing to survey South Arran pMPA (SC)

dive into conservation