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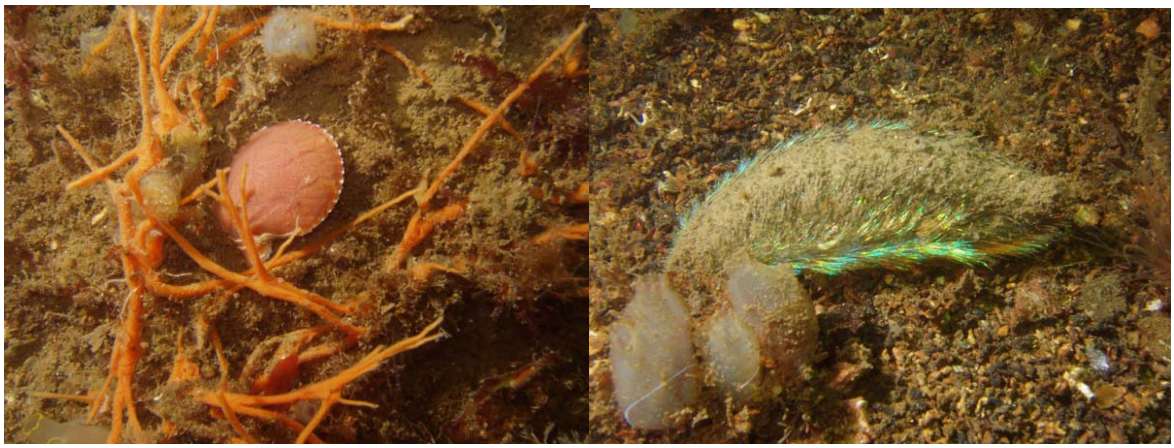
LAMLASH BAY SEASEARCH 2003

REPORT

CALUM DUNCAN

DECEMBER 2003

INTERIM REPORT BY THE MARINE CONSERVATION SOCIETY TO SCOTTISH NATURAL HERITAGE



SCOTTISH NATURAL HERITAGE

MARINE CONSERVATION SOCIETY

ARRAN SEASEARCH 2003

Interim Report to SCOTTISH NATURAL HERITAGE

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CONTENTS

SYNOPSIS

Seasearch is a programme of Phase I marine biological survey, developed by the Marine Conservation Society (MCS) and the Joint Nature Conservation Committee (JNCC), designed to give sports divers an opportunity to participate in marine biological surveys, and to contribute to the information from an area by recording habitats and species.

As part of the remit of the Marine Conservation Society Conservation Officer for Scotland, 8 diving members of the Community of Arran Seabed Trust (COAST) were trained to Seasearch Observer level at a course in Lamlash School on 22 March 2003 (Seasearch Course No. 0302). COAST is a representative local organisation, whose over 230 members are based principally on the Isle of Arran, convened to lobby for establishment of a fisheries 'No-Take Zone' or regeneration area in Lamlash Bay.

No records existed for Lamlash Bay within the Marine Nature Conservation Review database (www.jncc.gov.uk/mermaid), the nearest site, Whiting Bay having been surveyed remotely using box core samples. Since no existing sublittoral records existed for Lamlash Bay, diving COAST participants from the March Seasearch course conducted Seasearch dives throughout the bay during summer 2003 to build a simple sublittoral baseline for the area. Seasearch Observer forms were completed for 21 sites. A simple species list has been compiled and a CD-Rom of photographs exists.

Seabeds of sand, cobble and mixed ground with occasional boulders were the most common seabed types recorded throughout the bay. Kelp was recorded within 8m bsl at all coastal sites. Maerl was recorded from sites throughout the north channel entrance to Lamlash Bay, north of Holy isle, a known but degraded deep maerl bed. Eel grass was recorded from one site midway along the north coast of Lamlash Bay and scallops were recorded as common at several sites. Abundances of scallops, particularly juveniles, were deemed noteworthy by the field recorders at The North Channel Buoy, Fullarton Rock and Deacon Rock. An absence of scallops from sites adjacent to the fish farm was deemed noteworthy due to anecdotal accounts of large numbers there a decade go, prior to establishment of the fish farm.

Of 70 taxa recorded, 36 were recorded to species level and 19 were within the subphylum Pisces, reflecting the greater confidence of the field recorders in identifying fish. In an area with no existing sublittoral records, the survey team, having undertaken Seasearch Observer training, conducted a respectable baseline survey of interesting areas within Lamlash bay.

There exists within Lamlash Bay future scope for research, including:

- baseline Seasearch surveys of other areas of the bay such as the southwest coast of Holy Isle and the coast between Kingscross Point and the fish farm and;
- the potential for more quantitative monitoring of the maerl and seagrass beds, and scallop and flatfish populations, perhaps in collaboration with academic researchers.

It is hoped that this report of COAST Seasearch activity provides:

- a baseline upon which to gather more Seasearch data for inclusion in Marine Recorder;
- a guide to steer potential future quantitative monitoring and;
- a focus for ongoing discussion regarding the Arran Marine Regeneration Trial.

1 INTRODUCTION

1.1 Background to survey

Arran is the largest island in the Firth of Clyde, the most southerly fjord in the Northern Hemisphere (see Figure 1). It is situated to the west of the Firth, separated from the Kintyre peninsula to the west and northwest by the Kilbrennan Sound and from Cowall and Bute to the north and northeast by the Sound of Bute and the mouth of Loch Fyne. The island itself measures 36km along the north-south axis and 22km along the east-west axis and has a population of around 5000.

Due to its diverse scenic landscapes and variety of land-uses, Arran is often known as 'Scotland in Miniature' and is a popular holiday destination for those people particularly interested in outdoor recreation. Many come to climb Goat Fell, Arran's highest peak at 874m, although there is an increasing range of outdoor pursuits to be enjoyed here, from boat trips to quad-biking. The major sources of revenue in Arran are tourism and farming.

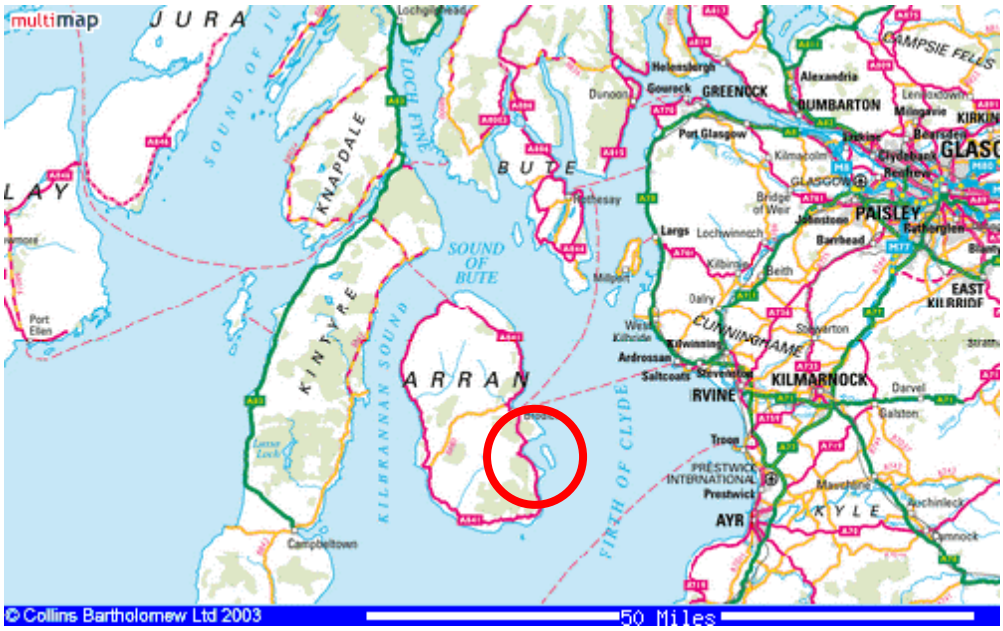


Figure 1 Location of Lamlash Bay within the Firth of Clyde (red circle)

1.2 Lamlash Bay

On the southern east coast of the island of Arran in North Ayrshire, Lamlash Bay is approximately 5km long and bounded by the headlands of Clauchlands Point to the north and Kingscross Point to the south. Situated 3 miles (5km) south of Brodick, the main settlement of the bay is Lamlash (Gazetteer for Scotland, 2003), the second largest settlement on Arran. At its deepest, the bay is marked on Admiralty Charts as 38m bcd and characterised as shell gravel. Rocky coast is present around the northern and southern margins of the bay. The southwestern coast of Holy Island consists of a steep rocky slope that descends to 20m bcd. At the northern and southern entrances to Lamlash Bay, either side of holy isle, shallower sills have formed. The northern sill consists of a deep, though somewhat degraded, maerl bed (COAST 2003).

Lamlash Bay is used by a number of local stakeholders including the Holy Isle ferry operator, the RNLI, the salmon and mussel farms, yachtsmen, boatmen, anglers, divers and practitioners of other leisure activities. To the east of Lamlash Bay lies Holy Isle, owned by the Kagyu Samye Ling Tibetan Buddhists, approximately 3km long by 1.5km wide.

1.3 Seasearch

Seasearch is an underwater habitat surveying project for recreational SCUBA divers in the UK, extending to approximately five miles off the coast within depths of about 30 m. With over 16,000 km of coastline in Scotland alone (MLURI, 1993), many areas of our inshore seabed remain largely unsurveyed, particularly in the North East of Scotland and the outer Firth of Clyde, including Arran (JNCC, 2003). Simple but accurate seabed observations recorded by divers can help map the various kinds of habitats and marine life surrounding Scotland. Collation of baseline habitat data from Seasearch volunteers can form the precursor to specialised professional surveys in newly identified areas of interest. Through Seasearch, recreational divers are therefore in an excellent position to make a real contribution to marine conservation.

With a growing baseline of knowledge gathered into a national database it is possible to identify which seabed types are most widespread, where there are unusual or important underwater features, and which species of marine wildlife are rarest or most abundant. Records from frequently visited sites will also help to identify where changes may be occurring. This information is vital in providing a framework for management decisions and conservation activities to protect and enhance our marine environment.

A National Seasearch Steering Group (NSSG) was established in 1999 to develop the potential of the project. The NSSG members include statutory conservation bodies (Scottish Natural Heritage, English Nature, Countryside Council for Wales and Joint Nature Conservation Committee), the Environment Agency, Non-Governmental Organisations (Marine Conservation Society and The Wildlife Trusts), the Marine Biological Association (MarLIN), diver training organisations (BSAC, SSAC, PADI and SAA), the Nautical Archaeology Society and independent marine life experts. The Marine Conservation Society, with the support of Scottish Natural Heritage, has been responsible for coordinating Seasearch activities in Scotland since April 2000. Since then, a number of expeditions, including to Loch Torridon, Loch Goil, Isle of May, Loch Roag and Cape Wrath have been coordinated, and training courses from St Abbs to Shetland run.

During 2002, training materials produced by the Seasearch steering group, including course participant packs, Microsoft PowerPoint presentations and training videos were piloted for both the Seaserch Observer and Surveyor methodologies. A total of 9 pilot Observer and 4 pilot Surveyor courses took place throughout the UK. In November 2002, funding was secured by the Marine Conservation Society from the Heritage Lottery Fund to support a UK Seasearch coordinator. On World Ocean's Day 2003, the full Seasearch programme was officially launched and, at the time of writing, a total of 40 Seasearch Observer courses have been run throughout the UK during 2003, including 6 in Scotland.

1.4 Arran COAST

The Community of Arran Seabed Trust (COAST) is a representative local organisation whose over 230 members are principally based on the Island of Arran. COAST is currently concerned with the establishment of:

- a 'No-Take Zone', excluding mobile gear, static gear and diver-harvesting within an area of Lamlash Bay in which maerl, among other species, has been recorded and;
- a Marine Protected Area, restricting mobile fishing gear throughout the whole of Lamlash Bay but allowing for static gear use and diver collection outside the NTZ.

COAST have broad support for their proposals from the community of Arran, locally based commercial fishermen and also many visitors. The project has also openly consulted with representatives of the mobile and static fishing communities that use Lamlash Bay.

2 PREVIOUS WORK IN THE AREA

A detailed literature review was not thought necessary at this stage of reporting and has not been carried out. However, to the author's knowledge, no previous sublittoral surveying has taken place in Lamlash Bay, at least none that has been entered into the JNCC Mermaid MNCR database (JNCC, 2003).

The University Marine Biological Station Millport did carry out a preliminary assessment of Lamlash Bay as follows:

> *Most of the seabed within Lamlash Bay is composed of soft substrate, including patches of seagrass. However, areas of sublittoral rock, with kelp communities are also present along the northern coast and also adjacent to the northern channel, which reaches about 25m in depth. Most interesting, in the proposed marine regeneration area are the remains of a deep maerl bed, which although it has been extensively damaged by scallop dredging since the 1970's, still contains significant wild maerl. It is apparent that the area posses a range of habitats and has significant potential for regeneration.*

3 METHODS

3.1 Survey facilities

During the summer of 2003, all Seasearch diving that contributed to this report was carried out by COAST diving members at their own expense and using their own facilities in their own time.

3.2 Site selection and position fixing

Sites were selected to cover as much of Lamlash Bay as possible, although the area to the north of Holy Isle provided a particular focus due to local knowledge of maerl distribution and the concomitant goal of COAST to designate it a No-Take Zone. In addition, this area between Holy Isle and Clauchlands Point has been suggested by COAST as a possible No-take Zone (COAST, 2003). Positions were recorded from an Admiralty Chart for most sites and with a hand-held GPS for some others.

3.3 Survey techniques

Divers worked in pairs with the divers descending to the deepest depth of the dive where they then began recording using underwater writing boards. Ascending up the slope in a predetermined direction, usually directly towards the shore, they stopped to record different seabed types, seabed cover types (the life living on or in the seabed) and the most conspicuous species that they were able to identify, noting the depth at which changes occurred.

The information was later transferred to Seasearch Observer forms, requiring details of site location, a sketch of the underwater terrain and some basic information about the types of seabed and plant or animal cover present. It also allows divers to record as many species as they are able, even if only to Genus, Class or Subphylum level. More details of these methods are included in the Seasearch Observer Course participant packs (Seasearch, 2003).

No specimens were collected although underwater photographs were taken by Howard Wood on an Olympus digital camera with waterproof housing.

3.4 Data analysis

Data from the 21 Lamlash Bay Seasearch Observer forms were entered into the Marine Recorder database (license no. MRMCS002: Calum Duncan, MCS Scotland) and then extracted into Microsoft Access using the 'Marine Snapshot' tool (downloaded from www.esdm.co.uk/Marinerecorder/index.html).

Queries on the extracted database were used to compile the following spreadsheets in Microsoft Excel:

- Site information including location, seabed type and seabed cover type;
- Species list.

It should be noted that although depths on the recording forms have not yet been corrected to chart datum, this does not affect the interim points made in this report.

4 RESULTS

Survey forms were completed for 21 sites in Lamlash Bay, from Clauchlands Point in the north to Kingscross Point in the south (see Figure 2).

The main clusters of sites surveyed were:

- to the north of the north channel entrance to Lamlash Bay (sites 3, 5, 7 and 13: **4.3.2**)
- the midst of the north channel entrance to Lamlash Bay (sites 4, 8, 11 and 16: **4.3.3**);
- on the northwest corner of Holy Isle itself (sites 9, 10, 14 and 15: see **4.3.4**);
- around the Salmon farm midway along the southwest coast of the bay (sites 18, 19 and 21: see **4.3.6**) and;
- at Kingscross point at the south entrance to the bay (sites 17 and 20: see **4.3.7**).

Dives were also conducted at sites midway along the northeast coast of the bay (sites 1 and 2: see **4.3.1**), midway down the west coast of Holy Isle (site 12) and at Deacon Rock off the northwest of Holy Isle (site 6: see **4.3.5**). See Appendix 2 for details of sites surveyed.

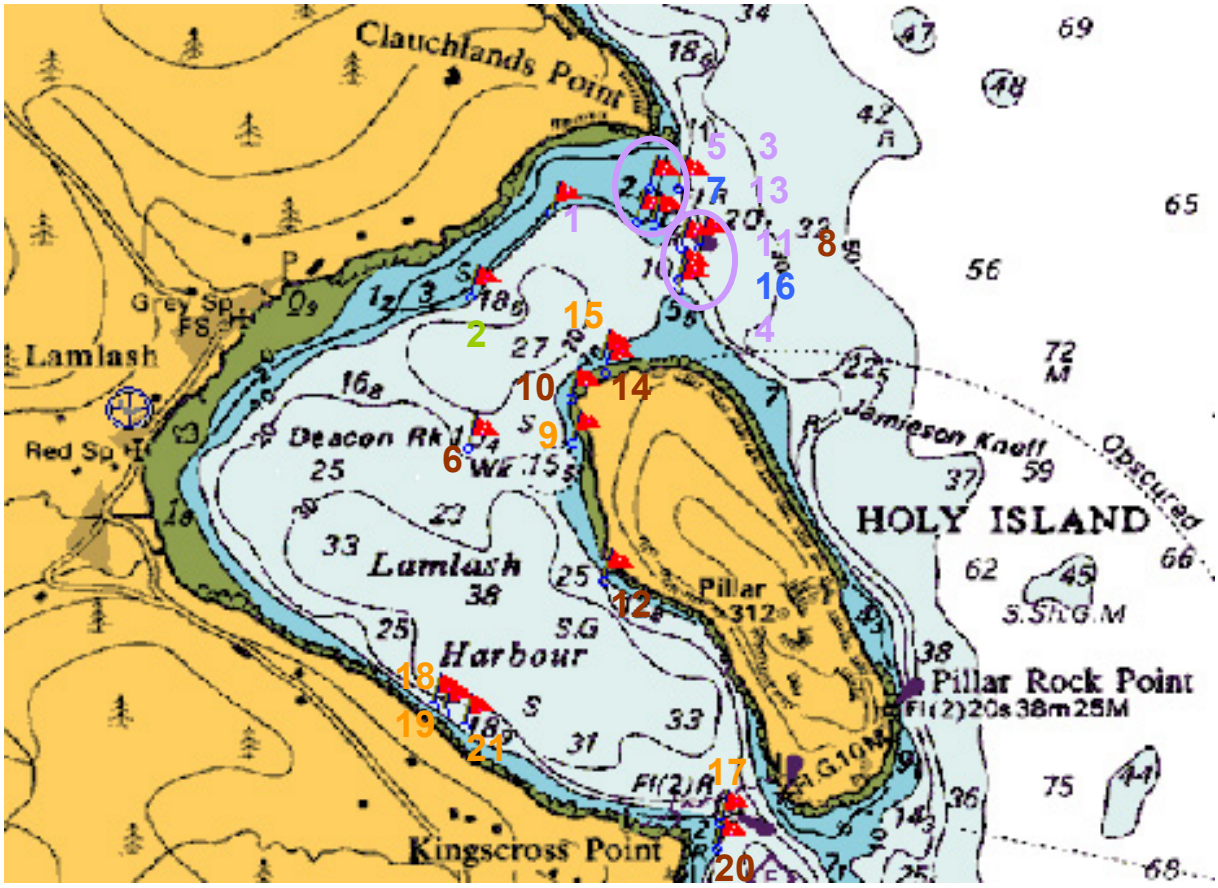


Figure 2 Survey sites in Lamlash Bay marked by flags (the blue circle at flag base marks exact site location). Sites where maerl was recorded are highlighted in purple (site numbering is arranged in the same pattern as the points within the ovals); where scallops were in abundances estimated 'Common' and/or noteworthy (ie. explicit notes made on form) in **brown** (6-8, 10, 12, 14 & 20); where both maerl present and scallops 'Common' in **blue** (7 and 16) and; where both seagrass and maerl recorded in **green** (2). All other sites **orange**.

4.1 Seabed and Seabed Cover Types

The most widely distributed type of seabed recorded was sand (12 sites), followed by boulders (10), mixed ground (9) and rock, cobbles and mud (all recorded at 6 sites) (see Appendix 2). Maerl was recorded as an 'Other' seabed type at sites 4 and 7 although it was also recorded on the sketches and/or species lists for site numbers 1-3, 5, 11, 13 and 16, all to the north of Lamlash Bay (see Figure 2). This is unsurprising since these sites were chosen coinciding with a known deep maerl bed. No maerl was recorded on the seabed from sites to the south of the bay.

Kelp was recorded at 15 of the 21 sites surveyed (please see the tables in Appendices 2 and 3) but only differentiated to species level (*Laminaria saccharina*) at sites 1 and 3-7. Although not subsequently recorded to species level, beds of scallop were recorded from sites 1, 3, 5-8, 10, 12, 14, 17 and 20.

4.2 Interesting species

Following the Seasearch Observer training in March identification by the field recorders of marine flora and fauna was often to Genus, Class or even Subphylum level, emphasising the dictum of 'accuracy rather than guesswork'. Of a total of 70 taxa recorded, 36 were to species level, and 19 were fish, including dogfish, conger eel, leopard-spotted goby, pipefish, gurnard, dragonet and plaice. Exceptional numbers of fish fry were recorded at Gurnard Bay 2 (site 15: see **4.3.4**).

Eel grass, a biodiversity action plan (BAP) listed species, was recorded at the 'Shore Road/Oakbank' site (number 2: see **4.3.1**).

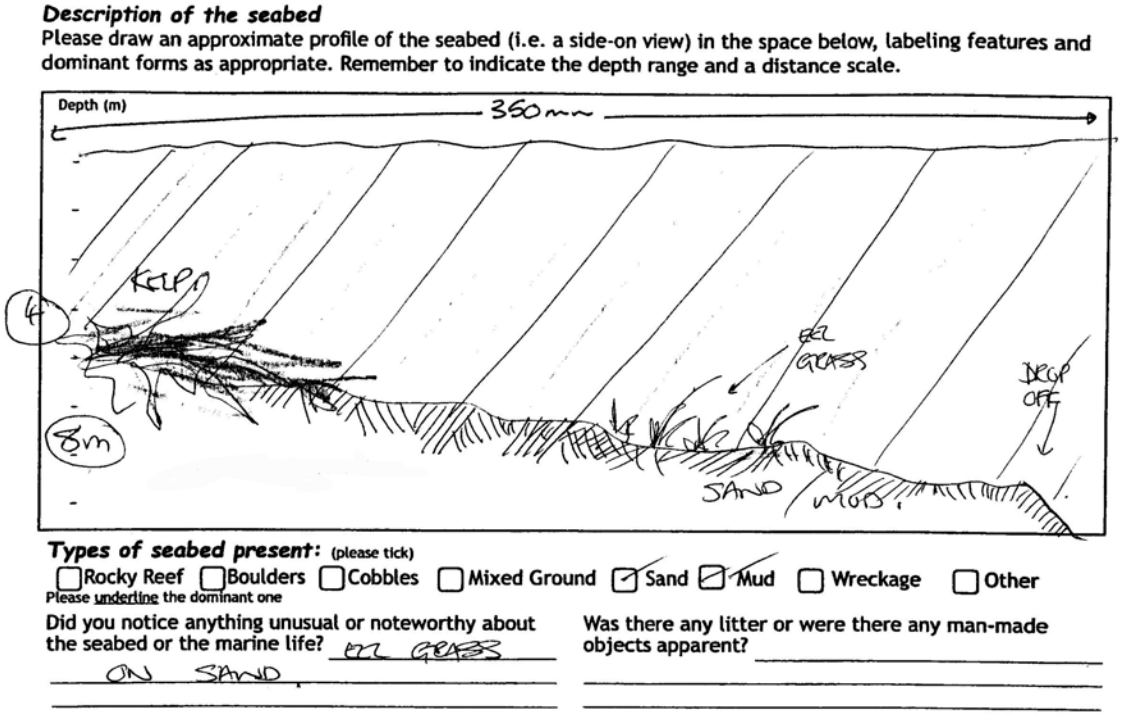
Maerl, albeit somewhat degraded, was recorded from sites throughout the north channel entrance to Lamlash Bay, north of Holy isle (see Figure 2) and both maerl and scallops from the sites detailed in section 4.2. Sites 7 (see **4.3.2**) and 16 (see **4.3.3**)were recorded as being particularly abundant in maerl. When an estimate of percentage live:dead maerl was made, the highest ratio was recorded at Site 1 (25% live:75% dead) with 10-15% live estimated at sites 3 and 5 and only 5-10% live at site 16.

Exceptional numbers of juvenile scallops were recorded at north channel buoy (site 8), Fullarton rock in the south of the bay (site 20: see **4.3.7**) and, after 'years of absence', a number at Deacon Rock (site 6: see **4.3.5**). Scallops were also recorded as 'Common' at sites 7, 10, 12, 14 and 16. The 'Ledges Behind the Fish Farm' site (number 19: see **4.3.6**) was deemed noteworthy for the lack of scallops, a site according to anecdotal accounts previously abundant in scallops a decade ago.

4.3 Representative sites in Lamlash Bay

As the Seasearch Observer methodology is equivalent to a Phase I survey, neither detailed description of habitat zonation in Lamlash Bay nor objective assessments of habitat quality and species richness can be made. The Seasearch forms do however provide a baseline summary of the distribution of major seabed types, and some of the dominant, more visible or interesting associated taxa such as kelp, maerl and scallops, in Lamlash Bay. Representative dives from those mapped in Figure 2 are described with sketches and, where available, photographs.

4.3.1 Oakbank/Shore Road: 55°32.45 N, 005°06.10 W (site 2)



Sketch: Don Macneish

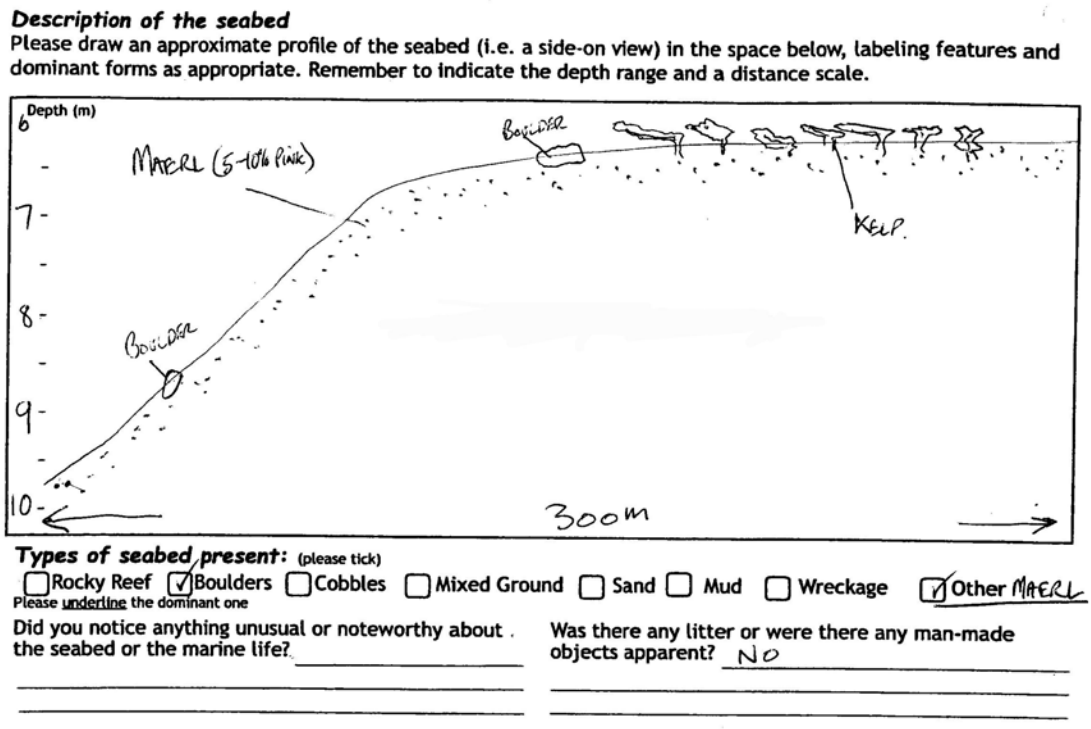
Description entered into Marine Recorder (licence MRMCS002):
A gentle slope of mixed sand and mud, with occasional maerl, descending over a horizontal distance of ~350m from a depth of 4m bsl to the start of a drop-off at 8m bsl. Kelp park, wrack and mixed seaweeds were recorded at 4m bsl and a patch of eel grass recorded at ~8m bsl. Some short animal turf in the form of hydroids was also recorded.

Common species: *Ensis sp, Cerianthus lloydi, Pagarus sp, Adamsia carciniopados*

Figure 3 Sketch, description and common species at Oakbank/Shore Road site (2). Note - Although maerl did not feature on the seabed sketch, it was listed on the species list for the original form.

4.3.2 Clauchlands Maerl bed: 55°32.70 N, 005°04.95 W (site 7)

The following is chosen to represent sites 3, 5, 7 and 13 to the north of the north channel entrance into Lamlash Bay.



Sketch: Howard Wood

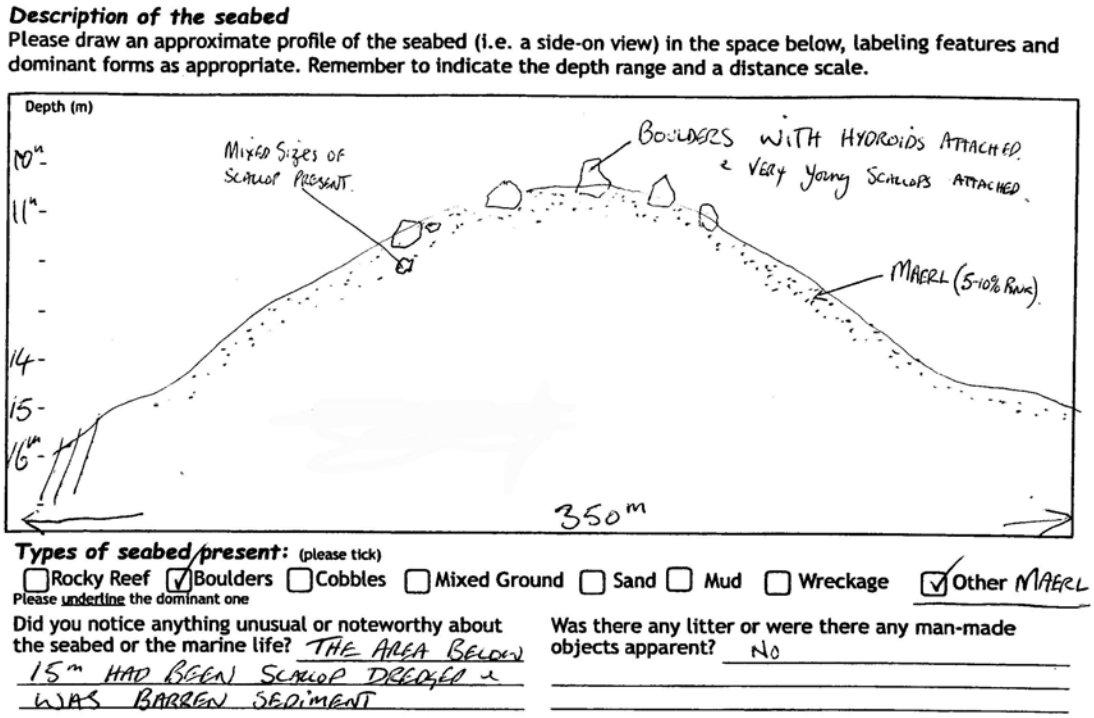
Description entered into Marine Recorder (licence MRMCS002):
A slope of maerl (5-10% live) descending from ~6m bsl down to ~10m bsl with occasional boulders, over a horizontal distance of ~100m. Sugar kelp park was common on the flat seabed at the top of the slope (~150m horizontal distance) at a depth of ~6m bsl. Scallops, burrowing anemones, gobies and swimming crabs were common on the maerl.

Common species: *Phymatolithon*, *Cerianthus lloydi*; Polybiinae indet. (Swimming crabs), Pectinidae indet., *Gobiusculus flavescens*, and *Thorogobius ephippiatus*

Figure 4 Sketch, description, common species and photographs indicative of sites to the north of the north channel entrance to Lamlash Bay. Photographs (l-r): maerl, *Porania pulvillus* and *Espiriopsis* sp (credit: Howard Wood, COAST)

4.3.3 Maerl Bank north of Holy Isle 55°32.50 N, 005°04.80 W (site 16)

The following is chosen to represent sites 4, 8, 11 and 16 in the midst of the north channel entrance into Lamlash Bay.



Sketch: Howard Wood

Description entered into Marine Recorder (licence MRMCS002):
A sedimentary ridge consisting of maerl (~5-10% living) rising from ~16m bsl to 10m bsl and descending again to ~15m bsl over a total horizontal distance of ~350m. Boulders with hydroids attached were scattered across the top of the ridge. A range of sizes of scallops were present on the maerl with very young specimens also found attached to the hydroids on the boulders.

Common species: *Phymatolithon*; Majoidea indet., Polybiinae indet, Pectinidae indet. *Ascidiella aspersa*

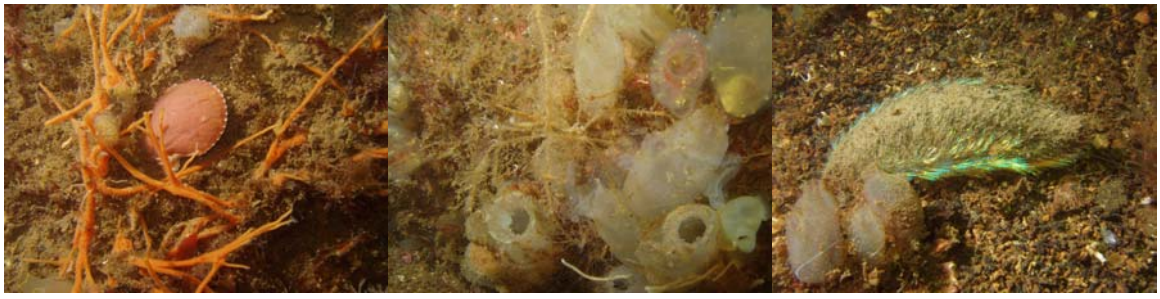
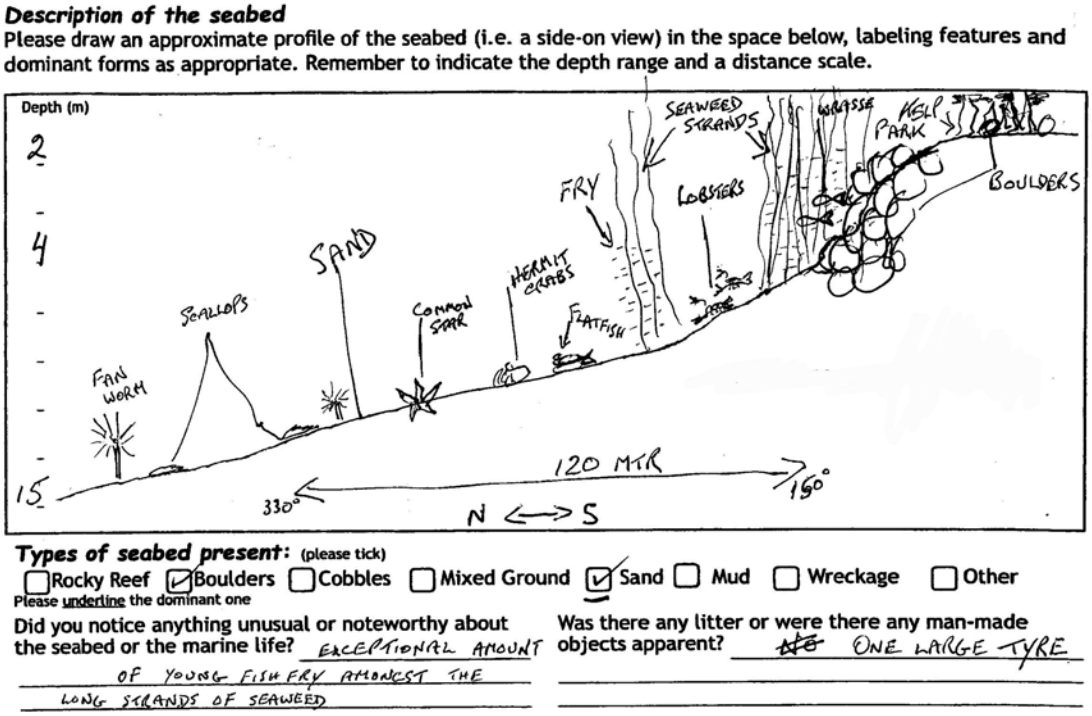


Figure 5 Sketch, description, common species and photographs indicative of sites in the midst of the north channel entrance to Lamlash Bay. Photographs (l-r): Scallop and sponge, mixed tunicates and *Aphrodite aculeata* (credit: Howard Wood, COAST)

4.3.4 Gurnard Bay 55°32.202 N, 005°05.237 W (site 15)



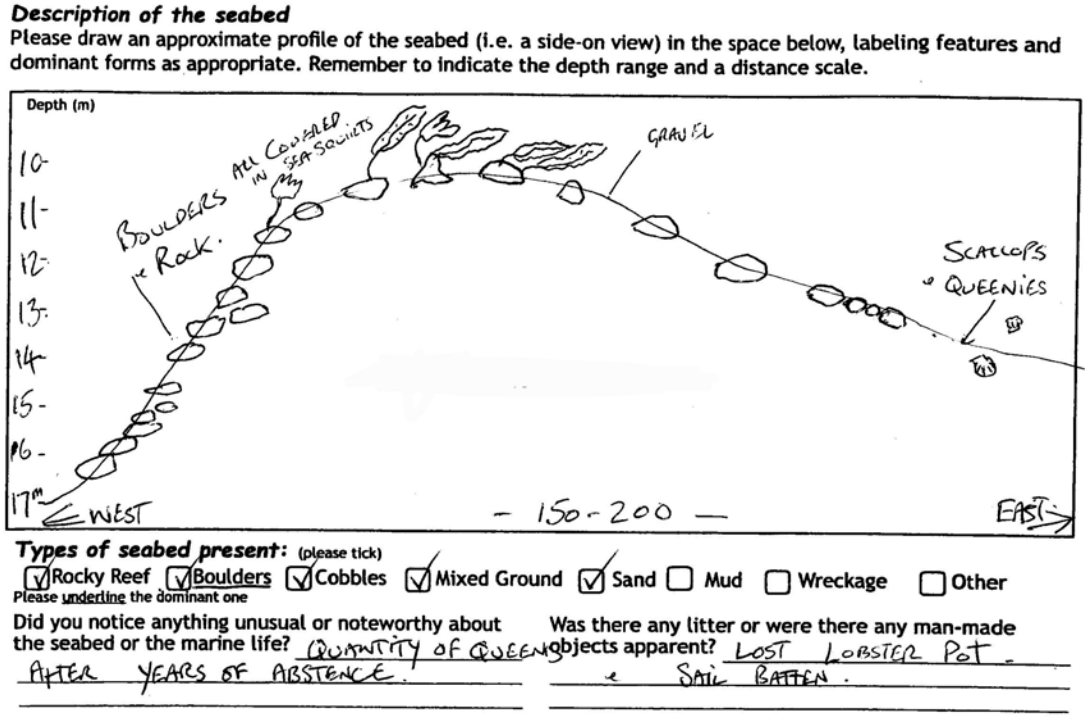
Sketch: John Ferris

Description entered into Marine Recorder (licence MRMCS002):
Kelp park covers boulders laying flat at ~2m bsl at the top of a boulder slope. The boulders then drop off steeply to the north (at a bearing of 330 degrees) from ~2m bsl to ~4m bsl. Sea-whip covers the boulders on the slope. (An exceptional amount of young fish fry were recorded amongst the strands of seawhip.) A sandy seabed then slopes gradually from ~4m bsl to ~15m bsl with hermit crabs. starfish, scallops and flatfish. One large tyre was also recorded on the seabed.

Common or occasional species: Laminariales indet, *Homarus gammarus*, *Asterias rubens* and *Labrus bergylta*

Figure 6 Sketch, description and common or occasional species in Gurnard Bay.

4.3.5 Deacon Rock 55°31.95 N, 005°05.90 W (Site 6)



Sketch: Howard Wood

Description entered into Marine Recorder (licence MRMCS002):
Deacon rock is a submerged reef rising from 17m bsl to the west up a steep slope of sea-squirt covered boulders (over a horizontal distance of ~60m) to a sugar kelp crowned apex at ~10m bsl. The gradient to the east of the reef top is not so steep descending to ~14m bsl over a horizontal distance of ~100-120m with occasional boulders. A lost lobster pot and sail batten were also reported on the seabed during this dive.

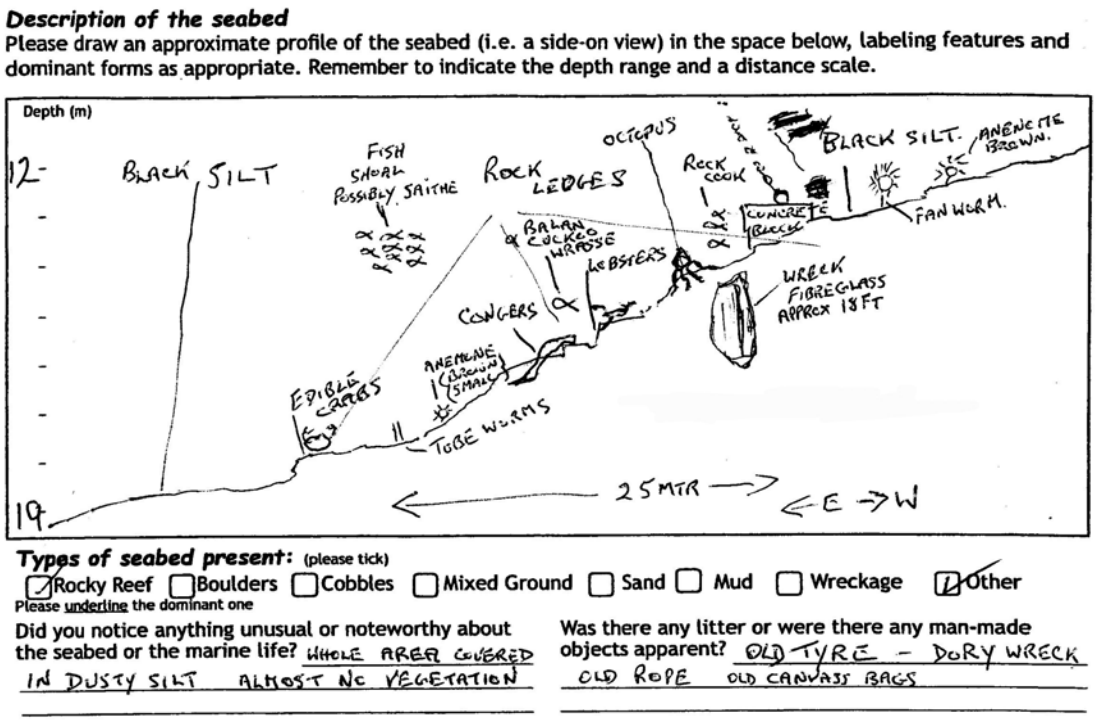
Common species: *Laminaria saccharina*, mixed red seaweeds, Galatheidea indet, Polybiinae indet (swimming crabs) and Paguridae indet

Figure 7 Sketch, description and common species at Deacon Rock (site 6)

4.3.6 Fish Farm Cages 55°31.023 N, 005°06.113 W (Site 18)

The following is chosen to represent sites 18, 19 and 21 in the vicinity of the Lamlash Bay salmon farm, the only fish farm in North Ayrshire. It is worth noting that for Site 19 'The Ledges behind fish farm', immediately adjacent to site 18, it was deemed noteworthy that the site was:

"full of junk, not one scallop unlike 10 years ago".



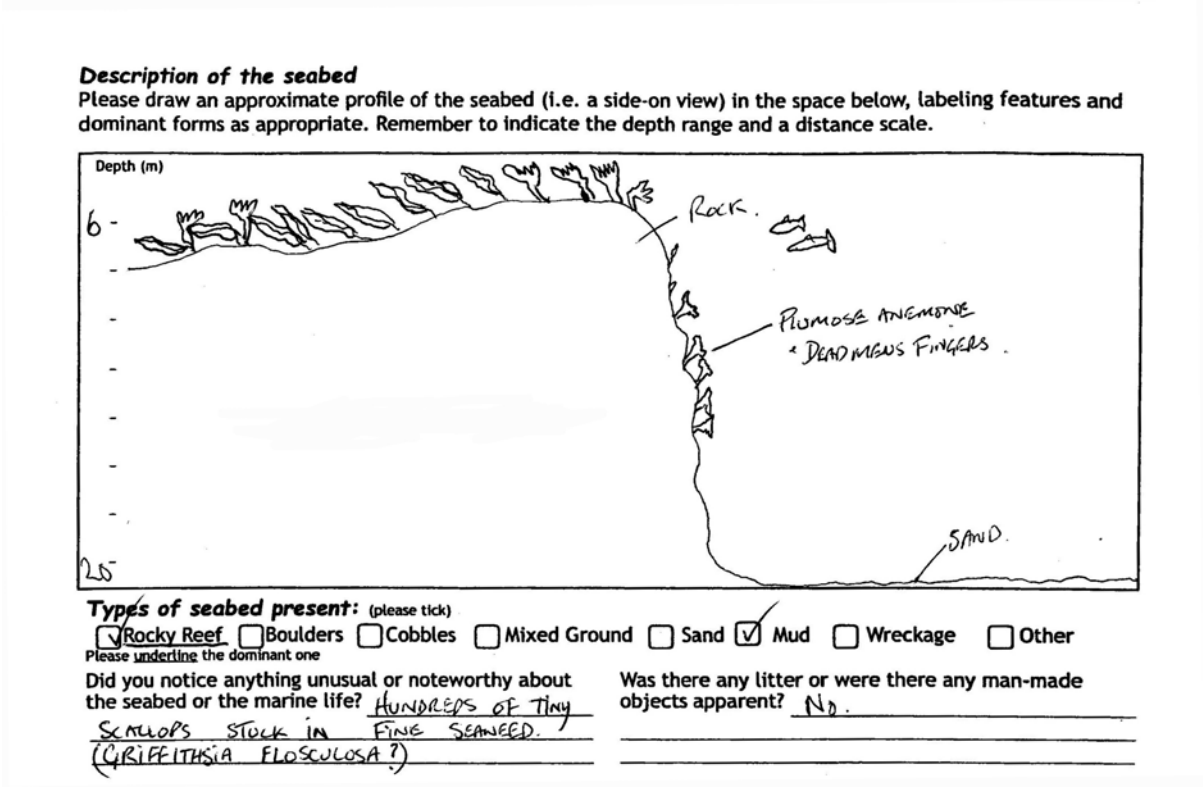
Sketch: John Ferris

Description entered into Marine Recorder (licence MRMCS002):
A series of bedrock ledges descending from ~12m bsl to ~19m bsl over a horizontal distance of ~25m from west to east. The whole survey area was covered in a black silt with almost no marine flora. On the seabed were also a concrete mooring block and attached chain, fibreglass wreck (~6m long), old tyre, old rope and old canvass bags. Attendant marine life included edible crabs, tubeworms, anemones, conger eels, lobsters and numerous wrasse.

Common species: *Cancer pagarus, Centrolabus exoletus* and tube worms indet.

Figure 8 Sketch, description and common species at Fish Farm Cages (sites 18, 19 and 21).

4.3.7 Fullarton Rock 55°30.52 N, 005°04.60 W (Site 20)



Sketch: Howard Wood

Description entered into Marine Recorder (licence MRMCS002):
A horizontal rocky reef with kelp forest at ~6m bsl descending vertically down to flat sandy mud at ~20m bsl. The rock wall is rich in plumose anemones and dead mens fingers. Hundreds of tiny scallops were recorded among fine seaweeds.

Common species: *Metridium senile, Echinus esculenta,* tunicata indet*, Pollachius pollachius, Pollachius virens, Gobiusculus flavescens* and *Thorogobius ephippiatus*

Figure 9 Sketch, description, common species and photographs depicting Fullarton Rock (site 20). Photographs: Short animal turf of hydroids and tunicates; *Metridium senile* and; juvenile scallops in branching brown seaweed (credit: Howard Wood, COAST)

5 DISCUSSION

In an area with no existing sublittoral records, the survey team, having undertaken Seasearch Observer training in March 2003, conducted a baseline survey of interesting areas within Lamlash Bay. Understandably, there was a preponderance of sites surveyed in the north channel entrance to the bay where the field recorders were aware of an existing maerl bed. Sites 1-5, 7-11 and 13-16 are within the extent of the proposed Arran Marine Regeneration Trial No-Take Zone (NTZ) (COAST, 2003). With the exception of sites 8, 9, 10, 14 and 15, maerl was recorded at all sites within the proposed NTZ trial area. The remaining sites (6, 12 and 17-21) are outwith the proposed NTZ area but within the proposed Marine Protected Area (MPA) of the Arran Marine Regeneration Trial proposal.

The 70 taxa recorded by the COAST members was not untypical for the Firth of Clyde Area, with Pisces, represented by 19 species, being the taxon with which the recorders had greatest confidence recording. Given the greater expertise needed to differentiate many of the sponge, crustacean, molluscan, echinodermatan, tunicate, and algal species that may have been present within Lamlash Bay, this is to be expected. However, there are enough records of noteworthy taxa to merit further investigation, namely commercially important species such as scallops (Pectinidae) and flatfish (Pleuronectiformes) and ecologically important species such as *Phymatolithon* and *Zostera* (see Appendix 3)

If there were scope for the proposed Arran Marine Regeneration Trial to proceed with academic and/or statutory support, ongoing quantitative monitoring of the following could be considered as potential indicators of benthic regeneration within the bay:

- status of the deep maerl ridge in the north channel entrance and sea grass at site 2;
- scallop density throughout the bay, particularly at the north and south channel entrances and Deacon Rock and;
- quantity of commercially important flatfish and other fish species.

Regardless of capacity for wider support, there exists much future scope for Seasearch, including baseline surveys of other areas of the bay such as the southwest coast of Holy Isle and the coast between Kingscross Point and the fish farm. To build on their worthwhile start to Seasearch, members of Arran COAST are in an excellent position to continue through the Seasearch training to Surveyor level if desired.

6 CONCLUSIONS

The survey, although not designed to collect detailed information on species distributions, provided a spread of sites throughout Lamlash Bay. Throughout the survey, the field recorders were true to the Seasearch Observer methodology favouring accurate recording, often to Genus, Class or Subphylum level, rather than guessing species names from identification books.

It is hoped that the present report of COAST Seasearch activity can provide:

- a baseline upon which to gather more Seasearch data for inclusion in Marine Recorder;
- a guide to steer potential future quantitative monitoring and;
- a focus for ongoing discussion regarding the Arran Marine Regeneration Trial.

Although the maerl ridge and seagrass bed may not be of a quality to merit designation of Lamlash Bay for purely habitat conservation reasons under existing domestic and European legislation, the impressive support generated among local stakeholders by COAST for the proposed Arran Seabed Marine Regeneration Trial coupled with the potential suitability of the seabed for regenerating both maerl and commercially important species such as scallops, merits careful consideration of the COAST proposal in the light of existing initiatives such as the Strategic Review of Inshore Fisheries and, particularly, the Sustainable Scotland Marine Environment Initiative.

7 REFERENCES

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8 ACKNOWLEDGEMENTS

This interim report could not have been written without the Seasearch data collected by the Arran COAST divers in their own time and at their own expense with their own diving equipment. The author would like to acknowledge the COAST divers as a good example of Seasearch at a local level under their own initiative.

APPENDIX 1

COMPLETED SEASEARCH OBSERVER FORM (EXAMPLE)

MRMSO2000008

Observation Form

seasearch

exploring the undersea world

This form asks for two types of information from your dive - what the seabed was like and what marine life you saw. *Please read the accompanying guidance notes before completing the form.* By completing this form, you will be adding to our knowledge of the near-shore marine environment - helping it to remain fit for life!

Please complete the following sections in BLOCK CAPITALS

Name	DON MACKENZIE
Address	SHIPFIELD
	LAMLASH
	ISLE OF ARRAN
	SCOTLAND Postcode KA27 8NS
Tel: Home	01770 600538 Work
Email	Buddy's Name HUNTERCOMBE

Site Name (if known) CLAUCHLANDS NO MARK	Date of Dive: 25/6/03
	Start of Dive: 11 :30 (24hr)
General Location (inc county) RED BUOY MOORING FOR HAMILTON ROCK.	Dive Duration: 40 (mins)
	U/W visibility: 5 m (whole figure only)
	Sea Temperature 16 °C
Position of centre of site: 55 °32.80 N 5 °04.98 W or E	or OS Grid Reference:
Position derived from (circle one): GPS (Admiralty Chart) OS Map Other	~~Drift Dive?~~ ~~yes~~ / no Night Dive? ~~yes~~ (no)
Did you take any photographs ~~yes~~ (no) or Video footage ~~yes~~ (no)	

thank you for completing this form

All that's left for you to do is to fold this form into thirds along the dotted lines, tuck one part into another, add a stamp and send it off.

The data that you have supplied will be entered onto a database and used to help in the future managemnet of near-shore areas. In time you will receive free Newsletters providing feedback about the Seasearch Project, by Email if appropriate. Both Observation and Survey Recording forms can be downloaded from the Seasearch Website (www.seasearch.org.uk)

for office use only

Please affix stamp here

SEASEARCH Pilot Scheme
Marine Conservation Society
9 Gloucester Road
Ross-on-Wye
Herefordshire
HR9 5BU

seasearch

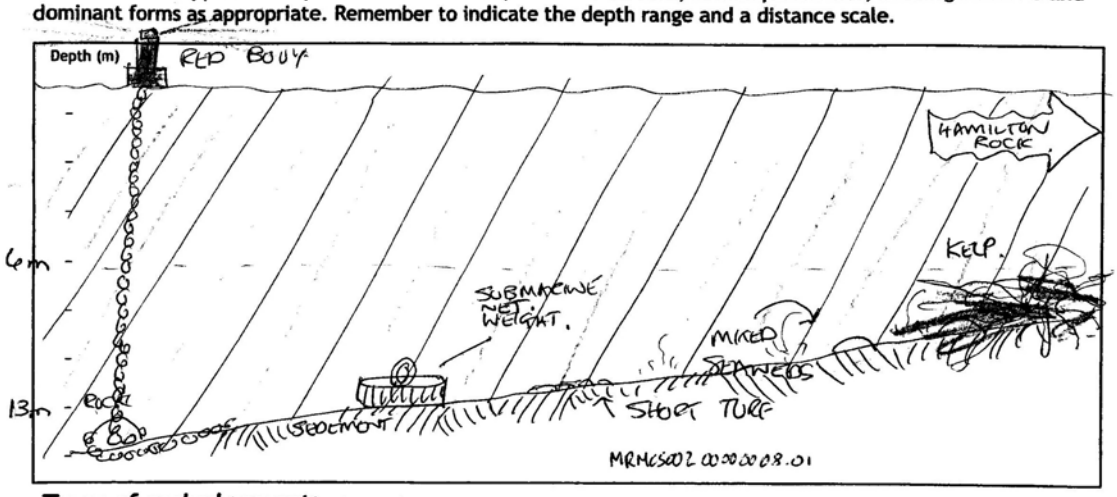
The Seasearch Pilot Project has been sponsored by English Nature, Environment Agency, The Countryside Council for Wales, Scottish Natural Heritage and Project Aware (UK)
Seasearch is supported by all of the major UK diving organisations.

APPENDIX 1

COMPLETED SEASEARCH OBSERVER FORM (EXAMPLE continued)

Description of the seabed

Please draw an approximate profile of the seabed (i.e. a side-on view) in the space below, labeling features and dominant forms as appropriate. Remember to indicate the depth range and a distance scale.



Types of seabed present: (please tick)

☐ Rocky Reef ☑ Boulders ☑ Cobbles ☐ Mixed Ground ☑ Sand ☑ Mud ☐ Wreckage ☐ Other

Please underline the dominant one

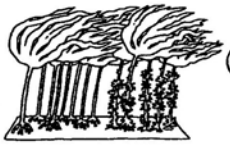
Did you notice anything unusual or noteworthy about the seabed or the marine life? LIVE MERL WAS PRESENT ON DEAD STUFF 10 – 15 %

Was there any litter or were there any man-made objects apparent? ~~TSO~~ WEIGHT FROM SUBMARINE NET FROM WORLD WAR II OR I

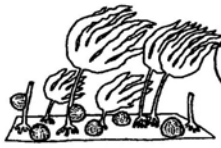
What marine life did you see on your dive? *see Guidance Notes*

Seabed cover types mark as **R** (rare), **O** (occasional) **C** (common) or **P** (present)

Kelp forest — P

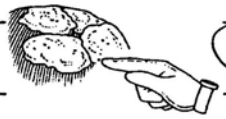


Kelp park — O



Mixed seaweeds — C

Encrusting pink algae — P



Animal turf on rocks

Short — C

Tall — C

Animal bed

Mussels — P

Brittlestars — R

Scallops — P

Sediment with life apparent (tubes, burrows etc.) — C

Barren Sediment (no life or structures apparent) — R

Illustrations by Bob Foster-Smith

Species you saw

Make these identifications as accurate as y can. Indicate approximate abundance with R, O, C or P. *see Guidance Notes*

Species	R, O, C or P
MAERL	R
HYDROIDS	O
BURROWING ANEMONE	O
CLOAK " "	O
HERMIT CRABS	O
LESSER SPOTTED DOGF	R
ORANGE SPONGE	O
SPIDER CRABS.	O
DULSE	C
ASTROPECTEN IRR.	O
COMMON SUN STAR	O
BLADDER WRACK	C
BOOT LACE	C
SUGAR KELP.	C
SWIMMING BLUE CRAB.	O
SCALLOPS	O

APPENDIX 2

LIST OF SITES SURVEYED

Key: **Seabed Types: R –** rocky reef**;** B – boulders**; C** – cobbles**; MG** – mixed ground**; S** – sand**; M** – mud**; W** – wreckage**; O** – other
Cover types: KF – kelp forest**; KP –** kelp park**; MS** – mixed seaweeds**; EPA –** encrusting pink algae**; SAT –** short animal turf**; TAT –** tall animal turf**; ABB –** animal bed brittlestars**; ABM –** animal bed mussels**; ABS –** animal bed scallops**; SLA –** sediment with life apparent**; BS** – barren sediment

Site No.	Date	Site Name	Divers	Depth (m bcd)		Latitude	Longitude	Seabed Type	Seabed Cover Type
				Min	Max				
1	04/08/03	Clauchlands point	Don MacNeish Howard Wood	1.5	11.4	55°32.750 N	5°5.500 W	C; MG	KP; MS; EPA; SAT; TAT; ABS; SLA
2	26/06/03	Shore Road/Oakbank	Don MacNeish Howard Wood	1.9	5.6	55°32.450 N	5°6.100 W	S; M	KP; MS; SAT; SLA
3	31/08/03	Clauchlands No-Take	Don MacNeish Frank Law	5.6	11.6	55°32.800 N	5°4.840 W	B; C; S; M	KF; KP; MS; EPA; SAT; TAT; ABM; ABB; ABS; SLA; BS
4	04/08/03	Clauchlands red buoy (South)	Don MacNeish Frank Law	2.5	12.8	55°32.400 N	5°4.850 W	R; S; O (Maerl)	KP; MS; EPA; SAT; TAT; SLA
5	25/06/03	Clauchlands red buoy (North)	Don MacNeish Howard Wood	3.5	10.4	55°32.800 N	5°4.980 W	B; C; S; M	KF; KP; MS; EPA; SAT; TAT; ABM; ABB; ABS; SLA; BS
6	15/07/03	Deacon Rock	Howard Wood Martin Wood	7.3	14.6	55°31.950 N	5°5.900 W	R; B; MG; S	KP; MS; SAT; TAT; ABB; ABS; SLA
7	03/08/03	Clauchlands Maerl Bed	Don MacNeish Howard Wood	5.2	9.5	55°32.700 N	5°4.950 W	B; O (Maerl)	KP; ABS; SLA
8	21/09/03	North Channel Buoy	Angus Robson John Ferris	7.4	10.1	55°32.620 N	5°4.700 W	MG	SAT; ABS; SLA
9	20/08/03	St Molios North	John Ferris Karl Amos	+0.5	16.6	55°31.950 N	5°5.400 W	MG	KP; 0MS; EPA; SAT
10	21/09/03	St Molios North	Angus Robson Sean Ferris	5.7	15.8	55°32.100 N	5°5.340 W	MG; S	KP; TAT; ABS
11	14/06/03	Hamilton Rock West	Howard Wood John Ferris	3	7.4	55°32.600 N	5°4.810 W	B; MG	KF; MS; SAT; TAT

Site No.	Date	Site Name	Divers	Depth (m bcd)		Latitude	Longitude		Seabed Type
				Min.	Max.				
12	10/09/03	The Edge	JohnFerris Sean Ferris	4	25.8	55°31.485 N	5°5.190 W	B; C; S	MS; SAT; TAT; ABS
13	08/06/03	O2 Lamlash	Angus Robson Sean Ferris	0.1	9.2	55°32.700 N	5°5.030 W	C; S	KF; KP; MS; R; R; O
14	11/08/03	Gurnard Bay	Sean Ferris	3.2	13.6	55°32.187 N	5°5.291 W	B; S; W	KF; KP; ABS
15	11/08/03	Gurnard Bay 2	John Ferris Karl Amos	1.2	14	55°32.202 N	5°5.237 W	B; S; M	KP; MS; EPA; SAT; SLA
16	10/08/03	Maerl Bank North of Holy isle	Howard Wood Martin Wood	8.2	13.8	55°32.500 N	5°4.800 W	B; O (Maerl)	SAT; ABS; SLA
17	16/09/03	South Channel Bay	Sean Ferris	7.2	26	55°30.660 N	5°4.512 W	MG; S	SAT; TAT; ABB; ABS
18	31/08/03	Fish Farm Cages	Angus Robson John Ferris	11.7	18.8	55°31.023 N	5°6.113 W	R; O (rubbish)	SAT; SLA
19	25/07/03	Ledges behind fish farm	Howard Wood	1.9	18.9	55°31.050 N	5°6.100 W	R; B; C; MG; M	KP; MS; EPA; SAT
20	10/08/03	Fullarton Rock	Howard Wood John Ferris	3.3	17.6	55°30.520 N	5°4.600 W	R; M	KF; KP; MS; EPA; SAT; TAT; ABS; SLA
21	13/09/03	Fish Farm 2	Sean Ferris	3	18.3	55°30.970 N	5°5.927 W	B; MG; S	MS; SAT

APPENDIX 3

SPECIES LIST

MCS Code Letter	No.	Taxon	Common Name	Site Nos.
Porifera				
C	1	*Porifera indet.*	Sponges	1, 3, 5, 16
Cnidaria				
D	58	*Hydrozoa*	Hydroids indet.	1, 2, 4, 5, 6, 20
D	463	*Nemertesia antennina*	Antennae hydroid	16
D	583	*Anthozoa*	Anemones indet.	8,9,11
D	597	*Alcyonium digitatum*	Dead Men's Fingers	20
D	632	*Cerianthus lloydii*	Burrowing anemone	1, 3, 4, 5, 7, 16, 18
D	679	*Anemonia viridis*	Snakelocks anemone	19
D	710	*Metridium senile*	Plumose anemone	20
D	743	*Adamsia carciniopados*	Cloak anemone	1,3,4,5,16
D	783	*Caryophyllia smithii*	Devonshire Cup Coral	6, 20
Nemertea				
G	26	*Tubulanus*	Football jersey worm	6, 10
Annelida				
P	18	*Aphrodite aculeata*	Sea Mouse	16
P	1195	*Lanice conchilega*	Sandmason	9, 15, 18
P	1256	*Sabellida*	Tube worm indet.	8, 9
P	1320	*Sabella pavonina*	Peacock worm	9, 15, 18
Crustacea				
S	1400	*Homarus gammarus*	European lobster	9, 15, 18, 19, 21
S	1445	*Paguridae*	Hermit crabs indet.	1, 2, 3, 4, 5, 6, 8, 9, 15, 16
S	1462	*Pagurus prideaux*		1
S	1469	*Galatheidae*	Squat Lobsters indet.	6, 16, 17, 19, 20
S	1511	*Majoidea*	Spider crabs indet.	1, 3, 4, 5, 8, 13, 16
S	1566	*Cancer pagurus*	Edible crab	4, 7, 8, 9, 18, 19, 20
S	1573	*Polybiinae*	Swimming crab indet.	5, 6, 7, 16, 19
S	1580	*Liocarcinus depurator*	Swimming crab	3
S	1589	*Necora puber*	Velvet swimming crab	20
Mollusca				
W	1243	*Nudibranchia*	Sea-slugs indet.	13
W	1320	*Onchidoris indet*	Sea lemon indet.	6
W	1691	*Mytilidae*	Mussels indet.	3, 5
W	1768	*Pectinidae*	Scallops indet.	1, 2, 3, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 20
W	1996	*Ensis*	Razor shell	1, 2
W	2398	*Eledone cirrhosa*	Curled Octopus	18
Bryozoa				
Y	170	*Membranipora membranacea*	Sea mat	7
Echinodermata				
ZB	8	*Antedonidae*	Featherstars	7,16
ZB	18	*Asteroidea*	Starfish indet.	17
ZB	22	*Luidia ciliaris*	Seven arm starfish	6, 16
ZB	26	*Astropecten irregularis*	Sand star	1, 2, 3, 4, 5
ZB	54	*Porania pulvillus*	Red cushion star	8, 9, 11, 16

MCS Code Letter	No.	Taxon	Common Name	Site Nos.
ZB	75	*Crossaster papposus*	Common sunstar	5, 8, 9, 11
ZB	100	*Asterias rubens*	Common starfish	8, 9,11,15
ZB	115	*Ophiurida*	Brittlestar indet.	3, 5, 6, 11, 17
ZB	198	*Echinus esculentus*	Common Urchin	4, 20
Tunicata				
ZD	2	*Ascidiacea*	Sea-squirts indet.	6,9,10,19,20
ZD	7	*Clavelina lepadiformis*	Light bulb sea-squirt	3, 4, 6, 16
ZD	84	*Ascidiella aspersa*		16
Pisces				
ZF	28	*Scyliorhinus canicula*	Dogfish	1, 3, 5, 7, 9, 11, 17
ZG	17	*Conger conger*	Conger eel	6, 18, 19
ZG	129	*Molva molva*	Ling	19
ZG	134	*Pollachius*	Pollack or Saithe indet.	18
ZG	135	*Pollachius pollachius*	Pollack	9, 20
ZG	136	*Pollachius virens*	Saithe	20
ZG	235	*Syngnathidae*	Pipefish indet.	21
ZG	260	*Triglidae*	Gurnard indet.	10
ZG	273	*Cottidae*	Scorpion fish indet.	7, 11, 12
ZG	390	*Centrolabrus exoletus*	Rock Cook	9, 18
ZG	399	*Labrus bergylta*	Ballan wrasse	6, 7, 9, 15, 18, 19, 20
ZG	400	*Labrus mixtus*	Cuckoo wrasse	18, 19, 20
ZG	440	*Pholis gunnellus*	Butterfish	7
ZG	451	*Callionymus*	Dragonet	6, 7, 16
ZG	455	*Gobiidae*	Gobies indet.	11
ZG	470	*Gobiusculus flavescens*	Two spot goby	7, 20
ZG	483	*Thorogobius ephippiatus*	Leopord-spotted goby	6, 9, 20
ZG	545	*Pleuronectiformes*	Flatfish indet.	10, 13, 14, 15, 17, 21
ZG	578	*Pleuronectes platessa*	Plaice	6
			Indet. fish fry	8, 12, 14
Rhodophycota				
ZM	1	*Rhodophycota*	Mixed red algae indet.	1, 2, 3, 5, 6, 8, 11, 12
ZM	252	*Phymatolithon*	Maerl	1, 2, 3, 4, 5, 7, 11, 13, 16
Chromophycota				
ZR	338	*Laminariales*	Kelp indet.	2, 4, 7, 9, 10, 11, 13, 14, 15, 19, 20
ZR	344	*Chordaceae*	Sea-whip	1, 2, 4, 5, 14
ZR	354	*Laminaria saccharina*	Sugar kelp	1, 3, 4, 5, 6, 7
ZR	373	*Fucaceae*	Wracks indet.	1,2,3,4,5
Angiosperma				
		Zostera	Eel grass	2