

TORRIDON 2001 SEASEARCH

Report of a SEASEARCH survey in Loch Torridon, Wester Ross,

June 15th-18th 2001

Sue Scott

February 2002

A report to Scottish Natural Heritage

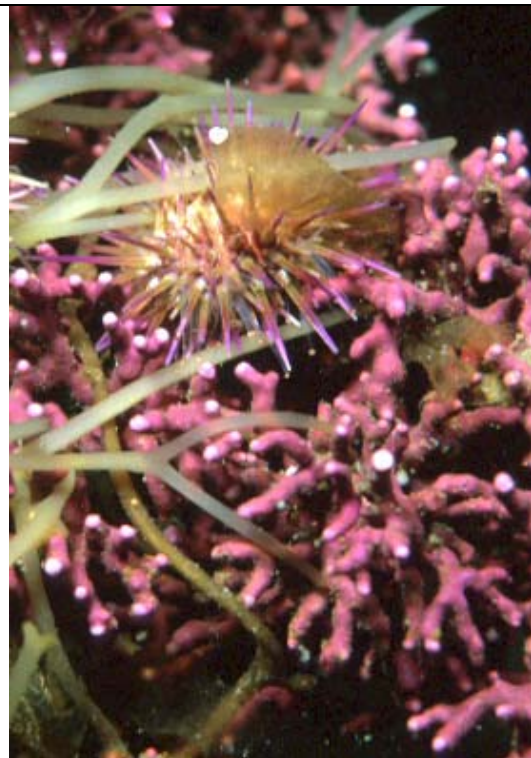
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**Sugar kelp holdfast, maerl & urchin,
Upper Loch Torridon**

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TORRIDON 2001 SEASEARCH**Report of a SEASEARCH survey in Loch Torridon, Wester Ross,****June 15th-18th 2001****SYNOPSIS**

SEASEARCH is a programme of Phase 1 marine biological survey, developed by the Marine Conservation Society and the Joint Nature Conservation Committee. It is 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 a pilot project in Loch Torridon (McHattie 1999), the Minch Project supported a SEASEARCH survey in August 2000 to add to the information on underwater sites, habitats and species in the loch (Scott 2000). The Minch Project aimed to address some of the growing concerns over the state of marine resources in the Minch, by promoting a more sustainable approach to their use.

This survey, supported by Scottish Natural Heritage, was a continuation of the 2000 SEASEARCH. It was carried out by divers from Inverness Sub-Aqua Club (ISAC), Lothian Divers Sub-Aqua Club (LDSAC), and Glasgow University Sub-Aqua Club (GUSAC) between June 15th-18th 2001. SEASEARCH recording forms were completed for 27 sites in the loch system. Biotopes and species recorded by the survey have been listed, and a catalogue of photographs appended. Information on particularly interesting or attractive dive sites visited on the survey will be incorporated into a draft dive guide for Loch Torridon.

The range of biotopes recorded was again typical for sheltered fjordic sealoch systems, with a gradation from outer, more exposed sites with kelp-dominated rocky slopes and coarse clean sediments, to middle areas with boulders on mixed sediments, to sheltered inner areas with silted rock slopes characterised by encrusting algae and ascidians, and mixed muddy sediment slopes. In Loch Diabaig, the seabed is of soft mud with seapen beds, burrowing brittlestars and crustacean burrows. At the head of Upper Loch Torridon, an extensive bed of maerl *Phymatolithon calcareum*, with attached beds of sugar kelp *Laminaria saccharina*, was found in shallow water from 1-5m.

Interesting species recorded on the survey include a very large skate *Raja batis* on Loch Diabaig sill, and the giant foraminiferan *Toxosarcon alba* in muddy sediments at deeper sheltered sites.

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1. INTRODUCTION

1.1. Background to survey

Loch Torridon is a large fjordic sealoch system in Wester Ross, north west Scotland. As part of the Minch Project, the loch and its environs have been the subject of a detailed study of the marine environment, its uses and importance to the local community (McHattie 1999). A SEASEARCH survey was carried in August 2000 (Scott, 2000) to add to the knowledge of the underwater sites, habitats and species of Loch Torridon. This both expanded the existing information base and identified particular locations of interest to divers, which were included in a draft dive guide for the loch (Scott, in prep). The survey was tied in with baseline work, including remote video (ROV) and acoustic surveys, done by others in the loch and supported by PESCA, LEADER, Ross and Cromarty Enterprise, Scottish Natural Heritage (SNH) and The Highland Council. The Torridon 2001 SEASEARCH survey was a continuation of this work, incorporating additional sites not surveyed previously.



Shildaig village and jetty. [Photo No: 98.214.13, S.Scott]

1.2. SEASEARCH

SEASEARCH is a project for volunteer sports divers and others to record useful and accurate observations of underwater habitats and the life they support, thus contributing to the knowledge and understanding of the marine ecology of Britain. The underwater life and scenery of Britain is still little known, even by 'experts', so divers who see the marine life at first hand can contribute invaluable information. SEASEARCH aims to capture this information by recording it on structured forms, which are designed to fit a level of expertise to suit the diver. The aim is both to increase the knowledge and therefore the enjoyment of divers, and to contribute useful information to add to the pool of knowledge of an area. SEASEARCH is managed jointly by the Marine Conservation Society and the Joint Nature Conservation Committee, with funding made available through the country agencies. A starter pack is available giving more detail on SEASEARCH and how the surveys are planned and carried out (Scottish Natural Heritage 1995).

2. PREVIOUS DIVING SURVEYS

A survey by a team of sports divers and biologists was carried out in Loch Torridon in June 1985 (Smith 1985), which looked at 34 sublittoral and 9 littoral sites. The survey recorded a wide range of sublittoral habitats and species, as is to be expected of a loch system of this complexity, with sites ranging from semi-exposed to very sheltered from both wave action and tidal currents. Species recorded from sublittoral sites by divers were mainly prominent, easily recognisable animals. More detailed records of algae and molluscs from the shores, and from samples brought up by divers, reflected the particular specialities of the biologists on the survey.

In November 1998, the Minch Project commissioned the author to compile a set of photographs of Loch Torridon and environs, including 10 sublittoral sites. These aimed to cover a range of the typical habitats and species in the loch, and resulted in a collection of around 180 underwater photographs.

In August 2000, a team of divers, mainly from Lothian Divers Sub-Aqua Club, completed SEASEARCH surveys and recording forms for 28 sites throughout the loch system (Scott 2000). They found a range of biotopes typical for sheltered fjordic sealoch systems, with a gradation from outer, more exposed sites with kelp-dominated rock and coarse sediments to sheltered inner areas with silty rocks and muddy sediments. Of particular note was the deepwater brittlestar *Asteronyx loveni* on the giant sea pen *Funiculina quadrangularis* in Loch Diabaig, the first time this brittlestar had been seen by divers in relatively shallow water (34m).

3. METHODS

3.1. Survey personnel and facilities

The SEASEARCH survey was carried out over the weekend of June 15th-18th 2001, with a team of divers from Inverness Sub-Aqua Club (ISAC), Lothian Divers Sub-Aqua Club (LDSAC) and Glasgow University Sub-Aqua Club (GUSAC). Relatively few of the team had previous experience of SEASEARCH, and only one was a

professional marine biologist. Three club rigid inflatable boats (RIBs) were used, and launched from Shildaig. Most of the team stayed at the camp site at Shildaig.



Launching from Shildaig jetty. [Photo No: 01.125.27, S.Scott]

3.2. Site selection

Sites were selected from Admiralty chart no. 2210 to be additional to those surveyed by the Torridon 2000 SEASEARCH, providing a spread of sites around the loch. Additional information on potentially interesting sites came from remotely operated video (ROV) surveys in the loch undertaken by SNH. These included extensive maerl beds at the head of Upper Loch Torridon.

3.3. Survey methods

Divers worked in pairs, or occasionally as a threesome, generally working from the deepest depth upwards according to safe diving practices and to allow maximum working time in shallow water. Distances to the outer and upper lochs from the launch point at Shildaig are considerable, but fortunately, weather conditions during the survey were good, and the three boats were able to stay within sight of each other for safety, while diving separate sites.

Divers descended to the deepest depth of the dive, then began recording main habitat features and prominent species, using underwater writing boards. Ascending up the slope in a predetermined direction, usually directly towards the shore, they stopped to describe different habitats, noting the depth at which these changed. Species were recorded according to the diver's capabilities. The information was later transferred to SEASEARCH site and dive recording forms (Appendices VI & VII).

Few specimens were collected as logistics on this survey did not allow time for identification. However the more experienced members of the survey were able to assist with identifying specimens in the field. Underwater photographs were taken by Sue Scott.

3.4. Position fixing

Positions were taken with GPS on the boats, or marked on laminated Admiralty charts in the boat where there were sufficient above-water features for accurate location.

3.5. Data analysis

After the survey, depths on the recording forms were corrected to Chart Datum using a Windows tidal programme with adjustments. Biotope codes according to the Marine Nature Conservation Review (MNCR) manual (Connor et al, 1997) were assigned to habitat descriptions where possible, although often neither the data nor the habitat manual was adequate for this task (see discussion).



Northern or purple sunstar *Solaster endeca*, a prominent, easily recognised species. [Photo No: 01.125.11, S.Scott]

4. RESULTS

Recording forms were completed for 27 sites during the survey. Site locations are marked on Figure 1 and listed in Appendix I. Sites have been numbered from 29-55, to follow on from the Torridon 2000 SEASEARCH survey. Because this survey was partly filling in gaps from previous surveys, the spread of sites was not as evenly distributed throughout the loch system than on the previous SEASEARCH. Most sites

concentrated in the centre of the loch system, and on the maerl beds at the head of Upper Loch Torridon. Good sea conditions on the first day also gave the opportunity for surveying a few exposed sites at the loch south entrance, in the Inner Sound.

Biotope codes (Connor, et al. 1997) were assigned (with difficulty, see below) to habitats at the sites surveyed. These are listed in Appendix II, and in Appendix III by site. However the uneven spread of sites, together with the uncertainty of assigning biotope codes, makes it not particularly easy or helpful to present the distribution of biotopes in map form, as done for the previous SEASEARCH survey. For the general distribution of habitat types in the Loch Torridon system see Scott (2000). The species identified on the survey are listed in Appendix IV. A set of photographs from the survey has been mounted, labelled and catalogued (Appendix V).

5. DISCUSSION

5.1 Assignment of biotope codes

The assignment of biotope codes to habitats according to the descriptions in the MNCR manual (Connor et al 1997), proved particularly difficult for this survey. This was largely because the data was not adequate for this purpose, particularly when accurate species identifications are required for the assignment of a biotope (for the species of kelp, for instance, which are often very difficult to identify in sealoch conditions). However it was also because some easily recognisable, discrete biotopes encountered in the loch, often at more than one site, appear not to be described in the MNCR manual, as noted for the previous SEASEARCH survey (Scott 2000). Many of the sediment biotopes could not be given a biotope code because the descriptions rely on identification of infauna. Thus the biotope codes should be taken as an indication only. Less 'best guesses' have been applied than for the previous survey because the information was judged to be inadequate.

5.2 Distribution of biotopes in Loch Torridon.

5.2.1. Rocky infralittoral biotopes.

Kelp-dominated biotopes were found at most sites with bedrock or boulders, and followed the general pattern of curvilinear kelp *Laminaria hyperborea* forest and park in the outer, more exposed parts of the loch system, while in more sheltered parts in the middle and upper lochs sugar kelp *L. saccharina* was dominant (Scott 2000). *L. saccharina* was also found on mixed substrata, on pebbles and shells in sediments, and in dense beds attached to maerl at the head of Upper Loch Torridon (see below). At a number of sites the species of kelp was not recorded, therefore a second order biotope code could not be assigned.

Mixed *Alaria esculenta* and *L. digitata* (EIR AlaLdig), characteristic of sublittoral fringe rocks in exposed situations, was found at 1.6m at Site 32, the most exposed site on the north side of the outer loch. These kelps were probably also present at other exposed sites, but as they normally occur in very shallow water above 2m, were not surveyed. *L. digitata* was also recorded in the sublittoral fringe at Site 48 in Loch Shildaig.

At Sites 29, 30 & 31, the three exposed sites in the Inner Sound outside the south entrance to Loch Torridon, mixed kelps (*L. hyperborea*, *L. saccharina* and *Saccorhiza polyschides*) were present on scoured boulders and bedrock at 6-10m (MIR.SedK XKScrR). The boulder surfaces were covered with encrusting coralline, dark red, and brown algae, with *Aglaozonia*, *Pterosiphonia parasitica* and sparse foliose red algae. Kelp stipes were heavily colonised by red algae in shallower water, but were more grazed by urchins at 10m. Mixed kelp forests and park were also found further inside the loch system, particularly where the seabed was of boulders in sediments. Kelp covered in abundant featherstars (*Antedon bifida*), a particular feature of Loch Torridon noted in previous surveys (Scott 2000), was again noted for several sites.



Young common starfish *Asterias rubens* on infralittoral scoured boulders with encrusting coralline, red and brown algae, and *Aglaozonia*. Site 29, Inner Sound. [Photo No: 01.123.07, S.Scott]

At Site 46, a sheltered site on the Ardheslaig peninsula, infralittoral boulders at 8-11m had many ascidians *Asciella aspersa*. Because of the shallow depth, this has been included in infralittoral rock biotopes, but was essentially an upward extension of the sheltered circalittoral ascidian biotope at this site.

5.2.2. Rocky circalittoral biotopes

Below the lower limit of kelp, a relatively small range of rock biotopes was encountered, typical of sheltered sealoch situations. Circalittoral rock was surveyed at relatively few places, mainly because many rock sites ended in sediment at fairly shallow depths. At many sites it was difficult to define the infralittoral/circalittoral boundary, because of steep rock topography, mixed substrata or urchin grazing.

Circalittoral boulders at the moderately exposed Sites 32 and 34 in outer Loch Torridon were urchin-grazed, with coralline algal crusts, keelworms *Pomatoceros*

triqueter, cup corals *Caryophyllia smithii*, and ascidians. Squat lobsters were common beneath the boulders.

More sheltered circalittoral rock was surveyed at sites within Loch Shildaig (Site 41, 44, & 46). At Site 41, steep silted rock at 30-34m had abundant brachiopods *Neocrania anomala*, with fine hydroids, encrusting coralline algae and barnacles, but no *Protanthea simplex* anemones (?SCR.BrAs NeoPro). In shallower water from 12-21m, boulders in mixed sediments were silty with featherstars (*Antedon bifida* and *A. petasus*), ascidians, encrusting coralline algae and barnacles. Ascidians dominated boulders in sediments from 11-19m at Site 46. At Site 44, steep and vertical rock at 33.5m appeared to continue much further down, and would be worth surveying deeper.



Silted circalittoral bedrock with the brachiopod *Neocrania anomala*, young featherstar *Antedon bifida*, encrusting coralline algae and keelworms *Pomatoceros triqueter*. Site 41, Loch Shildaig. [Photo No: 01.1254.07, S.Scott]

5.2.3. Sediment biotopes

Sediments were found at many of the survey sites, often as mixed materials with boulders or bedrock outcrops. As noted on previous surveys, increasing amounts of silt and mud were in sediments towards the more sheltered inner parts, and with increasing depth.

At the most exposed outer sites 29, 30 and 31, clean sand and shell gravel (IGS) formed patches between boulders, or more extensive plateaus, often with dead razor (*Ensis* sp) shells, and sparse maerl.

Maerl was also found, in an extensive bed, at the head of Upper Loch Torridon (IMX.MrlMx Phy). This bed had been found by SNH ROV surveys, but not by the previous SEASEARCH survey. However the beds found on this SEASEARCH were shallower than reported by ROV survey, with the densest maerl reported between 1-5m, from the centre to south of the loch head. The beds were in fact found by hanging over the side of the boat with snorkel and mask, and on diving them it was found that areas of dense sugar kelp *L. saccharina* were also growing on top of maerl. The maerl appeared to be a dense, but often single layer of rounded, much-branched nodules overlying firm muddy sediment, with frequent horse mussels *Modiolus modiolus*, and was a very different form of maerl to the flat 'medallions' and twiglets found in the

coarser, mobile, outer loch sediments. The maerl nodules were inhabited by many small urchins *Psammechinus miliaris*, terebellid worms, scale worms, brittlestars, turban top shells *Gibbula magus*, and a variety of other animals. Abundant brittlestars *Ophiothrix fragilis* were spawning on top of the kelp.



Nodule of maerl, *Phymatolithon calcareum*. Site 52, Upper Loch Torridon. [Photo No: 01.126.08, S.Scott]



Young swimming crab *Liocarcinus depurator* in maerl *Phymatolithon calcareum*. Site 52, Upper Loch Torridon. [Photo No: 01.126.27, S.Scott]

In outer Loch Torridon and Loch Shildaig, mixed sediments with algae, hermits, spider crabs, burrowing anemones *Cerianthus lloydii* and other typical sediment epifauna was often found in shallower water, while in deeper areas scallops *Pecten maximus*, tower shells *Turitella communis* and sea pens *Virgularia mirabilis* were frequent in muddier sediments, with long-clawed squat lobsters *Munida rugosa* living in holes excavated from sediment under boulders.



Burrowing brittlestars *Amphiura filiformis* and brittlestars *Ophiura albida* in circalittoral soft mud. Site 40, Loch Diabaig. [Photo No: 01.127.13, S.Scott]

In deeper water in Loch Diabaig, the seabed of soft mud had typical communities of seapens *Pennatula phosphorea*, giant seapens *Funiculina quadrangularis*, burrowing crustaceans and burrowing brittlestars *Amphiura* sp, together with the giant naked foraminiferan *Toxosarcon alba* (see below).

As noted by the previous SEASEARCH survey, the lack of fishing by mobile bottom gear has probably contributed greatly in conserving the diversity of sediment communities in Loch Torridon.

5.3. Interesting species

The number of species recorded by SEASEARCH is relatively low, reflecting the type of survey which concentrated on habitats and mainly prominent, easily identifiable animals. There was also very little time on this survey for identification of collected specimens. Two species are worthy of note:

Skate, *Raja batis*: A ‘giant’ skate was a memorable sighting for divers at Site 37, on Loch Diabaig sill. The fish was estimated to be around 1.8m long. Loch Torridon is well-known locally for sightings in summer of large skate, a species which is virtually

extinct in other areas of Britain subjected to heavy bottom trawling, such as the North Sea.

Foraminiferan, *Toxosarcon alba*: As on the previous SEASEARCH, giant naked foraminiferans were found in muddy sediments (Sites 40 & 41). Noted from other sealochs by the MNCR, these strange organisms are small white fungus-like branched masses up to 5cm across (see photo) with an outer organised network or 'pepperpot' of sand grains. Biologists at the Dunstaffnage Marine Laboratory have concluded that they are giant foraminiferans, and the organisms found in Scottish sealochs have recently been named *Toxosarcon alba* (Tom Wilding, pers. com.).



Giant naked foraminiferan *Toxosarcon alba* in circalittoral muddy mixed sediment. Body about 2cm across. Site 40, Loch Diabaig. [Photo No: 01.127.01, S.Scott]

6. REFERENCES

Connor, D W (*co-ordinator*), Dalkin, M J, Hill, T O, Holt, R H F and Sanderson, W G (1997). Marine Nature Conservation Review: marine biotope classification for Britain and Ireland. Volume 2. Sublittoral biotopes. Version 97.06. *JNCC Report No.230*.

Howson, C M and Picton, B E *eds* 1997. The species directory of the marine fauna and flora of the British Isles. *Marine Conservation Society*.

McHattie, A (1999). West Coast Sea Loch Study. The Importance of Loch Torridon to the Local Community. *A report prepared for the Minch Project*.

Scott, S (2000). Torridon 2000 SEASEARCH. Report of a SEASEARCH survey in Loch Torridon, Wester Ross, August 18th-20th 2000. *A report to the Minch Project*.

Scott, S (in prep). Loch Torridon: a guide to underwater life and places (working title). *Produced for the Loch Torridon Project*.

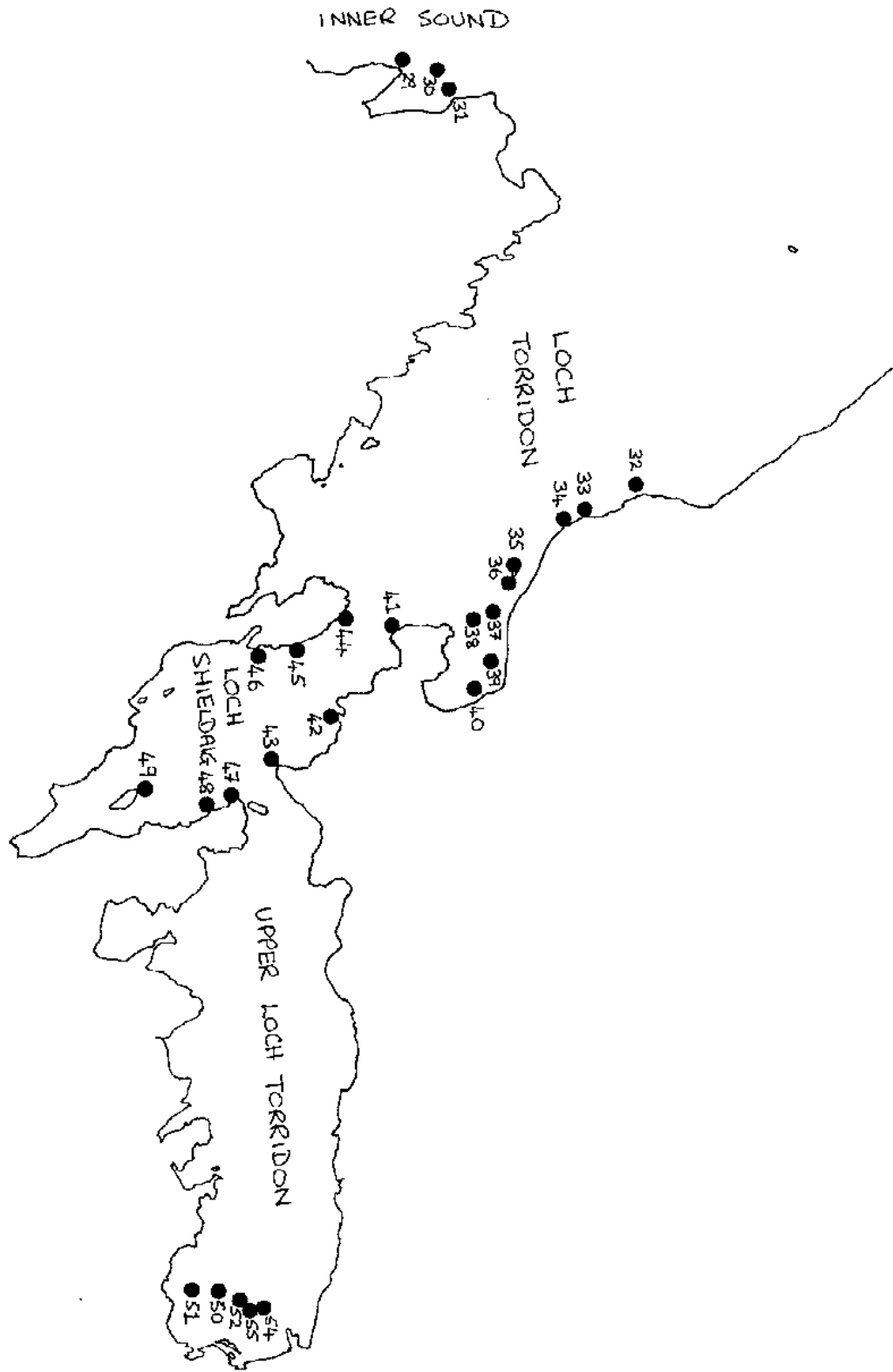
Scottish Natural Heritage (1995). SEASEARCH starter pack. ISBN 1 85397 121 9

Smith, S M (1985). A survey of the shores and shallow sublittoral of Loch Torridon and Loch Carron (including Loch Kishorn). *A report to the Nature Conservancy Council*.

7. ACKNOWLEDGEMENTS

Much work always goes on behind the scenes to organise a diving survey, and I am grateful to the survey organisers and dive team (see front cover) for their hard work. Jim Bromham deserves special thanks for much hard work transporting cylinders and people for the whole weekend, despite being unable to dive himself. SNH provided part funding for the SEASEARCH survey, and information from ROV surveys on potential dive sites.

Figure 1. Sites surveyed by Torridon 2001 SEASEARCH. For site names and positions see Appendix I.



APPENDIX I

List of sites surveyed by Torridon 2001 SEASEARCH

Site numbering is a continuation of that used in the Torridon 2000 SEASEARCH report (Scott 2000). Most site positions were taken by GPS; those marked (C) are taken from Admiralty chart no: 2210. * indicates an approximate position.

Site No	Site name	Position Lat/Long (source – chart, GPS)	Date	Divers	Dive time (mins)	Depths (m) BCD
29	Rubha Chuaig	57°33.95'0N, 05°50.82'W(C)	16.06.01	SK/SS	33	6.1-9.6
30	W of Eilean Chuaig	57°34.11'N, 05°50.81'W(C)	16.06.01	EW/LP/AM	37	9.6
31	NE of Eilean Chuaig	57°34.214'N, 05°50.797'W	16.06.01	JB/JB	34	3.6-12.1
32	S of Craig River 1	57°35.692'N, 05°44.240'W	16.06.01	CD/JD	37	1.5-18.2
33	S of Craig River 2	57°35.183'N, 05°43.853'W	16.06.01	KC/SC	40	6.8-17.3
34	S of Craig River 3	*57°35.17'N, 05°44.15'W(C)	16.06.01	JB/DS	21	0-20.3
35	W of Sgeir Dughall	57°34.745'N, 05°43.200'W	16.06.01	EW/LP/AM	29	0-11
36	E of Sgeir Dughall	57°34.75'N, 05°42.90'W (C)	16.06.01	CD/JD	37	+1.1-11.3
37	Loch Diabaig Sill (C)	?	16.06.01	SC/KC	?	?
38	Loch Diabaig Sill (N)	57°34.463'N, 05°42.296'W	16.06.01	JB/JB	34	10.9-16.6
39	NE Loch Diabaig	57°34.60'N, 05°41.53'W (C)	16.06.01	SS/SK/CD	19	10-26
40	Diabaig Jetty	57°34.47'N, 05°41.20'W (C)	18.06.01	CD/SS/JW	50	3.2-32.4
41	Mas Diabaig	57°33.735'N, 05°42.131'W	17.06.01	SS/AM	50	11.3-32.3
42	W of Port Laire	57°33.600'N, 05°41.542'W	17.06.01	SK/JB/JB	39	0-19.4
43	Rubha na h-Airde Glaise	57°30.760'N, 05°40.214'W	17.06.01	JB/DS	24	8.3-22.3
44	NE Ardheslaig	57°33.178'N, 05°42.070'W	17.06.01	SC/KC	29	1.4-33.5
45	E Ardheslaig	57°32.937'N, 05°41.890'W	17.06.01	CD/JD/CW	38	4.3-30.3
46	SE Ardheslaig	57°32.72'N, 05°41.76'W (C)	17.06.01	LP/EW	31	4.3-26.3
47	NW of Camas Ruadh	57°31.518'N, 05°39.948'W	15.06.01	AM/CW	30	0-25.8
48	SW of Camas Ruadh	57°31.449'N, 05°39.847'W	15.06.01	CD/JD	39	+3.7-8.3
49	N of Shieldaig Island	57°31.70'N, 05°39.50W (C)	15.06.01	JB/KC	33	+1.0-7.3
50	Head of Loch Torridon South 1	57°32.305'N, 05°31.959'W	17.06.01	SC/KC	37	0.7-1.2
51	Head of Loch Torridon South 2	57°32.071'N, 05°32.055'W	17.06.01	JB/SK	37	0.5-1.5
52	Head of Loch Torridon Middle 1	57°32.455'N, 05°31.906'W	17.06.01	SS/CW	45	1-2
53	Head of Loch Torridon Middle 2	?	17.06.01	CD/JD	43	1-2
54	Head of Loch Torridon North 1	57°32.556'N, 05°31.716'W	17.06.01	LP/EW	36	3
55	Head of Loch Torridon North 2	57°32.609'N, 05°31.695'W	17.06.01	DS/JS	20	3.5

APPENDIX II

Biotores recorded by Torridon 2001 SEASEARCH

As far as possible, biotope codes follow those in Connor et al (1997). Depths are in metres below Chart Datum.

Biotope code		Biotope title	Sites & depth	Substratum & features	Depth range
MLR.BF	Fser	<i>Fucus serratus</i> on moderately exposed lower eulittoral rock	48(+1.7-+0.3)	Steep bedrock	+1.7-+0.3
SLR.F	Fser.Fser	<i>Fucus serratus</i> on sheltered lower eulittoral rock	36(+1.3-+1.1)	Bedrock	+1.3-+01.1
EIR	AlaLdig	<i>Alaria esculenta</i> and <i>Laminaria digitata</i> on exposed sublittoral fringe bedrock	?32(1.6)	Boulders	1.6
MIR		Moderately exposed infralittoral rock	?33(8.5-17.3)	Scattered boulders on sand	8.5-17.3
MIR.K		Moderately exposed infralittoral rock with kelp & red seaweeds	33(8.5), 34(0-9.7)	Boulders	0-9.7
MIR.K	Ldig	<i>Laminaria digitata</i> on moderately exposed or tideswept sublittoral fringe rock	48(+0.3-0.7)	Boulder slope	+0.3-0.7
MIR.K	Lhyp.Ft	<i>Laminaria hyperborea</i> forest on moderately exposed upper infralittoral rock	35(0-6),	Boulders	0-6
MIR.K	Lhyp.Pk	<i>Laminaria hyperborea</i> park on moderately exposed lower infralittoral rock	35(6-11)	Silty bedrock	6-11
MIR.K	Lsac.Ft	<i>Laminaria saccharina</i> forest on moderately exposed upper infralittoral rock	32(4-12.3), 48(+0.3-6.3)	Boulders, steep boulder slope	+0.3-12.3
MIR.K	LsacSac.Ft	Mixed <i>Laminaria saccharina</i> and <i>Saccorhiza</i> forest on moderately exposed upper infralittoral rock	32(1.6-4)	Boulders	1.6-4
MIR.SedK	XKScrR	Mixed kelps with scour-tolerant and opportunistic foliose red seaweeds on scoured or sand-covered infralittoral rock	29(6.1-9.6), 30(9.6), 31(5.6)	Scoured boulders, pebbles & coarse sediments	5.6-9.6
MIR.GzFa		Grazed fauna on moderately exposed infralittoral rocks	48(4.3-5.3)	Large urchin-grazed boulders	4.3-5.3
SIR		Sheltered infralittoral rock	38(10.9- ?), 45(4.3-8.3), 47(6.8-12.8)	Steep rock face & slope,	4.3-12.8

Biotope code	Biotope title	Sites & depth	Substratum & features	Depth range
			boulders	
SIR.K		Kelp on sheltered infralittoral rock	Large boulders	0-12.1
SIR.K	Lhyp.Ft	<i>Laminaria hyerborea</i> forest on sheltered infralittoral rock	Boulders	0-4.3
SIR.K	Lhyp.Pk	<i>Laminaria hyerborea</i> park on sheltered infralittoral rock	Boulders	4.3-8.3
SIR.K	LhypLsac.Ft	Mixed <i>Laminaria hyperborea</i> and <i>L. saccharina</i> forest on sheltered lower infralittoral rock	Fissured bedrock	+1.1-4
SIR.K	Lsac.Ft	<i>L. saccharina</i> forest on very sheltered upper infralittoral rock	Silty bedrock, bedrock slopes, boulders	+0.2-12.3
SIR.BrAs	Aasp	<i>Ascidella aspersa</i> on sheltered infralittoral rocks	Boulders in sand & shell gravel	8.3-10.8
MCR		Moderately exposed circalittoral rock	Boulders	9.7-14.7
MCR.GzFa		Grazed fauna on moderately exposed or sheltered rock	Vertical faces of very large boulders	11.6-12.6
MCR.GzFa		Grazed fauna on moderately exposed or sheltered rock	Angular boulders with shelly gravel	12.3-16.6
SCR		Sheltered circalittoral rock	Vertical or steeply sloping bedrock, boulders	12.3-33.5
SCR.BrAs	Aasp	<i>Ascidella aspersa</i> on sheltered circalittoral rocks	Boulders in sand & shell gravel	10.8-19.3
SCR.BrAs	NeoPro	<i>Neocrania anomola</i> and <i>Protanthea simplex</i> on very sheltered circalittoral rock	Steeply sloping glaciated bedrock	24.3-32.3
IGS		Infralittoral gravel and sand	Clean sand	3-17.3
IGS.Mrl		Infralittoral gravel and sand with maerl	Flat sandy seabed	10.9
CGS		Circalittoral gravel and sand	Coarse sand & shell gravel	12.8-24.8
CMU	SpMeg.Fun	Seapens and burrowing megafauna in circalittoral soft mud	Gentle slopes & plains of soft mud	23-32.4
IMX		Infralittoral mixed sediments	Mixed sediments, shells and boulders	3.2-18.4

IMX.KSwMx	LsacX	<i>Laminaria saccharina</i> , <i>Chorda filum</i> and filamentous red seaweeds on sheltered infralittoral sediment	36(6.3)	Shelly gravel, loose-lying algae & ascidians	6.3
IMX.MrlMx	Phy	<i>Phymatolithon calcareum</i> maerl beds on muddy mixed sediments	50(4.5-5), 51(0.5- 1.5), 52(1-2), 53(1- 2), 54(3), 55(3.5)	Mixed muddy sediments with maerl, often dense	0.5-5
CMX		Circalittoral mixed sediments	32(18.1), 34(14.7- 20.7), 39(10-23), 40(18.4-26.8), 41(12.3-21.3), 42(12.1-16.4), 45(25), 46(19.3- 26.3)	Muddy mixed sediments, scattered shells and boulders	10-26.8

APPENDIX III

Biotores recorded at each site by Torridon 2001 SEASEARCH

Biotope codes follow those in Connor et al (1997). Biotores marked ? could not be assigned a code with certainty because of lack of information, or because they did not fit any of the limited biotope descriptions in Connor et al (1997). Depths are in metres below Chart Datum

Site No	Biotope		Depth	Substratum & features
29	MIR.SedK	XKScrR	6.1-9.6	Scoured boulders, pebbles & shell gravel, kelp
30	MIR.SedK	XKScrR	9.6	Boulders, cobbles & coarse sand
31	MIR.SedK	XKScrR	5.6	Boulders & dense kelp
31	IGS.Mrl		10.9	Flat sandy seabed with <i>Ensis</i> , maerl & foliose algae
32	EIR	?Ala.Ldig	1.6	Boulders with kelp & <i>Alaria</i>
32	MIR.K	Lsac.SacFt	1.6-4	Boulders with <i>L.saccharina</i> / <i>Saccorhiza</i> forest
32	MIR.K	L.sacFt	4-12.3	Boulders with dense <i>L.saccharina</i>
32	MCR.GzFa		11.6-12.6	Very large boulders with vertical sides & keelworms
32	MCR.GzFa		12.3-16.6	Angular boulders with shelly gravel
32	CMX		18.1	Gradual slope of shelly mud
33	?IMX ?MIR		8.5-17.3	Scattered boulders on sand
33	?IGS		8.5-17.3	Plateau of clean sand
34	MIR.K		0-6.7	Kelp
34	MIR.K		6.7-9.7	Boulders & kelp
34	MCR		9.7-14.7	Boulders & squat lobsters
34	?CMX		14.7-20.7	shell gravel with <i>Virgularia</i> , scallops & brittlestars
35	MIR.K	Lhyp.Ft	0-6	Boulders with dense kelp & featherstars
35	MIR.K	Lhyp.Pk	6-11	Steep silty bedrock slope
35	?IMX		11	Boulders & coarse sediment
36	SLR.F	Fser.Fser	+1.3-+1.1	Bedrock with <i>F.serratus</i> , <i>Ulva</i> & <i>Palmaria</i>
36	SIR.K	LhypLsacFt	+1.1-4	Fissured bedrock with <i>L.hyperborea</i> forest
36	SIR.K	LsacFt	4-6.9	Silty bedrock slope with <i>L.saccharina</i> forest
36	IMX.KSwMx	LsacX	6.3	Shelly gravel with loose-lying algae & ascidians
37	?		?	Rock & boulder plateau & slope
37	?		?	Sandy bottom, very silty
38	SIR		10.9	Steep rock face with abundant brittlestars (?featherstars)
38	?IMX ?SIR			Sandy bottom with boulders
38	?SIR ?SCR			Rock slope with some sand
38	?CGS		?16.6	Sand with occasional boulders
39	CMX		10-23	Muddy mixed sediments
39	CMU	?SpMeg.Fun	23-25	Mud with seapens & burrowing brittlestars
40	IMX		3.2-9.4	Gently sloping shelly mud
40	IMX		4-18.4	Slope of muddy gravel & scattered boulders
40	CMX		18.4-26.8	Muddy gravel slope
40	CMU	?SpMeg.Fun	26.8-32.4	Soft mud with seapens, <i>Nephrops</i> burrows & burrowing brittlestars
41	IMX		7.3-12.3	Muddy shell gravel & boulders with cape kelp
41	CMX		12.3-21.3	Muddy shell gravel & silty boulders with featherstars
41	SCR.BrAs	?NeoPro	24.3-32.3	Steeply sloping glaciated bedrock with <i>Neocrania</i>
42	SIR.K		0-8.9	Very large boulders
42	SIR.K/?IMX		8.9-12.1	Large boulders & areas of sand & shell
42	?CMX		12.1-16.4	Large boulders & areas of sand & shell
42	?CGS		16.4-19.4	Sand & shell gravel

Site No	Biotope		Depth	Substratum & features
43	?		8.3-22.3	Boulders, sand & gravel in varying amounts
44	SIR.K	LsacFt	8.3-9.7	Bedrock slope with sugar kelp forest
44	SCR		18.7-31.8	Vertical bedrock with sparse life
44	SCR		32.7-33.5	Steeply sloping bedrock & shelf
45	IMX, SIR		4.3-8.3	Coarse flat sand with occasional kelp-covered boulder
45	SIR.K	Lsac.Ft	8.3-12.3	Slope of large boulders with <i>L.saccharina</i> forest
45	CMX, SCR		12.3-25	Boulders & coarse sand slope
45	CMX		25	Coarse sand & shell fragments, scattered boulders
46	SIR.K	?Lhyp.Ft	0-4.3	Boulders with dense kelp
46	SIR.K	?Lhyp.Pk	4.3-8.3	Boulders with sparse kelp
46	SIR.BrAs	Aasp	8.3-10.8	Boulders with ascidians, in sand & shell gravel
46	SCR.BrAs	Aasp	10.8-19.3	Sand & shell gravel, some boulders with ascidians
46	CMX		19.3-26.3	Sand & shell gravel with seapens & burrowing anemones
47	SIR.K	Lsac.Ft	+0.2-6.8	Steep bedrock & angular boulders with <i>L.saccharina</i> forest
47	SIR		6.8-12.8	Steep bedrock & large angular boulders
47	CGS		12.8-24.8	Coarse sand slope
48	MLR.BF	Fser	+1.7-+0.3	Steep bedrock with barnacles & <i>F.serratus</i>
48	MIR.K	Ldig	+0.3-0.7	Steep boulder slope with <i>L.digitata</i>
48	MIR.K	LsacFt	+0.3-6.3	Steep boulder slope with <i>L.saccharina</i> forest
48	MIR.GzFa		4.3-5.3	Large urchin-grazed boulders
48	IMX		8.3	Flat shelly gravel
49	SIR.K	LsacFt	1-3	Boulders with <i>L.saccharina</i>
49	SIR.K, ?IGS		3-7	Flat sand with large boulders & kelp
50	IMX.MrlMx	Phy	4.5-5	Maerl bed with dense <i>L.saccharina</i>
51	IMX.MrlMx	Phy	0.5-1.5	Maerl bed with varying amounts of maerl
52	IMX.MrlMx	Phy	1-2	Dense maerl & dense <i>L.saccharina</i>
53	IMX.MrlMx	Phy	1-2	Dense maerl & dense <i>L.saccharina</i>
54	IMX.MrlMx	Phy	3	65% maerl & sparse <i>L.saccharina</i>
55	IMX.MrlMx	Phy	3.5	Patchy maerl & kelp

APPENDIX IV

Species recorded by Torridon 2001 SEASEARCH

Nomenclature follows that in Howson & Picton (1997); sites are located on Figure 1.

SPECIES	
RHODOPHYCOTA	
<i>Porphyropsis coccinea</i>	29
<i>Porphyra</i> sp	45
<i>Bonnemaisonia asparagoides</i>	29,41
Trailliella	39
<i>Palmaria palmata</i>	36
<i>Kallymenia reniformis</i>	29
Encrusting corallines	29,30,31,32,34,35,36,38,41,45,48
Maerl	31,50,51,52,53,54,55
<i>Chondrus crispus</i>	31
<i>Plocamium cartilagineum</i>	29,32,36,41
<i>Lomentaria clavellosa</i>	29
<i>Ceramium</i> sp	31
<i>Apoglossum ruscifolium</i>	29
<i>Cryptopleura ramosa</i>	29,41
<i>Delesseria sanguinea</i>	32,36,40,45
<i>Nitophyllum punctatum</i>	31,41
<i>Phycodrys rubens</i>	29,39,41
<i>Brongniartella byssoides</i>	29
<i>Pterosiphonia parasitica</i>	29
Encrusting dark red	29,32
CHROMOPHYCOTA	
<i>Cutleria multifida</i> (<i>Aglaozonia</i>)	29,41
<i>Dictyota dichotoma</i>	29
<i>Desmarestia aculeata</i>	29
<i>Desmarestia viridis</i>	41
<i>Desmarestia</i> sp	30,33,35,37,44,46,48,49
<i>Laminaria digitata</i>	?34,?38,48
<i>Laminaria hyperborea</i>	29,30,32,35,36,41,46
<i>Laminaria saccharina</i>	29,30,32,33,35,36,37,38,40,41,44,45,47,48,49,50,51,52,53,54,55
<i>Saccorhiza polyschides</i>	29,32
<i>Alaria esculenta</i>	32
<i>Fucus serratus</i>	35,48
<i>Fucus vesiculosus</i>	54
Filamentous brown	32,36,41,48
Encrusting brown	29,41
CHLOROPHYCOTA	
<i>Enteromorpha</i> sp	45,48
<i>Ulva</i> sp	31,34,35,36,40,45,46,48
FORAMINIFERA	
<i>Toxosarcon alba</i>	40,41
PORIFERA	
<i>Cliona celata</i>	41
Porifera indet	36,45

SPECIES	
CNIDARIA	
<i>Haliclystus auricula</i>	29
<i>Hydractinia echinata</i>	53
<i>Halecium</i> sp	?41
<i>Obelia geniculata</i>	29,30,32,35,36,41,45,46,48,52,53
<i>Obelia</i> sp	?32
Hydroidea indet	46,50
<i>Alcyonium digitatum</i>	30,35,38,44
<i>Funiculina quadrangularis</i>	39,40
<i>Virgularia mirabilis</i>	34,39,41,42,45
<i>Pennatula phosphorea</i>	39,40
Sea pen indet	43,47
<i>Cerianthus lloydii</i>	31,32,?33,39,43,46,47
<i>Urticina felina</i>	30,44
<i>Metridium senile</i>	35
Anemone indet	31
<i>Caryophyllia smithii</i>	32
NEMERTEA	
<i>Lineus longissimus</i>	41
ANNELIDA	
Scale worm indet	52,53
<i>Chaetopterus variopedatus</i>	35,46
<i>Arenicola marina</i>	33,42
Terebellidae indet	52,53
<i>Amphitrite</i> sp	32
<i>Eupolymnia nebulosa</i>	51
<i>Lanice conchilega</i>	41,42,45,47,48
<i>Sabella pavonina</i>	51
<i>Pomatoceros triqueter</i>	32,35,36,38,45,47,48
Serpulidae indet	53,54
Spirorbidae indet	48
CHELICERATA	
Pycnogonida indet	33
CRUSTACEA	
<i>Semibalanus balanoides</i>	36,48
<i>Balanus crenatus</i>	36,40
Cirripedia indet	32,35,41,45
Mysidae indet	29,52
Amphipoda indet	29,30
Caridea indet	30,36,42,48,53,54
<i>Nephrops norvegicus</i> (burrows)	?40,?47
<i>Pagurus bernhardus</i>	42,45,48,51
<i>Pagurus prideaux</i>	30
Paguridae indet	34,35,36,39,40,41,42,43,46,48,49,50,52,53,54,55
<i>Galathea strigosa</i>	30,32,37,48
<i>Galathea squamifera</i>	40
<i>Galathea</i> sp	30,34
Squat lobsters indet	35,37,38,43,47,49
<i>Munida rugosa</i>	32,33,37,41,42,43,44,45,46,48
<i>Inachus dorsettensis</i>	52,55
<i>Macropodia rostrata</i>	36,42,48,51
Spider crab indet	33,40,43,45,46,48,54
'stone crab'	31
<i>Atelecyclus rotundatus</i>	42,43,46
<i>Cancer pagurus</i> (c = in creel)	29(c), 30,31,33,34,35,37,38,39,41,42,43,44,45

SPECIES	
<i>Liocarcinus depurator</i>	37,39,40,41,45,48,52
<i>Liocarcinus</i> sp	33,37,54
<i>Necora puber</i> (c = in creel)	29(c),30,34,35,38,40,42,43,45,46,48,51
<i>Carcinus maenas</i>	39,43,51,52,55
Pea crabs	52
MOLLUSCA	
Polyplacophora indet	33,42,46,48
<i>Tectura</i> sp	29
<i>Helcion pellucidum</i>	30
<i>Gibbula magus</i>	50,52,55
<i>Gibbula cineraria</i>	29
<i>Gibbula</i> sp	30,36,48,
<i>Calliostoma ziziphinum</i>	29,30,46,54
<i>Littorina</i> sp	?54
<i>Turritella communis</i>	39,40,43,51,55
<i>Aphorrais pespelecani</i>	53
<i>Trivia</i> sp	41
<i>Nucella lapillus</i>	42
<i>Buccinum undatum</i>	52,55
<i>Philine aperta</i>	40
<i>Archidoris pseudoargus</i>	50,53,54
<i>Eubranchus exiguus</i>	41
Opisthobranchia indet	41
<i>Modiolus modiolus</i>	51,52,53,54,55
<i>Aequipecten opercularis</i>	34,39,43,46,50,51,54
<i>Pecten maximus</i>	33,34,38,41,42,43,45,47
<i>Ensis</i> sp (shells)	31,32,38,46,47,48
<i>Circomphalus casina</i>	30
BRACHIOPODA	
<i>Neocrania anomala</i>	41
BRYOZOA	
<i>Membranipora membranacea</i>	35,46
Encrusting on kelp	32,35,48
Encrusting indet	41
ECHINODERMATA	
<i>Antedon bifida</i>	29,35,36,38,41,43,44,45,46,47,51
<i>Antedon petasus</i>	41
<i>Astropecten irregularis</i>	32,42,46
<i>Luidea ciliaris</i>	30,32,34,35,36,38,39,41,42,43,45,46,49
<i>Porania pulvillus</i>	32,33,35,36,38,41,42,43,44,45,46,47
<i>Anseropoda placenta</i>	45
<i>Solaster endeca</i>	39,41,45,49
<i>Crossaster papposus</i>	35,39,40,41,43,46,49,54
<i>Henricea</i> sp	34,40,43
<i>Asterias rubens</i>	29,30,33,35,37,38,39,40,41,43,46,47,48,50,51,53,54,55
<i>Marthasterias glacialis</i>	30,33,35,37,39,41,42,45,46,47
Starfish indet	31
<i>Ophiothrix fragilis</i>	29,50,52,53
<i>Ophiocomina nigra</i>	30,50,52,53
<i>Ophiura albida</i>	32,40,41,45,48
<i>Ophiura</i> sp	29,54
<i>Amphiura filiformis</i>	39,41
Burrowing brittlestars	39,40,41
'crevice' brittlestars	45
Brittlestars indet	34,42,43,44,55

SPECIES	
<i>Psammechinus miliaris</i>	29,50,51,52,53,54,55
Echinus esculentus	29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,53
<i>Aslia lefevrei</i>	35
TUNICATA	
<i>Clavelina lepadiformis</i>	29,30,35,36,38,41,42,43,45,46,47
<i>Ciona intestinalis</i>	32,36,40,45,48
<i>Ascidella aspersa</i>	30,42,43,46
<i>Ascidia mentula</i>	32,34,41
<i>Botryllus schlosseri</i>	?32,51
Tunicata indet	37,38,52
PISCES	
<i>Scyliorhinus canicula</i>	39
<i>Raja batis</i>	37
<i>Gadus morhua</i>	32
<i>Pollachius pollachius</i>	29
<i>Pollachius virens</i>	29
<i>Trisopterus minutus</i>	41,44
<i>Syngnathus acus</i>	49,50
Gurnard indet	33
Scorpion fish indet	36,48
<i>Agonus cataphractus</i>	42,51
<i>Ctenolabrus rupestris</i>	32
<i>Pholis gunnellus</i>	35,39,52,53,55
<i>Callionymus lyra</i>	33,35,47,49,53
<i>Gobiusculus flavescens</i>	29,35,43
<i>Pomatoschistus</i> sp	29,30,36,41,42,48,51
<i>Thorogobius ephippiatus</i>	32,37,38
Gobies indet	35
<i>Pleuronectes platessa</i>	40

APPENDIX V

Catalogue of photographs taken on Torridon 2001 SEASEARCH

All photographs taken by Sue Scott.

SCENIC AND PEOPLE

01.125.27. Diving from Shialdaig slipway.

UNDERWATER

Rubha Chuaig (Site 29)

01.123.03. *Pterosiphonia parasitica*, *Aglaozonia* and encrusting red and coralline algae on scoured rocks.

01.123.03. Scoured rocks with young *Asterias rubens* on *Aglaozonia*, encrusting red and coralline algae.

01.123.12. Stalked jellyfish *Haliclystus auricula* on *Phycodrys rubens* on kelp stipe.

01.123.09. Velvet crab in creel.

NE Loch Diabaig (Site 39)

01.123.15. Burrowing brittlestars *Amphiura* sp.

01.123.16. Phytoplankton 'snot' floating in water.

Diabaig Jetty (Site 40)

01.127.09. Sea pen *Pennatula phosphorea* with phytoplankton on tentacles.

01.127.13. Brittlestars *Ophiura albida* and burrowing brittlestars *Amphiura filiformis*.

01.127.15. Scorpion spider crab *Inachus dorsettensis*.

Mas Diabaig (Site 41)

01.125.04. Young featherstar *Antedon bifida*.

01.125.07. Brachiopod *Neocrania anomala*, with shell open.

01.125.11. Northern sunstar *Solaster endeca*.

01.125.15. Featherstar *Antedon petasus*.

01.125.21. Featherstars *Antedon bifida*.

01.125.17. Boring sponge *Cliona celata*.

Head of Loch Torridon, Middle 1 (Site 52)

01.126.01. Turban top shell *Gibbula magus* in maerl bed.

01.126.02. maerl bed *Phymatolithon calcareum*.

01.126.03. maerl bed *Phymatolithon calcareum*.

01.126.08. maerl *Phymatolithon calcareum*.

01.126.11. Decorator crab *Hyas/Inachus* sp in maerl bed

01.126.13. Sugar kelp *Laminaria saccharina* holdfast with maerl *Phymatolithon calcareum*.

01.126.14. Sugar kelp *Laminaria saccharina* holdfast with maerl *Phymatolithon calcareum*.

01.126.17. Butterfish *Pholis gunnellus* in maerl

- 01.126.21. Sugar kelp *Laminaria saccharina* holdfast with maerl and urchins
Psammechinus miliaris.
- 01.126.22. Dense maerl *Phymatolithon calcareum* & brittlestar *Ophiothrix fragilis*.
- 01.126.26. Sugar kelp *Laminaria saccharina* holdfast with black brittlestar
Ophiocolina nigra and juvenile urchins *Psammechinus miliaris*.
- 01.126.27. Young swimming crab *Liocarcinus depurator* in maerl bed.

APPENDIX VI

Examples of completed SEASEARCH forms used on Torridon 2001 SEASEARCH

MR MCS 007 000000 BE Smithell 4/5/5

SEASEARCH

SC1/004

SITE RECORDING FORM

Survey name: LOCH TORRIDON Date of survey: 15/6/01 (a.m.)
Site name: NW SIDE CAMAS ROAD IN LOCH TORRIDON Site number: 23 REPORT SITE 47

Site location: use one of the following:- OS grid reference; latitude/longitude; Decca:
57°31.518N 5°39.948W

Name and address of person completing this form: COLIN WISHART, 12 CANDOR RD., INVERNESS IV2 3NR

Map of area: Please insert a photocopy of a map or chart, or sketch map. Mark any rapids, areas of fast currents, offshore rocks and islands. Indicate transit marks where applicable. Please mark the dive locations on the map.



Reasons for site selection (see Guidance Notes): GAP IN SURVEY 2000 COVERAGE / POOR WEATHER

If any specimens were collected, who has them?

If any photographs were taken, who has them? n/a

Please fill in this section to the best of your knowledge:

A. Physical nature of the site.

Is the site one of the following:- Open coast; enclosed coast; lagoon; straits or narrows; shallow rapids; other? ENCLOSED COAST

Is the site:- Extremely exposed; very exposed; moderately exposed; sheltered; very sheltered; extremely sheltered? MODERATELY EXPOSED

Is the current:- very strong (6kn); strong (3-6kn); moderately strong (1-3kn); weak (less than 1kn); very weak; unknown? MODERATELY STRONG

Additional comments on the nature of the site: STEEP CLIFFS c. 50m HIGH DRIPPING INTO WATER

B. Human usage and impact at the site.

Fishing (e.g., trawling, potting, angling): n/a

Fish farming (e.g., salmon, shellfish): n/a

Extraction (e.g., of sand, gravel, oil): n/a

Waste disposal (e.g., sewage, industrial discharge): n/a

Litter: NONE

Coastal defence (e.g., groynes, sea wall, breakwater): NONE

Port or marina: NONE

Moorings: NONE Launch site: SHIELDING SLIP

Watersports: NONE Popular dive site: NO

Educational/scientific use: n/a

Your comments on the human usage of the area: MAYBE OCCASIONAL POTTING (CRABLING)

Site protection at site or on nearby shore (e.g., Site of Special Scientific Interest, owned by the National Trust): NO

C. Access.

Is access easy, difficult or very difficult? EASY

D. What is your assessment of the site, based on your experience?

1. Underwater scenery (e.g., typical, unusual, spectacular): TYPICAL

2. Range of habitats (little variety, wide variety): MODERATE VARIETY

3. Richness of marine life (sparse or dense in terms of numbers; poor or rich in terms of the variety of species): AVERAGE



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DIVE RECORDING FORM

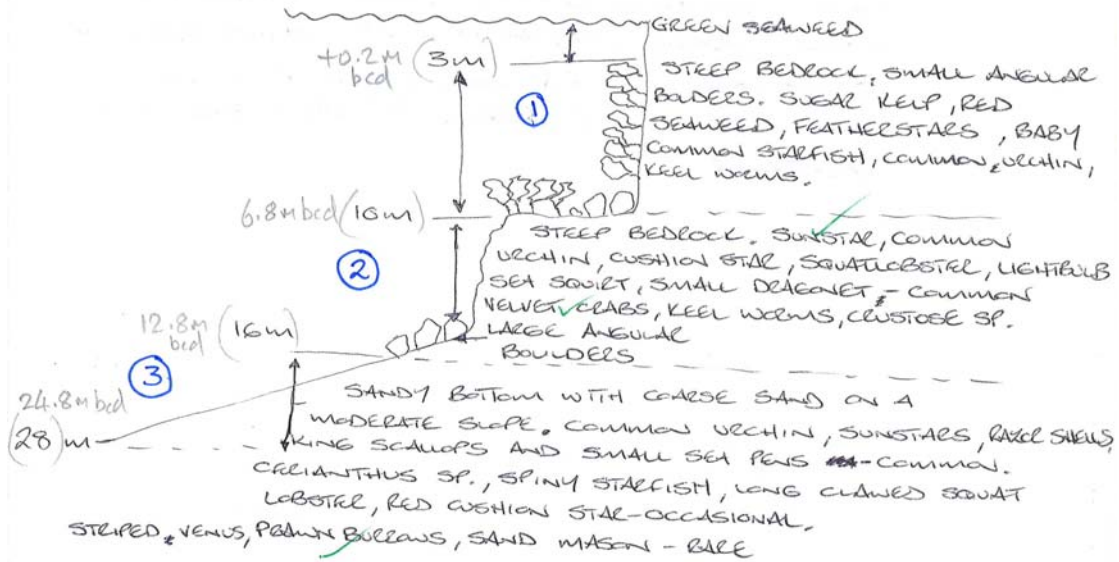
Survey name: Loch Torridon Date of dive: 15/6/01 (3m)
 Site name: NW ~~SE~~ CAMAS ~~AN~~ ^{RWADH} ~~AN~~ ^{ABH} ~~AN~~ ^{AN} ~~AN~~ ^{AN} (4.7) Site number: 23 ~~23~~
 Name and address of recorder: COIN WISHART

Site location: use one of the following: OS grid reference; latitude/longitude; Decca:
[SEE MAP ON SITE FORM] 57°31.518N 5°39.948W

Time of dive (24hr clock please): Start: 12.30 Finish: 13.00 Duration: 30 mins
ULLAPOD 2.97K
 Depth range below sea level: From: 28^{3.17}m To: SURFACE Correction 3.2m
 Depth range below chart datum (if known): From: 25.8 To: 0m
 Underwater visibility: GOOD - 10m

Sketch:

Please sketch your dive plan (map) and profile. Draw any habitats, communities or peculiar features marking depths. Indicate positions corresponding to your written habitat descriptions (see reverse side of form).



Conical 3.2 m

(47)

Dive Description:

Describe the following four points for each habitat you wish to describe. Try to use terms in the Guidance Notes. Please start with the shallowest (where applicable); number your habitats and indicate their positions on the sketch map and profile.

1. **Sea floor type** (substratum). 2. **Depth** (range) of each habitat. 3. **Communities** (describe conspicuous species and those which are most numerous; what is the general appearance of the community?). 4. **Any special features** that might influence the community (e.g., silt, urchin grazing).

SIR.K
LSacFt (1) STEEP BEDROCK GIVING WAY TO SMALL ANGULAR Boulders. ^{+0.2 - 6.8m} (3m - 10m). SUGAR Kelp & RED SEAWEED IN ABUNDANCE. FEATHERSTARS, COMMON SEA URCHIN, BABY COMMON STARFISH & KEEL WORMS common.

SIR/SCR (2) STEEP BEDROCK GIVING WAY TO LARGE ANGULAR Boulders. ^{6.8 - 12.8m} (10m - 16m). COMMON URCHIN, RED CUSHION STARS, JUVENILE COMMON STARFISH, SQUATLOBSTER, SMALL DRAGONETS, KEEL WORMS, PURPLE CRUST, LIGHTBULB SEA BOWTIE IN ABUNDANCE.

CGS (3) COARSE SAND ON A MODERATE SLOPE. ^{12.8 - 24.8m} (16m - 28m). COMMON URCHIN, PURPLE SUNSTARS, KING SCALLOPS, SMALL SEA PENS common. RED CUSHION STAR, ^{Legelawia from figure} SQUAT LOBSTER, CERIANTHUS SP., SPINY STARFISH OCCASIONAL. ^{VENUS from KS} STRIPED ^{VENUS from KS} WORMS, SCAMPI TAILS, SAND WORM RARE. DEBRIS OF RAZOR SHELLS IN ABUNDANCE.



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