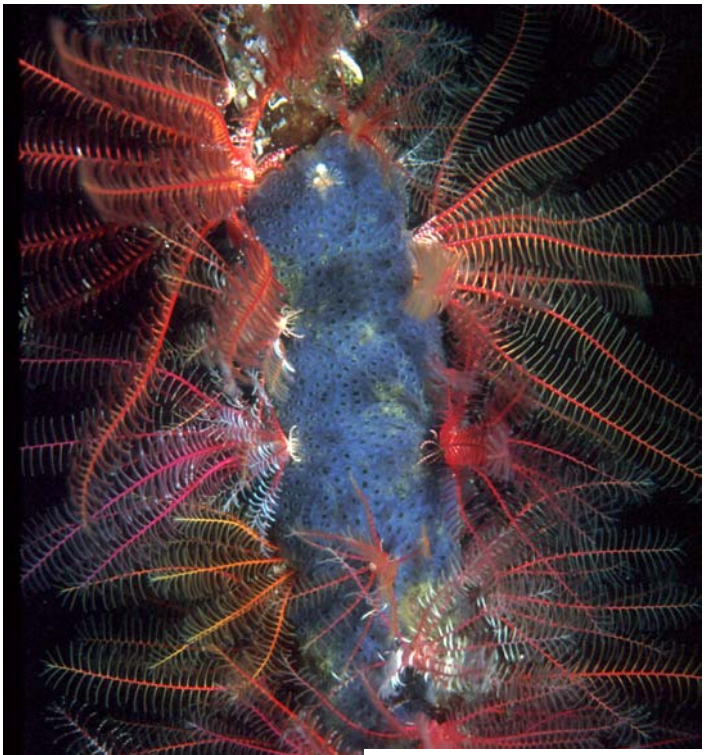

featherstars and seasquirts on kelp

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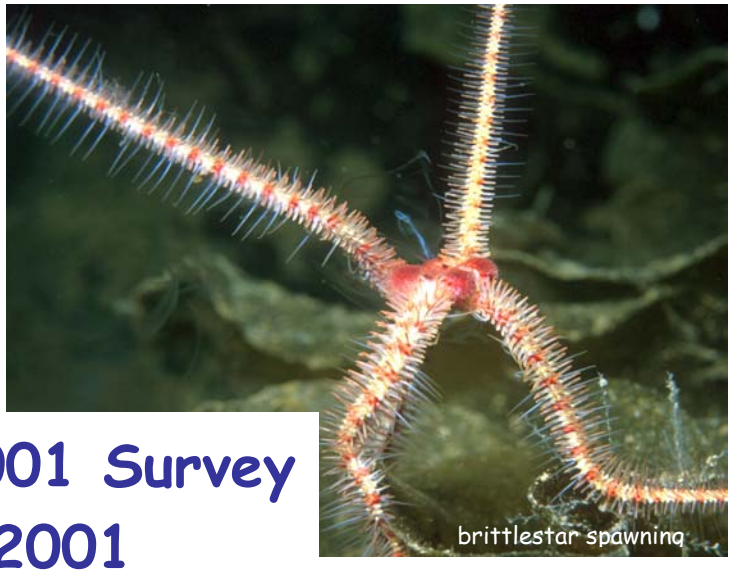

brittlestar spawning

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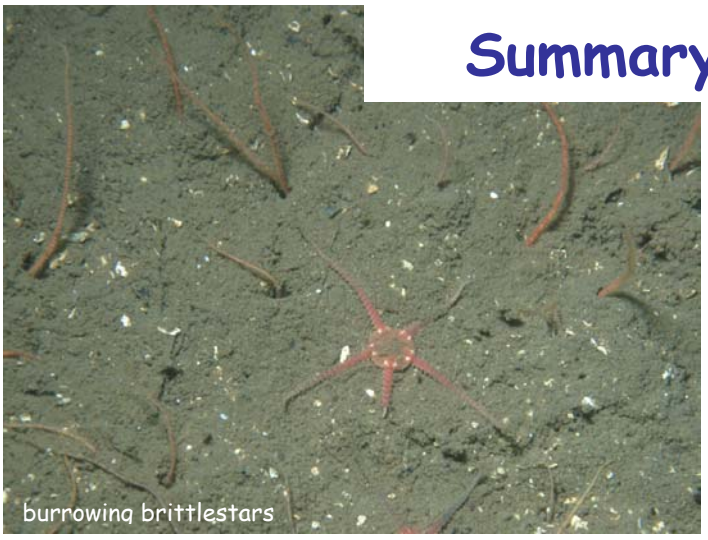
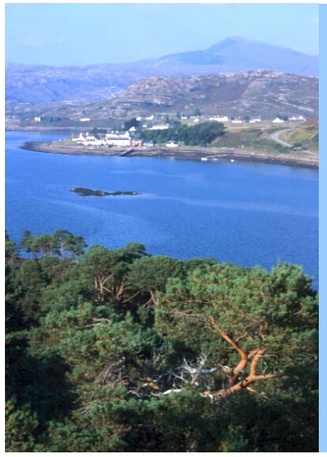


burrowing brittlestars

sea pen *Pennatula phosphorea*

featherstars *Antedon petasus* and *A. bifida*

butterfish in maerl

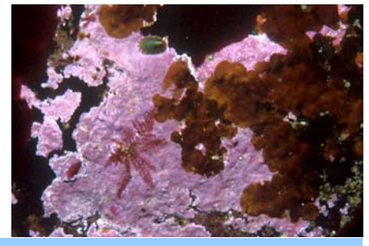


Loch Torridon

Loch Torridon is a fjordic loch complex of three large and several smaller basins, separated by shallower narrows, on the north-west coast of Scotland. In the Inner Sound nearby are the deepest inshore seabeds in Britain, at over 300m, while the three main basins in the loch complex reach 90m or more. Seasearch forms were returned for 27 sites in total, ranging from the Inner Sound to the head of Upper Loch Torridon, a distance of around 20km. Sites were planned to continue coverage from a previous survey in 2000, and to look in more detail at an extensive maerl bed (previously identified by Scottish Natural Heritage ROV surveys) at the head of Upper Loch Torridon.

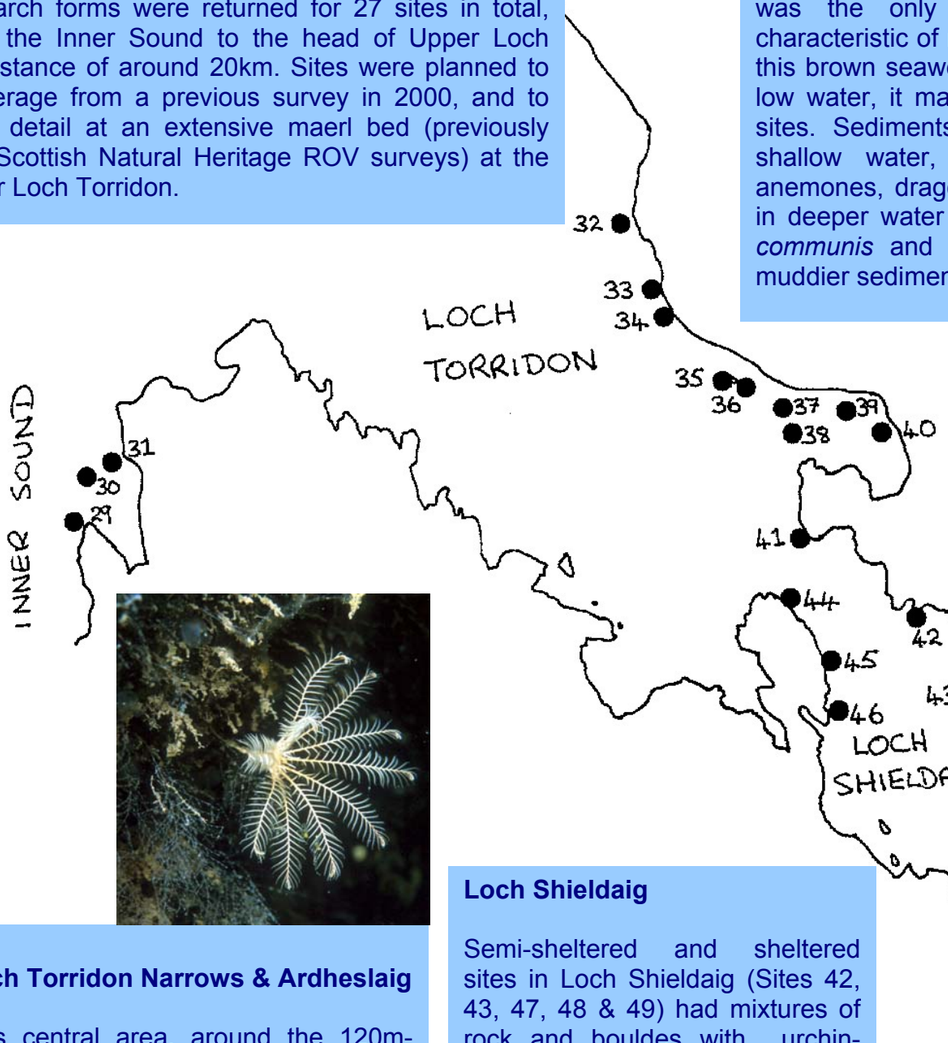
Loch Torridon north side

Sites 32-36 on the north side of Loch Torridon were semi-exposed sites of bedrock or boulder slopes ending in coarse sediments. Rocks were generally urchin-grazed, with mixed kelp forests in shallow water. Beneath the kelp rock surfaces were pink with coralline crusts, with keelworms and solitary seasquirts. Site 32 was the only place where dabberlocks *Alaria esculenta*, characteristic of more exposed coasts, was recorded. However as this brown seaweed usually occurs only in a narrow band around low water, it may have been missed by deeper survey at other sites. Sediments typically had algae on shells and stones in shallow water, with hermit crabs, spider crabs, burrowing anemones, dragonets and other typical sediment epifauna, while in deeper water scallops *Pecten maximus*, tower shells *Turitella communis* and sea pens *Virgularia mirabilis* were frequent in muddier sediments.



Inner Sound

Sites 29, 30 and 31 in the Inner Sound were relatively exposed, with rocks and boulders scoured by surrounding sediments. In shallow water above 10m, cuvie (*Laminaria hyperborea*), sugar kelp (*L. saccharina*) and furbelows (*Saccorhiza polyschides*) formed a mixed kelp forest. Kelp stipes were covered with dense red algae in very shallow water, but were urchin-grazed at 10m. The stalked jellyfish *Haliclystus auricula* was found at Site 29, attached to algae on a kelp stipe. Rock surfaces were typically covered with scour-resistant encrusting coralline, dark red and brown algae, the filamentous red alga *Pterosiphonia parasitica*, and keelworms. Areas of clean sand and gravel had razor shells *Ensis* sp and sparse maerl.



Loch Torridon Narrows & Ardheslaig

This central area, around the 120m-deep narrows between Loch Shieldaig and Loch Torridon, was notable for deeper, sheltered circalittoral rock. At Site 41, silted rock at 30-34m had abundant brachiopods *Neocrania anomala*, with fine hydroids and barnacles, while featherstars (including the northern species *Antedon petasus*) were abundant in shallower water. At Site 46, ascidians, particularly *Ascidiella aspersa*, dominated boulders from 8-19m. The goose-foot starfish *Anseropoda placenta* was found in sediments at Site 45

Loch Shieldaig

Semi-sheltered and sheltered sites in Loch Shieldaig (Sites 42, 43, 47, 48 & 49) had mixtures of rock and bouldes with urchin-grazed sugar kelp forests, and mixed sediments with a variety of epifauna and infauna. Prominent species included long-clawed squat lobsters *Munida rugosa,* hermit crabs, spiny starfish *Marthasterias glacialis*, seven-armed starfish *Luidea ciliaris*, scallops, velvet crabs, dragonets and lightbulb seasquirts. The round crab *Atelecyclus rotundatus* was found at three sites in Loch Shieldaig.

Loch Diabaig

In deeper water in Loch Diabaig (Sites 37-40), the seabed of soft mud had typical communities of the seapens *Funiculina quadrangularis* and *Pennatula phosphorea*, burrowing brittlestars *Amphiura* sp, and crustacean burrows. The giant naked foraminiferan *Toxisarcon alba* (see below) was found at Sites 40 and 41, and the white seaslug *Philine aperta* at Site 40.

Upper Loch Torridon

An extensive bed of maerl *Phymatolithon calcareum* was found across the head of Upper Loch Torridon (Sites 50-54), mainly at depths of 1-5m. The maerl formed an almost complete cover in places, and large areas were completely hidden by a dense forest of sugar kelp, with holdfasts attached to the maerl nodules. The maerl appeared dense, but was often a single layer of much-branched nodules overlying firm muddy sediment, bound by frequent horse mussels *Modiolus modiolus*.

There were many small animals living amongst the maerl and kelp holdfasts, particularly the turban topshell *Gibbula magus*, brittlestars, green urchins *Psammechinus miliaris*, terebellid worms, scale worms, queen scallops and butterfish, while brittlestars *Ophiothrix fragilis* were spawning on top of the kelp (see front cover). The pelican's foot shell *Aphorrais pespelicani* was found at Site 53

Species seen on the survey

The table opposite shows the numbers of species recorded in each main group, together with some commonly recorded species. The number of species recorded on this survey is relatively low, reflecting the type of survey and lack of time for identifying collected specimens. However, as on the previous survey, a variety of echinoderms, crustaceans and molluscs in particular was recorded. There were fewer species of cnidarians and tunicates, but almost twice as many fish species as on the first Torridon survey.

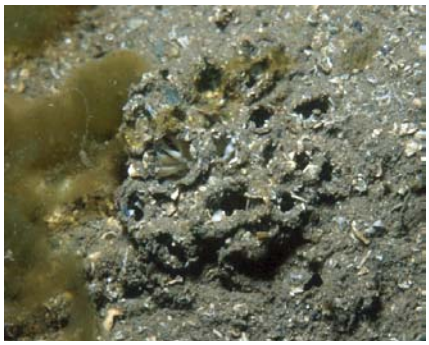
Phylum	Common name	No of species	Common species
Algae	Seaweeds	35	Kelps *Laminaria* spp Encrusting coralline algae Maerl *Phymatolithon calcareum* *Desmarestia* spp Sea lettuce *Ulva* sp
Foraminifera	Foraminiferan	1	Giant naked foraminiferan *Toxisarcon alba*
Porifera	Sponges	1	
Cnidaria	Anemones, corals, sea firs	13	Kelp hydroid *Obelia geniculata* Burrowing anemone *Cerianthus lloydii* Sea pen *Virgularia mirabilis*
Nemertea	Worms	1	
Annelida	Segmented worms	10	Keelworm *Pomatoceros triqueter* Sandmason *Lanice conchilega*
Chelicerata	Sea spiders	1	
Crustacea	Prawns, crabs, lobsters	19	Hermit crabs Paguridae Brown crab *Cancer pagurus* Velvet crab *Necora puber* Long-clawed squat lobster *Munida rugosa* Swimming crab *Liocarcinus depurator*
Mollusca	Snails, bivalves, sea slugs, octopus	21	King scallop *Pecten maximus* Queen scallop *Aequipecten opercularis* Razor shell *Ensis* sp Tower shell *Turritella communis*
Brachipoda	Lamp shells	1	*Neocrania anomala*
Bryozoa	Sea mats	1	Lacy sea mat *Membranipora membranacea*
Echinodermata	Starfish, urchins, sea cucumbers	18	Common urchin *Echinus esculentus* Common starfish *Asterias rubens* Seven-armed starfish *Luidea ciliaris* Red cushion star *Porania pulvillus* Common featherstar *Antedon bifida* Spiny starfish *Marthasterias glacialis* Sunstar *Crossaster papposus*
Tunicata	Sea squirts	5	Lightbulb seasquirt *Clavellina lepadiformis* *Ciona intestinalis*
Pisces	Fish	17	Gobies *Pomatoschistus* spp Butterfish *Pholis gunnellus* Dragonet *Callionymus lyra*
TOTAL SPECIES		144	

Species of particular interest

A 'giant' skate, estimated to be about 1.8m long, was a memorable sighting for divers on Loch Diabaig sill (Site 37). Loch Torridon is well known locally for sightings in summer of large skate, a species which is virtually extinct in some other areas of Britain because of bottom trawling. Pogge or hooknose *Agonus cataphractus* was seen at Sites 42 and 51, and leopard-spotted gobies *Thorogobius ephippiatus* at three sites.

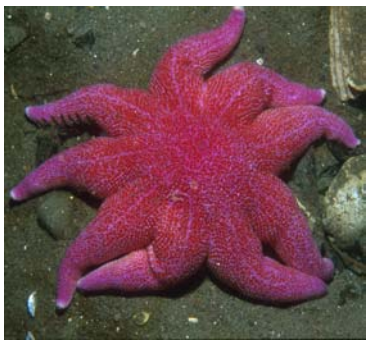
The distinctive giant naked foraminiferans found on previous surveys in Loch Torridon have been recently described and named as *Toxisarcon alba*, the specific name reflecting both its white colour and its distribution - so far it has only been found in Scottish sealochs, in deeper water in mixed muddy sediments. On this survey it was found at Sites 40 and 41. The absence of trawling in Loch Torridon may well be responsible for the continued presence in the loch of this delicate organism, as well as maintaining rich infauna and epifauna on sediments throught the loch system.

Other interesting finds included the stalked jellyfish *Haliclystus auricula,* the round crab *Atelecyclus rotundatus*, turban topshell *Gibbula magus*, pelican's foot shell *Aphorrais pespelicani*, opisthobranch seaslug *Philine aperta*, and goosefoot starfish *Anseropoda placenta*.



Giant naked foraminiferan *Toxisarcon alba,* intact (left) and with 'pepperpot' of sand grains removed (right)

A number of 'northern' species that prefer colder water are common in Loch Torridon, including the featherstar *Antedon petasus* and purple sunstar *Solaster endeca*.



Surveyors taking part were: Calum Duncan and Jim Bromham (organisers), Janet Bromham, Judith Bromham, Karen Clarke, Steve Colligan, Jane Donaldson, Simon Keith, Andy Macdonald, Lee Patchell, Sue Scott, Juliet Shrimpton, Doug Smith, Colin Wishart and Stepanie Saunders.
Seasearch Loch Torridon 2001 was coordinated by MCS Scotland and funded by SNH.

Report and photographs by Sue Scott.

Seasearch is a volunteer underwater survey project for recreational divers to contribute to the conservation of the marine environment. Financial support for the project during 2003 and for the production of this summary report has been given by: