

**Marine Nature Conservation Review**

**Sectors 15 and 3**

**Sealochs in north-west Scotland**

**Area summaries**

**Frances A. Dipper & Charlotte M. Johnston**  
with additional text by

**David Connor, Jon Davies, Kate Northen, Jane Richardson, Kathy Rickards &  
Kathy Wood**



**2005**

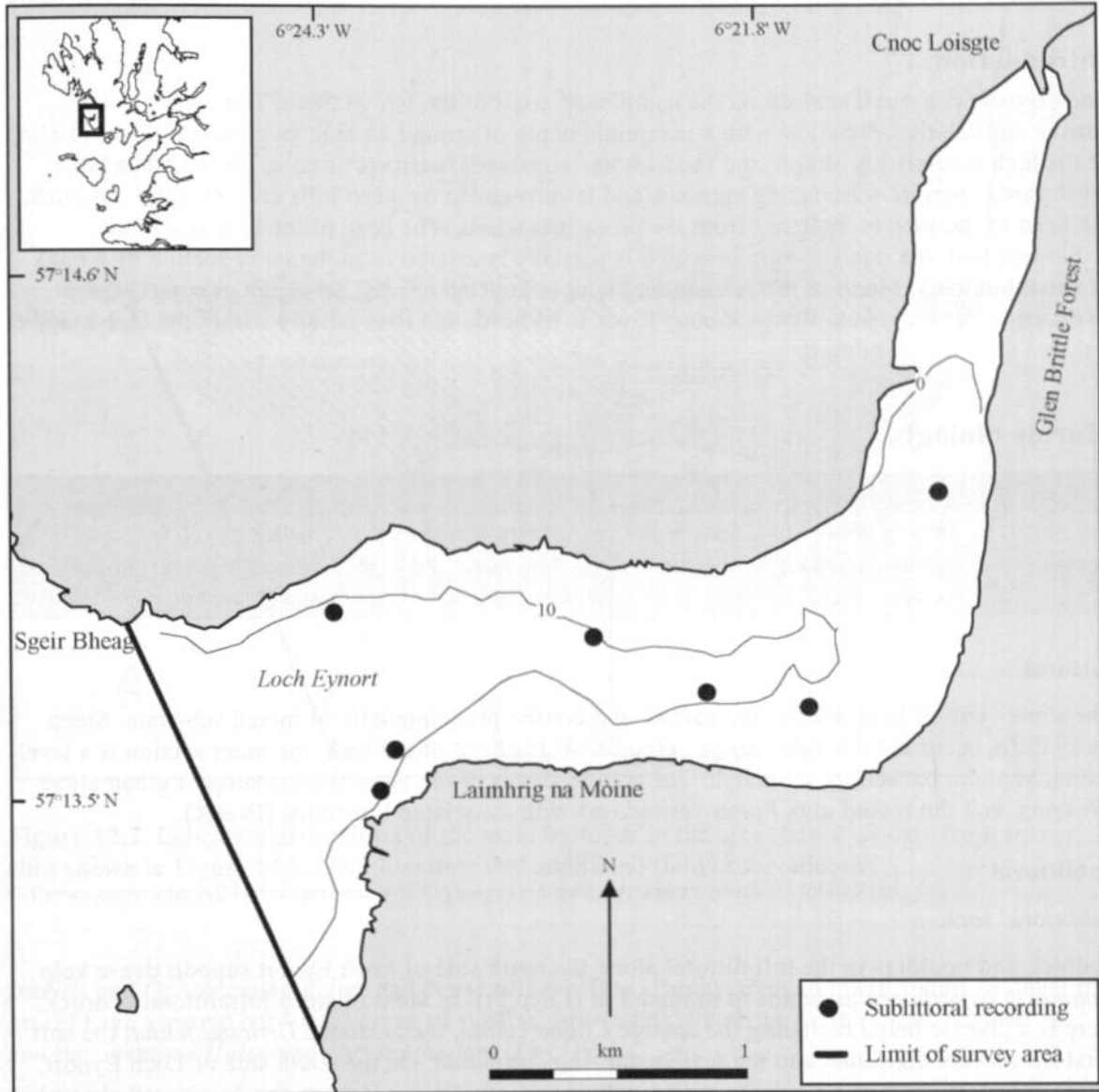
**Series editor: David Connor**

## 12

## Loch Eynort

## Location

Position (centre)	NG 365 241	57°13.9'N 06°22.5'W
Administrative area	Highland	Skye and Lochalsh
Conservation agency/area	Scottish Natural Heritage	North Areas



**Figure 12.1** Main features of the area, showing sites surveyed.

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**Physical features**

<i>Physiographic type</i>	Open sealoch
<i>Length of coast</i>	14.1 km
<i>Length of inlet</i>	4.9 km
<i>Area of inlet</i>	3.6 km <sup>2</sup>
<i>Bathymetry</i>	Maximum depth 14 m at entrance
<i>Wave exposure</i>	Exposed at entrance; sheltered at head
<i>Tidal streams</i>	Moderate around entrance to loch; weak within loch
<i>Tidal range</i>	3.3 m (mean springs); 1.5 m (mean neaps) (Mallaig)
<i>Salinity</i>	Fully marine in outer loch; reducing towards head of loch

**Introduction**

Loch Eynort is a small sealoch on the south-west coast of the Isle of Skye. The loch is quite narrow and relatively shallow with a maximum depth of around 14 m at its entrance. The shoreline of the loch is relatively simple and the loch has no islands, narrows or sills. The loch bends northwards from its west-facing entrance and is surrounded by steep hills on both sides. As such, the head of the loch is sheltered from the prevailing winds. The head of the loch is a level sediment plain, the inner section of which is partially restricted from the outer section by a bank of small boulders. Much of the surrounding land is forested or used for rough grazing. Several rivers enter the loch, notably the Eynort River at its head, and thus salinity within the loch may be reduced after heavy rainfall.

**Marine biology****Marine biological surveys**

	<i>Survey methods</i>	<i>No. of sites</i>	<i>Date(s) of survey</i>	<i>Source</i>
<i>Sublittoral</i>	Recording (epibiota)	2	June 1988	Hiscock & Covey (1991)
	Recording (epibiota)	5	May 1988	Holt (1988)

**Littoral**

The shores within Loch Eynort are narrow and consist predominantly of mixed substrata. Steep rocky cliffs occur at both sides of the entrance. At the head of the loch, the inner section is a level sediment plain, backed by saltmarsh. The cobble shores of the outer section support green algae *Ulva* spp. and the furoid alga *Fucus vesiculosus* with associated littorinids (FvesX).

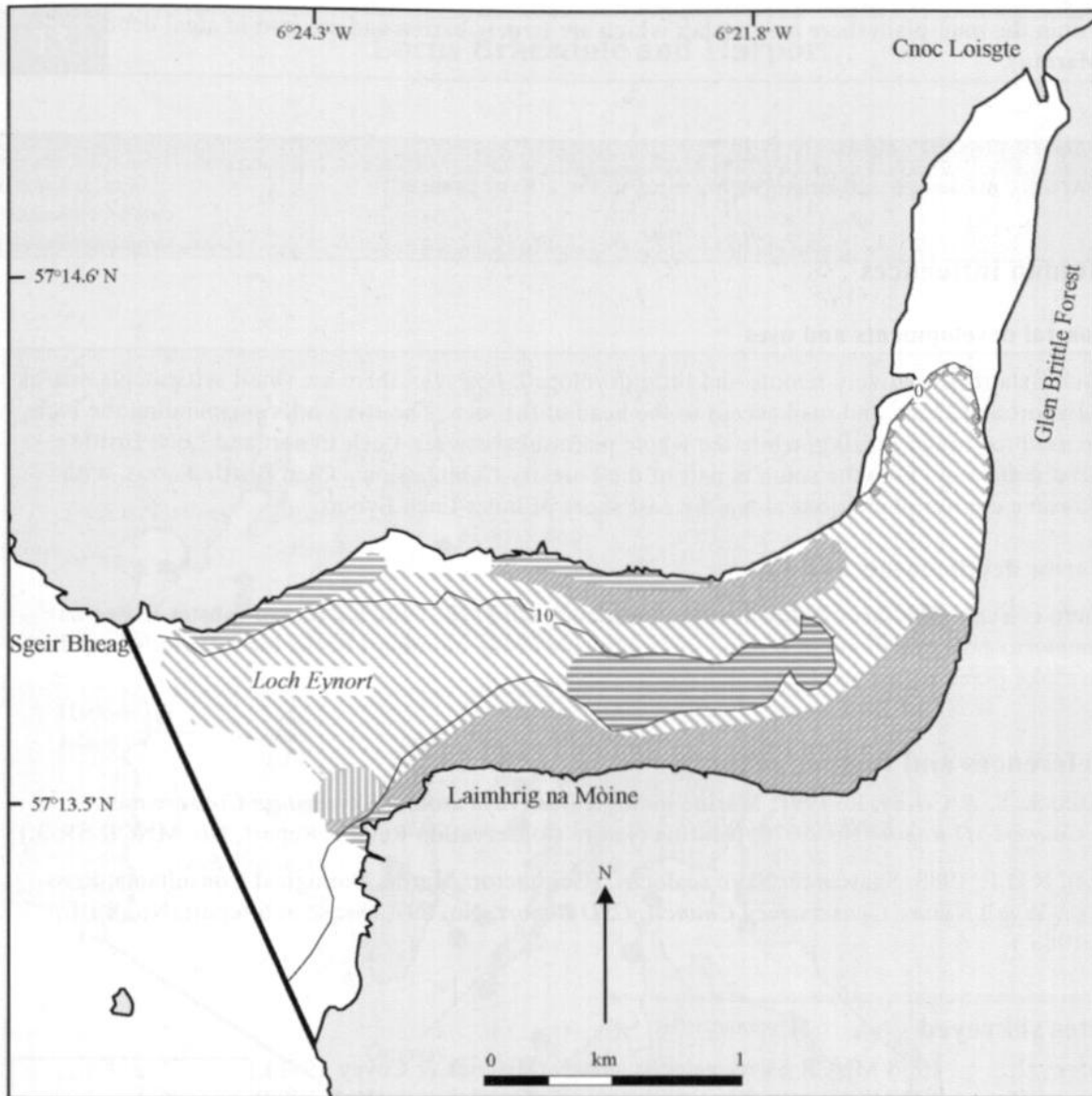
**Sublittoral***Sublittoral rock*

Bedrock and boulders in the infralittoral along the north side of Loch Eynort support dense kelp *Laminaria hyperborea* to depths of around 3 m (Lhyp.Ft). In areas of steep infralittoral bedrock, there is a diverse fauna including the sponge *Cliona celata*, the anemone *Urticina felina*, the soft coral *Alcyonium digitatum* and the featherstar *Antedon bifida*. On the south side of Loch Eynort, where substrata are generally more mixed, *Laminaria saccharina* is often the dominant kelp and is found on boulders within sand to depths of around 6 m (LsacX).

*Sublittoral sediment*

Below the kelp, lower infralittoral gravels support filamentous brown algae, possibly *Arthrocladia villosa*, with burrowing bivalves *Ensis ensis* and *Mya* sp., the anemone *Cerianthus lloydii* and the starfish *Asterias rubens*.

Tide-swept gravels at the entrance to Loch Eynort are more diverse with hydroids, including *Nemertesia* sp. and *Kirchenpaueria* sp., the featherstar *Antedon bifida*, the brittlestars *Ophiothrix*



**Figure 12.2** Indicative distribution of the main biotopes in the area (based on data from survey sites shown in Figure 12.1, cited literature and additional field observations).

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*fragilis* and *Ophiocomina nigra*, and dense foliose algae. Patchy areas of maerl found amongst the gravel have a sparse but varied fauna of starfish, brittlestars, bivalves, hermit crabs *Pagurus* sp. and the anemone *Halcampa chrysanthellum* (Phy.HEc).

Below depths of around 11 m, circalittoral sand extends to variable distances offshore. Epifauna on the sand are relatively impoverished but burrowing bivalves, including *Ensis siliqua*, the polychaete *Sabella pavonina* and the masked crab *Corystes cassivelaunus* are present (EcorEns).

The sandy plain at the head of the loch supports lugworms *Arenicola marina* and the sand mason worm *Lanice conchilega* at high densities, with the bivalves *Cerastoderma edule*, *Mya arenaria* and *E. ensis* (Lcon).

At the centre of the loch at a depth of 11–12 m are dense beds of the sea-pen *Virgularia mirabilis* on soft mud, with an abundance of brittlestars *Amphiura* sp. and *Ophiura* sp., Norway lobsters *Nephrops norvegicus*, sea-slugs *Philine aperta*, and a number of polychaete worms (PhiVir).

Within the mud-plain there are patches which are largely barren and covered in algal debris (MarMu).

### Nature conservation

There are no designated conservation sites in the area at present.

### Human influences

#### Coastal developments and uses

Loch Eynort is relatively remote and little-developed; however, there are small settlements nearby at Eynort and Grula and road access to the head of the loch. The steep hills surrounding the loch are used for rough grazing, while the whole peninsula between Loch Eynort and Loch Brittle (*Area summary 11*) to the south is part of the Forestry Commission's Glen Brittle Forest, with extensive conifer plantations along the east shore of inner Loch Eynort.

#### Marine developments and uses

There is a shellfish farm within Loch Eynort, and Holt (1988) noted a line of lobster *Homarus gammarus* pots at a depth of 6 m on the south side of the outer part of the loch. Periodic trawling may take place within the loch.

### References and further reading

- Hiscock, S. & Covey, R. 1991. Marine biological surveys around Skye. *Nature Conservancy Council SD Report No. 1076*. (Marine Nature Conservation Review Report, No. MNCR/SR/3.)
- Holt, R.H.F. 1988. Seasearch: Skye sealochs. (Contractor: Marine Biological Consultants, Ross-on-Wye.) *Nature Conservancy Council, CSD Report, No. 897*. (Seasearch report, No. SS/1/1988.)

### Sites surveyed

- Survey 2: 1988 MNCR Skye sealochs survey (Hiscock & Covey 1991).  
 Survey 52: 1988 Seasearch: Skye sealochs sublittoral survey (Holt 1988).

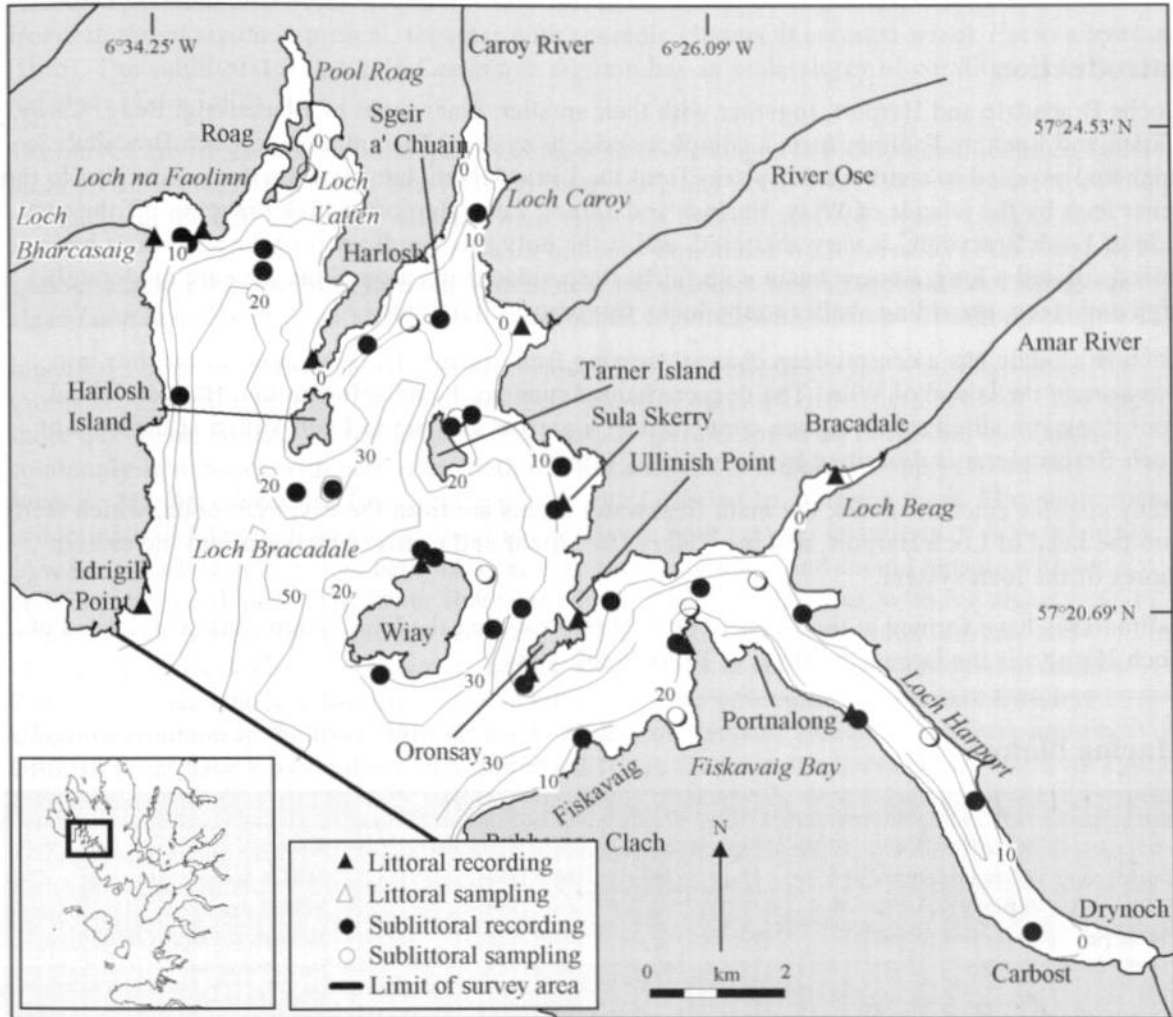
Sublittoral sites					
Survey	Site	Place	Grid reference	Latitude/longitude	Biotopes recorded
2	9	SE of Sgeir Bheag, Loch	NG 354 236	57°13.6'N 06°22.9'W	Phy.HEc; EphR
2	10	Inner loch, Loch Eynort,	NG 367 239	57°13.8'N 06°21.7'W	MarMu; PhiVir
52	7	Head of loch, Loch Eynort,	NG 376 247	57°14.3'N 06°20.9'W	FvesX; Lcon
52	8	Below woods, SE Loch Eynort,	NG 371 239	57°13.8'N 06°21.3'W	LsacX
52	9	N side of mid-loch, Loch Eynort, Skye	NG 363 242	57°13.9'N 06°22.2'W	LsacX; EcorEns; Lhyp.Ft
52	10	N side of outer loch, Loch Eynort, Skye	NG 353 243	57°13.9'N 06°23.2'W	Lhyp.Ft
52	11	Outer site on S side, Loch Eynort, Skye	NG 355 237	57°13.6'N 06°22.9'W	EphR

## 13

## Lochs Bracadale and Harport

## Location

Position (centre)	NG 291 389	57°21'W 06°30'N
Administrative area	Highland	Skye and Lochalsh
Conservation agency/area	Scottish Natural Heritage	North Areas



**Figure 13.1** Main features of the area, showing sites surveyed.

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Physical features	
<i>Physiographic type</i>	Open sealoch with inner fjordic loch (Harport)
<i>Length of coast</i>	88.7 km (106.6 km including islands)
<i>Length of inlet</i>	9.4 km
<i>Area of inlet</i>	61.1 km <sup>2</sup> (58.4 km <sup>2</sup> excluding islands)
<i>Bathymetry</i>	Maximum depth 60–80 m in central area of mouth; main basin of Bracadale >30 m deep. Slight sill at 20 m depth in narrows of Loch Harport; maximum depth of inner basin 30 m
<i>Wave exposure</i>	Exposed at mouth; inner Bracadale sheltered by islands; Loch Harport very sheltered
<i>Tidal streams</i>	Generally very weak; becoming moderate in the narrows of Loch Harport
<i>Tidal range</i>	4.3 m (mean springs); 1.7 m (mean neaps) (Loch Harport)
<i>Salinity</i>	Fully marine to variable

## Introduction

Lochs Bracadale and Harport, together with their smaller, inner lochs of Bharcasaig, Beag, Caroy, Vatten and Loch na Faolinn, form a complex sealochs system. The entrance to Loch Bracadale is open and exposed to south-westerly seas from the Little Minch, but some shelter is provided to the inner loch by the islands of Wiay, Harlosh and Tarner. Loch Harport, which branches off the east side of Loch Bracadale, is very sheltered, and is the only true fjordic part of the system. It has a raised sill and a long, narrow basin with fairly steep sides. Hills around the area are moderately high and steep, providing shelter to the lochs from most directions.

Loch Bracadale has a central deep channel running from its mouth. This channel branches into two around the island of Wiay. The deeper channel runs north and splits around Harlosh Island. Pool Roag is a silled saline lagoon connected by a narrow channel to Loch Vatten at the head of Loch Bracadale; it is described by Covey *et al.* (1998).

Many streams enter the lochs; the main freshwater inputs are from the River Drynoch, which feeds into the head of Loch Harport, and the Rivers Ose, Amar and Caroy, which run into the eastern shores of the loch system.

Saltmarshes have formed at the heads of several inlets within the loch system; that at the head of Loch Harport is the largest on Skye, at 16 ha (Scott 1984).

## Marine biology

Marine biological surveys				
	<i>Survey methods</i>	<i>No. of sites</i>	<i>Date(s) of survey</i>	<i>Source</i>
<i>Littoral</i>	Recording (epibiota)	12	June 1991	MNCR survey
	Infaunal sampling (core)	1	June 1991	MNCR survey
<i>Sublittoral</i>	Recording (epibiota)	10	June 1988	Hiscock & Covey (1991)
		19	May 1988	Holt (1988)
	Infaunal sampling (core)	9	June 1991	MNCR survey

### Littoral

Shores are mainly rocky, with mixed substrata and sediments near the heads of the lochs and inlets.

#### *Littoral rock*

Most of the shoreline is of igneous rock, with characteristic fissures and crevices. The system is similar to other sealochs in Skye, having an irregular, craggy coastline. Whilst many of the shores are of steep or vertical bedrock, numerous shore platforms and gullies are present in the outer loch areas, slightly altering the species composition at various levels on the shore.

Wave-exposed outer and steep areas of the loch system have yellow and grey lichens in the upper littoral fringe (YG), with a wide zone of black lichen *Verrucaria maura* below, and with crevices supporting numerous periwinkles *Littorina neritoides* (Ver.Ver). Within the *V. maura* zone on the western coast of Loch Bracadale, rockpools and gullies also contain *L. neritoides* with bleached algae *Enteromorpha* sp. and *Monostroma* sp (G). Large rockpools also occur on the upper shore at Harlosh Point in central Loch Bracadale. Below the lichens, channelled wrack *Pelvetia canaliculata* and barnacles *Chthamalus* sp. form a mosaic, with spiral wrack *Fucus spiralis* also common (PelB). The mid and lower shore is dominated by a mosaic of barnacles *Semibalanus balanoides* and bladder wrack *Fucus vesiculosus* (FvesB). Juvenile mussels *Mytilus edulis* form crusts in patches with limpets *Patella* sp. (MytB). Small clumps of the red algae *Ceramium* sp. and *Palmaria palmata* also occur within this biotope. In the steep lower littoral, thongweed *Himantalia elongata* is present, together with sporadic clumps of serrated wrack *Fucus serratus* (Him). The sublittoral fringe kelp *Laminaria digitata* has an understory of coralline and crustose red algae (Ldig.Ldig).

The shores are rocky well into the loch system, with few changes in biotope composition. Some inner areas, such as to the west side of Loch Bharcasaig and north Wiay, have deep crevices and overhangs in the mid and lower littoral which support a rich biota of red algae, sponges and anemones. These species are associated with biotopes dominated by *F. serratus* (Fser.Fser) and to a lesser extent by *L. digitata*. In Loch Vatten, near the entrance to the lagoonal Pool Roag, the algae *Laminaria saccharina* and *Chorda filum* occur, together with shrimps *Crangon crangon*.

Inner bays of mixed substrata have a biota typical of inner sealochs in the west Highlands. The shores are generally boulders, cobbles and pebbles, with outcrops of fissured bedrock. The upper shore has sparse stunted *P. canaliculata* (Pel) with *F. spiralis* lower on the shore, both algae commonly in mosaics with barnacles (both *Chthamalus* and *Semibalanus* spp.) (BPat.Cht). Juvenile *Mytilus edulis* also form aggregations, with *Littorina* sp. between them. Mid-shore rock is dominated by knotted wrack *Ascophyllum nodosum*, with varying quantities of *F. vesiculosus* (AscAsc). Large boulders and bedrock generally have a barnacle and furoid mosaic with an understory of red algae. The lower shores are dominated by *F. serratus*, with red algae, commonly *Osmundia* spp., between the furoids (FserX). In some areas, rock crevices and overhangs are particularly species-rich, having an epifauna of sponges and colonial ascidians. Pools have abundant coralline crusts (Cor), with *Corallina officinalis* and sea-oak *Halidrys siliquosa* common in the lower littoral. Rocky shores on the west side of Sula Skerry and on Ullinish Point have a particularly rich sublittoral fringe fauna on the lower shore, while rockpools and overhangs higher up the shore increase species diversity at these sites.

The narrows at the entrance to Loch Harport have pools at all levels of the shore, with the upper shore pools dominated by juvenile mussels with abundant littorinids. The lower shores are particularly diverse, with patches of sponges, anemones, the colonial ascidians *Botryllus schlosseri* and *Botrylloides leachi*, and red algae between the *F. serratus* plants. The dogwhelk *Nucella lapillus* was noted during the 1991 MNCR Loch Bracadale survey as being particularly abundant, feeding on the dense cover of small mussels and barnacles present. Kelps in the sublittoral fringe are a mixture of *L. digitata* and *L. hyperborea* with some *Alaria esculenta*, with a rich associated fauna including ascidians and anemones *Sagartia elegans*.

Within Loch Harport the steep and vertical sheltered bedrock and boulder shores on the south-western side are narrow, dominated by furoid algae and barnacles, but quite species-rich, with many species in common with more wave-exposed sites in Loch Bracadale. The sublittoral fringe consists of boulders on sediment with kelp *L. saccharina* and bootlace weed *C. filum*.

Loch Harport and the area near the River Ose are particularly influenced by brackish water, with mussels and the furoid *Fucus ceranoides* present in freshwater streams that run down the shore (FcerX). Mussel beds are also present on the lower shore at the loch heads – notably Loch Beag, where a dense *Mytilus* bed forms a sill over which tidal currents run in the narrows where the road crosses the loch head. Associated species include barnacles, winkles (mainly *Littorina littorea*) and scattered algae attached to the mussel aggregations.



*Littoral sediment*

Sediment communities are found on the lower shores of the upper loch areas, particularly Loch Harport. A relatively impoverished biota is associated with these brackish areas, which are generally dominated by the green alga *Enteromorpha* sp. and the serrated wrack *Fucus serratus*. The infauna is dominated by the cockle *Cerastoderma edule*, with finer sediments supporting lugworms *Arenicola marina* and gapers *Mya* sp.

Dense carpets of the unattached brown alga *Ascophyllum nodosum* ecad. *mackaii* are found in the sheltered muddy areas of Loch Beag (AscX.mac). Mud-snails *Hydrobia* sp. and littorinids are also present, with scattered cobbles overlying the mud supporting *Fucus vesiculosus* and barnacles.

**Sublittoral***Sublittoral rock*

A wide variety of sublittoral biotopes are present in Loch Bracadale, reflecting the complexity of the loch, with several islands giving varying degrees of shelter from wave action, and creating tidal streams between the islands. Bedrock and boulder slopes generally extend from the shores into the sublittoral, often down to 20 m depth.

Upper infralittoral areas, whether vertical or sloping, are dominated by kelp forest, with species composition depending on the exposure of the site. *Laminaria digitata* occurs in the sublittoral fringe in outer areas, with areas of extreme shelter such as upper Loch Harport supporting dense forests of *L. saccharina*. Within the inner lochs of Harport and Vatten, *L. saccharina* has an associated flora of red foliose algae, or on mixed substrata, bootlace weed *Chorda filum*.

The more exposed outer areas of the lochs support quite sparse *Laminaria hyperborea* kelp forests, often heavily grazed by the common urchin *Echinus esculentus*. In outer Loch Bracadale, off the south-west side of Wiay, steep bedrock cliffs grade into boulder slopes. There is a rich red algal flora on upper rock surfaces, with vertical rock supporting a fauna of dead-man's fingers *Alcyonium digitatum*, anemones *Corynactis viridis* and *Urticina felina*, the featherstar *Antedon bifida* and the ascidian *Ciona intestinalis*. The boulder slopes below the cliffs support sparse foliose red algae, massive colonies of the sponge *Cliona celata*, encrusting bryozoans, erect hydroids, and numerous wrasse, with clusters of large anemones *Metridium senile* on some boulders (CorMetAlc).

In surge gullies and tide-swept areas, such as close to Oronsay near Loch Harport mouth, small amounts of kelp *Alaria esculenta* are present, mixed with *L. hyperborea* and *L. digitata*. Associated fauna in this zone, mainly on steep rock faces and large boulders, are *A. digitatum*, *U. felina*, *C. viridis*, *A. bifida* and *C. intestinalis*.

Bedrock pinnacles rise from a muddy sand bottom in the middle of the north-western arm of Loch Bracadale. Sparse kelp occurs here from the top of the pinnacles at 6 m down to 13 m depth, with rock extending down to 18 m. The rock under the kelp canopy and at greater depths is poor in species, dominated by brittlestars *Ophiocomina nigra*, with *E. esculentus*, a few anemones *M. senile* and *Sagartia elegans*, and encrusting red and brown algae. At the base of the pinnacles is a dense maerl bed on shell-gravel at around 15 m depth. Other rock areas nearby have sparse kelp *L. hyperborea* with a sparse fauna of *A. bifida*, *A. digitatum* and *E. esculentus*. In the more wave-exposed areas south of Harlosh Island, the fauna under the kelp is richer, with *C. celata*, the cup coral *Caryophyllia smithii* and the ascidian *Clavelina lepadiformis*, in addition to featherstars and patches of dense brittlestars, here being mostly *Ophiothrix fragilis* with some *O. nigra*.

In more sheltered areas of Loch Bracadale, such as east of Harlosh Point, the fauna under the kelp canopy consists of *C. celata* and the keel worm *Pomatoceros triqueter* on bedrock, with boulders in this area dominated by the sea cucumber *Pawsonia saxicola* and the featherstar *Antedon petasus*.

In sheltered areas north of Wiay, boulder slopes dominated by kelps *L. hyperborea* and *L. saccharina* with *A. bifida* give way to muddy shell-gravel with filamentous red and brown algae, *C. lloydii* and the bivalves *Ensis siliqua*, *E. ensis* and *Pecten maximus*. A similar biota is found in the mouth of Loch Caroy at Sgeir a' Chuain, but here also includes the holothurian *P. saxicola*, edible crabs *Cancer pagurus* and squat lobsters *Munida rugosa* under boulders, and *C. smithii* on upper rock surfaces. These boulder slopes tend to give way to deeper muddy sand areas which support the sea-pen *Virgularia mirabilis*, *C. lloydii* and *P. maximus* (VirOph). Other, less exposed slopes, such as to the west of Portnalong, have dense beds of *O. nigra* spreading onto the sediment plain below the rock.

#### *Sublittoral sediment*

Maerl beds and associated gravel are present at several sites within the loch system. Near the entrance to Loch Harport, where the loch narrows to join Loch Bracadale, there is an extensive maerl bed at around 10 m depth, with a fairly rich associated fauna, including the wrinkled swimming crab *Liocarcinus corrugatus*. Maerl beds are also found in eastern Loch Bracadale to the north and west of Sula Skerry, as well as the small bed mentioned above in the north-western arm of Loch Bracadale (PhyR).

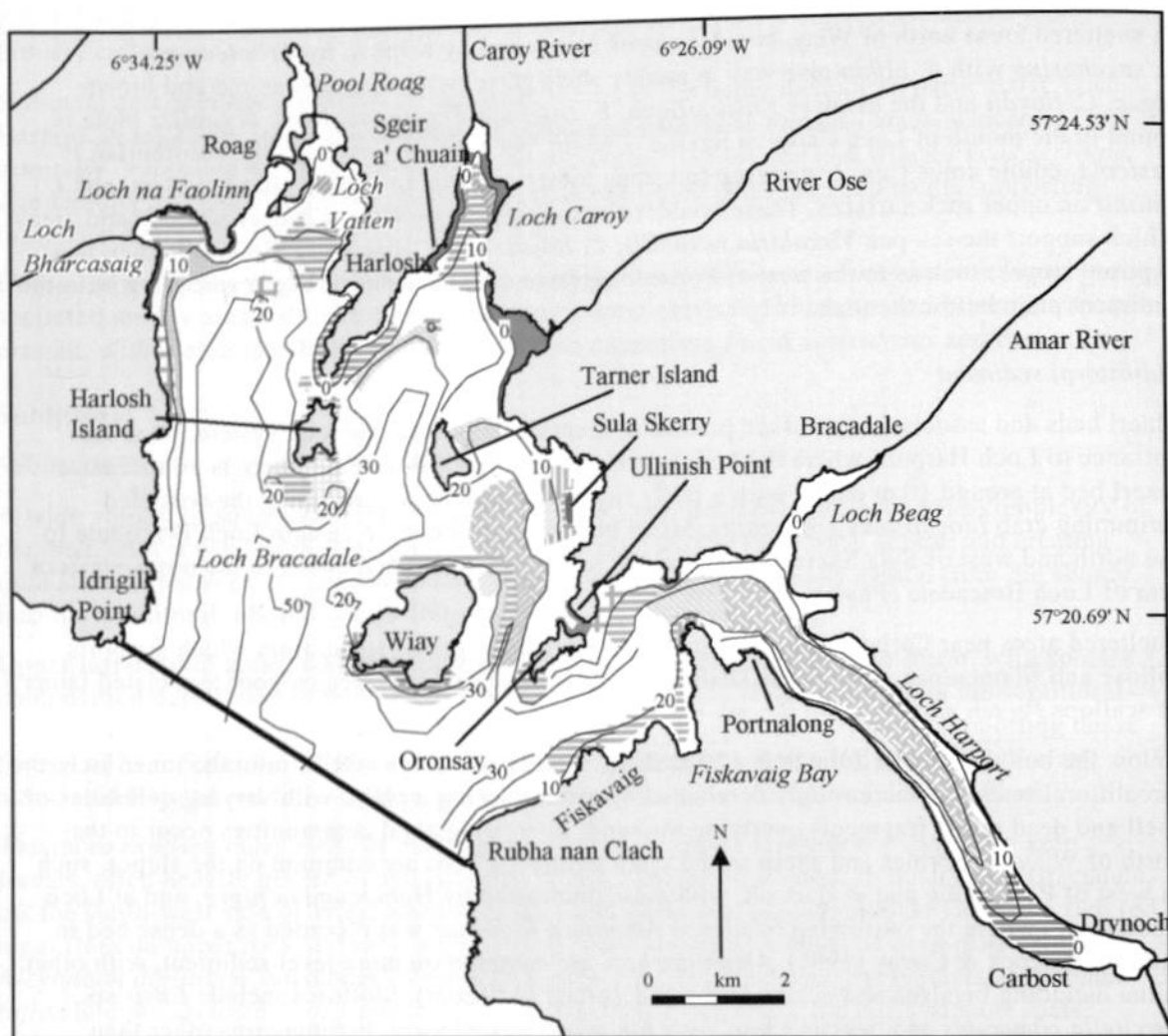
Sheltered areas near Carbost in Loch Harport have a muddy gravel substratum which supports foliose and filamentous algae in the shallow areas, with a relatively species-poor associated fauna of scallops *Pecten maximus* and the sea-slug *Philine aperta*.

Below the boulder slopes, from about 20 m depth in the outer areas and 12 m in the inner loch, the circalittoral seabed is increasingly dominated by sand, forming a plain, with varying quantities of shell and dead maerl fragments overlying the sand. Interesting algal communities occur to the north of Wiay on pebbles and shells in the sand. Brittlestar beds are common on the slopes, such as west of Portnalong and at Harlosh, with areas dominated by *Ophiocomina nigra*, and at Loch Bharcasaig, where the burrowing brittlestar *Amphiura filiformis* was recorded as a dense bed in sand by Hiscock & Covey (1991). *Amphiura* spp. are common on more level sediment, with other fauna including bivalves and echinoderms widespread (AfilEcor). Molluscs include *Ensis* sp., *Turritella communis* and pelican's foot shell *Aporrhais pespelecani*. Echinoderms other than brittlestars include the heart urchin *Echinocardium cordatum* and sandstar *Astropecten irregularis*.

A large area of sand is found in Fiskavaig Bay to the west of Portnalong. Fauna present include bivalves *Ensis ensis*, *Ensis siliqua* and *P. maximus*, and the burrowing anemone *Cerianthus lloydii*. More mobile fauna common to this habitat include crabs such as *Liocarcinus* sp. and *Corystes cassivelaunus*, and the sea cucumber *Neopentadactyla mixta* (EcorEns).

Below 20 m, or in shallower water in extreme shelter, muddy sand occurs, with the proportion of finer sediment increasing with depth. Little is known of the infauna. North of Wiay, at a depth of 22 m, is a basin of muddy sand with shell-gravel and dead maerl, with a conspicuous infauna of the tubed polychaetes *Chaetopterus variopedatus* and *Lanice conchilega*. South of Bracadale at a depth of 32 m, a basin of muddy sand has an epifauna of *C. lloydii*, sea-pens *Virgularia mirabilis* and dead-man's fingers *Alcyonium digitatum*.

From the sill of Loch Harport near Portnalong to the head of the loch near Carbost is a basin of sandy mud with a maximum depth of 30 m near Portnalong, gently shallowing towards the loch head. The soft mud has a variety of burrows and mounds including those of the burrowing crustaceans *Nephrops norvegicus* and *Calocaris macandreae*. Sea-pens *V. mirabilis* and *Pennatula phosphorea* are found, including a forest of particularly tall *V. mirabilis* in mid-Loch Harport (SpMeg). Scattered boulders on the mud support the anemone *Metridium senile*. Towards the head of Loch Harport in shallow water (8 m), the mud surface is dominated by *C. lloydii*, with lugworm *Arenicola marina*, brittlestars *Ophiura* sp., juvenile *P. maximus*, the turret shell *T. communis* and the bivalve *Arctica islandica* also common.



**Figure 13.2** Indicative distribution of the main biotopes in the area (based on data from survey sites shown in Figure 13.1, cited literature and additional field observations).  
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### Nature conservation

There are no designated conservation sites in the area at present.

### Human influences

#### Coastal developments and uses

Shores in this area are relatively undeveloped. The A863 and minor roads follow the eastern coast, while the B8009 runs along the south-west side of Loch Harport, ending at Portnalong and Fiskavaig, but the roads are rarely adjacent to the shore. Numerous small crofting settlements are scattered along these roads, the largest being Carbost, Portnalong and Bracadale on Loch Harport, and Harlosh and Roag on Loch Bracadale. Sewage disposal is probably by a mixture of septic tanks and gravity drainage into the sea.

The outer reaches of the loch system, especially the western shores of Loch Bracadale which form part of the Duirinish peninsula, are steep and uninhabited, with no road access. There is an area of

forestry plantation on the coast near Loch Bharcasaig. The north-eastern shore of Loch Harport is also very steep and undeveloped.

### Marine developments and uses

There are piers and jetties at various points, including Portnalong, Bracadale and Carbost. There are licences for Atlantic salmon farms at Harlosh Point, Loch Caroy and Loch Harport, and for mussel and oyster farms in Loch Harport. Fishing occurs from various locations, including potting for lobsters *Homarus gammarus*, crabs and Norway lobsters *Nephrops norvegicus* within the loch system.

### References and further reading

Connor, D.W. 1991. Benthic marine ecosystems in Great Britain: a review of current knowledge. Clyde Sea, west Scotland, Outer Hebrides and north-west Scotland (MNCR coastal sectors 12 to 15). *Nature Conservancy Council, CSD Report*, No. 1175. (Marine Nature Conservation Review Report, No. MNCR/OR/11.)

Covey, R., Fortune, F., Nichols, D. & Thorpe, K. 1998. *Marine Nature Conservation Review Sectors 3, 4, 12, 13 & 15. Lagoons in mainland Scotland and the Inner Hebrides: area summaries*. Peterborough, Joint Nature Conservation Committee. (Coasts and seas of the United Kingdom. MNCR series.)

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### Sites surveyed

- Survey 2: 1988 MNCR Skye sealochs survey (Hiscock & Covey 1991).  
 Survey 33: 1991 MNCR Loch Bracadale, Skye survey (MNCR, unpublished data).  
 Survey 52: 1988 Seasearch: Skye sealochs sublittoral survey (Holt, 1988).

Littoral sites					
Survey	Site	Place	Grid reference	Latitude/longitude	Biotores recorded
33	1	NE of Idrigill Point, Loch Bracadale, Skye	NG 254 366	57°20.2'N 06°33.8'W	Him; Cor; G; MytB; FvesB; Ldig.Ldig; PelB; Ver.B
33	2	W side of Loch Bharcasaig, Loch Bracadale, Skye	NG 256 420	57°23.1'N 06°34.0'W	Him; Cor; FvesB; Fspi; Fser.Fser; Ldig.Ldig; PelB, BPat.Cht
33	3	Caves W Meall Greepa, Loch Bharcasaig, Loch Bracadale, Skye	NG 263 421	57°23.2'N 06°33.3'W	FK, MytB; FvesB; Ldig.Ldig; Ver.B; BPat.Cht; BPat.Sem
33	5	Harlosh Point, Loch Bracadale, Skye	NG 279 402	57°22.2'N 06°31.6'W	Cor; FvesB; Fspi; Fser.R; PelB; BPat.Cht; BPat.Sem
33	6	Ose, Loch Bracadale, Skye	NG 310 407	57°22.6'N 06°28.5'W	G; Ver.Ver; Fspi; Asc.Asc; Pel

Littoral sites					
Survey	Site	Place	Grid reference	Latitude/longitude	Biotores recorded
33	7	Sula Skerry, Ullinish, Loch Bracadale, Skye	NG 316 381	57°21.2'N 06°27.7'W	Cor; FvesB; Ldig.Ldig; Fser.Fser.Bo; PelB; Ver.B
33	8	N Wiay, Loch Bracadale, Skye	NG 295 372	57°20.7'N 06°29.8'W	Cor; FvesB; Fser.R; Ldig.Ldig; PelB
33	9	SW Oronsay, Loch Bracadale, Skye	NG 311 356	57°19.9'N 06°28.1'W	Cor; G; FK; Fves; Fser.R; Ala.Ldig; SByAs; PelB; Ver.B; BPat.Cht
33	10	S Ullinish Point, Loch Bracadale, Skye	NG 318 364	57°20.3'N 06°27.4'W	Cor; Fspi; Asc.Asc; Fser.Fser; Pel
33	11	SW Ardtreck Point, Loch Bracadale, Skye	NG 334 360	57°20.1'N 06°25.8'W	Cor; YG; Ver.Ver; MytB; FvesB; Fser.R; Ala.Ldig; PelB
33	12	Head of Loch Beag, Loch Bracadale, Skye	NG 356 385	57°21.6'N 06°23.8'W	MytFab; AscX; FvesX; AscX.mac; PCer; Fspi; MytX
33	13	E of Portnalong, Loch Harport, Loch Bracadale, Skye	NG 358 350	57°19.7'N 06°23.4'W	AscX; Ver.Ver; Fspi; Asc.Asc; Ldig.Ldig; FcerX; Fser.Fser.Bo; FserX; Pel; LsacX; BPat.Sem

Sublittoral sites					
Survey	Site	Place	Grid reference	Latitude/longitude	Biotores recorded
2	14	Ardtreck Point, Loch Harport, Loch Bracadale, Skye	NG 332 360	57°20.2'N 06°26.0'W	Phy.R; LhypLsac.Ft
2	15	Inner Loch Harport, Loch Bracadale, Skye	NG 376 337	57°19.1'N 06°21.5'W	SpMeg; AmenCio.Met
2	16	SW Wiay, Loch Bracadale, Skye	NG 289 355	57°19.8'N 06°30.3'W	LhypR.Ft; CcParCar; CorMetAlc; LhypGz.Pk
2	17	Channel E of Wiay, Loch Bracadale, Skye	NG 305 362	57°20.2'N 06°28.6'W	VirOph; AfilEcor
2	18	N Wiay, Loch Bracadale, Skye	NG 297 373	57°20.7'N 06°29.6'W	Lsac.Pk; LhypLsac.Ft; LsacX
2	19	N of Sula Skerry, Loch Bracadale, Skye	NG 315 386	57°21.5'N 06°27.8'W	Phy.R
2	20	NE of Tarner Island, Loch Bracadale, Skye	NG 299 392	57°21.8'N 06°29.5'W	AmenCio; VirOph.HAs
2	21	S of Harlosh Island, Loch Bracadale, Skye	NG 282 383	57°21.2'N 06°31.1'W	FaAIC
2	22	Pinnacle NW of Harlosh Point, Loch Bracadale, Skye	NG 272 415	57°22.9'N 06°32.3'W	Phy.HEc; LhypGz.Pk
2	24	Loch Bharcasaig, Loch Bracadale, Skye	NG 260 420	57°23.1'N 06°33.6'W	AfilEcor; Ven.Neo; LhypLsac.Pk
33	14	W of Meall Greepa, Loch Bharcasaig, Loch Bracadale, Skye	NG 261 419	57°23.1'N 06°33.5'W	AfilEcor
33	15	N Cleat Skerry, Loch Vatten, Loch Bracadale, Skye	NG 279 429	57°23.7'N 06°31.7'W	LsacX
33	16	SW of Sgeir B Chuain, Ardmor, Loch Bracadale, Skye	NG 294 407	57°22.5'N 06°30.1'W	VirOph.HAs
33	17	E of Tarner Island, Loch Bracadale, Skye	NG 301 393	57°21.8'N 06°29.3'W	VirOph; Lcor
33	18	NE Wiay, Loch Bracadale, Skye	NG 305 370	57°20.6'N 06°28.8'W	Ven
33	19	Fiskavaig Bay, Loch Bracadale, Skye	NG 333 349	57°19.6'N 06°25.8'W	EcorEns
33	20	N of Ardtreck Point, Loch Bracadale, Skye	NG 335 365	57°20.4'N 06°25.7'W	Phy.R; LsacX
33	21	Off entrance to Loch Beag, Loch Bracadale, Skye	NG 345 369	57°20.7'N 06°24.8'W	SpMeg

Survey	Site	Place	Grid reference	Latitude/longitude	Biotores recorded
33	22	S Creag Bhreac, Loch Harport, Loch Bracadale, Skye	NG 370 346	57°19.5'N 06°22.1'W	SpMeg
52	12	Head, Loch Harport, Skye	NG 384 317	57°18.1'N 06°20.6'W	PhiVir
52	13	Below Portnalong, Loch Harport, Skye	NG 359 349	57°19.6'N 06°23.3'W	AmenCio; SpMeg; K
52	14	Point near 'Gesto B Ho', Loch Harport, Skye	NG 351 364	57°20.5'N 06°24.2'W	IMS; Lhyp.Ft; Lsac.Pk
52	15	W side of Ardtreck Point, Loch Harport, Skye	NG 332 360	57°20.2'N 06°26.0'W	EcorEns; LhypLsac
52	16	Point opposite Ardtreck Point, Loch Harport, Skye	NG 336 368	57°20.6'N 06°25.7'W	VirOph; LhypLsac; Tra
52	17	S end of loch, Loch Harport, Skye	NG 318 346	57°19.4'N 06°27.3'W	EcorEns; LhypGz.Ft
52	18	SW tip of Oronsay, Loch Bracadale, Skye	NG 310 354	57°19.8'N 06°28.1'W	Lhyp.Ft; Lhyp.Pk
52	19	SE of Ullinish Point, Loch Bracadale, Skye	NG 322 366	57°20.5'N 06°27.0'W	EcorEns; LhypGz.Ft
52	20	N side of Wiay Island, Loch Bracadale, Skye	NG 295 374	57°20.8'N 06°29.8'W	EcorEns; Lhyp.Ft; LsacX
52	21	Between Wiay Island and Ullinish Point, Loch Bracadale, Skye	NG 309 365	57°20.4'N 06°28.3'W	SpMeg
52	22	N end of Sula Skerry, Loch Bracadale, Skye	NG 314 380	57°21.2'N 06°27.8'W	Ven.Neo; XKScrR; Phy
52	23	Between Tarner Island and Colbost Point, Loch Bracadale, Skye	NG 302 393	57°21.9'N 06°29.2'W	IMX
52	24	Mouth of Loch Caroy, Sgeir a' Chuain, Loch Bracadale, Skye	NG 298 408	57°22.6'N 06°29.7'W	VirOph; IGS; Lhyp.Ft; Lhyp.Pk
52	25	Head of Loch Caroy, Loch Bracadale, Skye	NG 303 423	57°23.5'N 06°29.2'W	EcorEns
52	26	E side of Harlosh Point, Loch Bracadale, Skye	NG 287 404	57°22.4'N 06°30.8'W	Lhyp.Ft; AlcByH
52	27	S point of Harlosh Island, Loch Bracadale, Skye	NG 276 382	57°21.2'N 06°31.7'W	Oph; Lhyp.Ft
52	28	Mid point of Loch Vatten, Loch Bracadale, Skye	NG 272 418	57°23.1'N 06°32.3'W	LhypGz
52	29	Loch Bharcasaig, Loch Bracadale, Skye	NG 261 419	57°23.1'N 06°33.5'W	Loon; EcorEns; LhypLsac
52	30	Cliffs under Beinn na Boineid, Loch Bracadale, Skye	NG 259 396	57°21.9'N 06°33.4'W	Loon; LhypGz.Ft

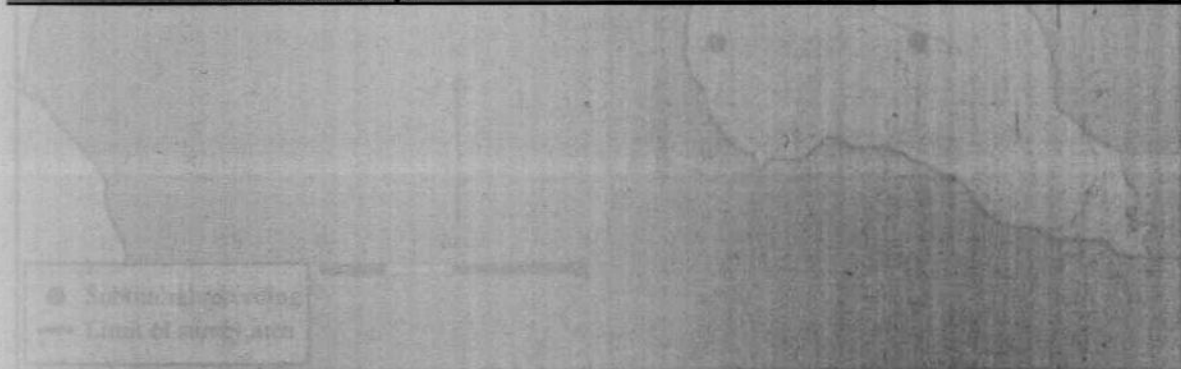


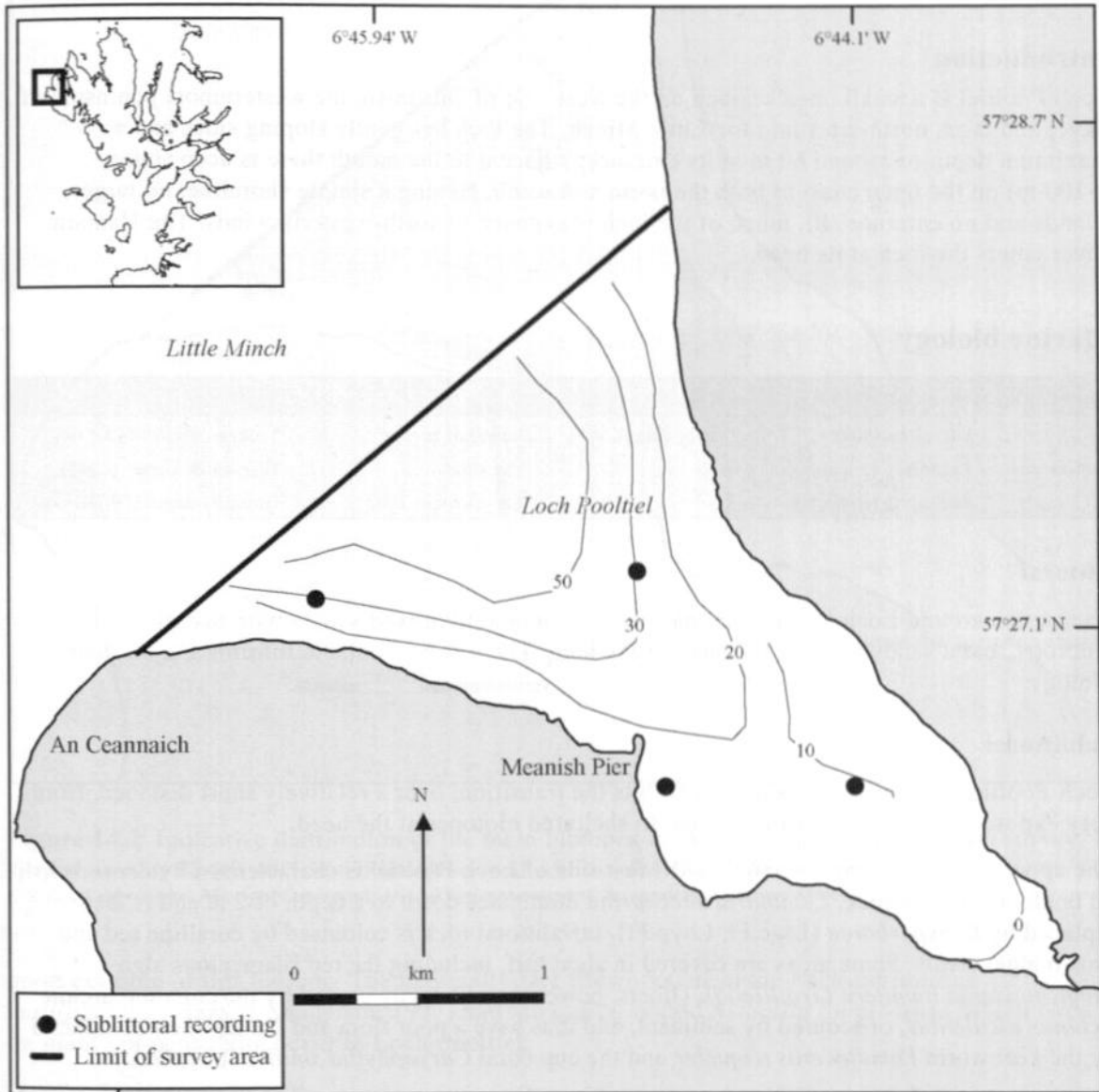
Figure 14.1. Main features of the Lochs Bracadale and Harport area. The survey sites are marked with dots. The limit of the survey area is indicated by a dashed line.

14

## Loch Pooltiel

## Location

Position (centre)	NG 155 508	57°27.7'W 06°44'N
Administrative area	Highland	Skye and Lochalsh
Conservation agency/area	Scottish Natural Heritage	North Areas



**Figure 14.1** Main features of the area, showing sites surveyed.

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**Physical features**

<i>Physiographic type</i>	Open sealoch
<i>Length of coast</i>	8.7 km
<i>Length of inlet</i>	3.5 km
<i>Area of inlet</i>	3.9 km <sup>2</sup>
<i>Bathymetry</i>	Maximum depth approximately 60 m at entrance, shelving towards head of loch
<i>Wave exposure</i>	Moderately exposed; sheltered at head of loch
<i>Tidal streams</i>	Weak throughout loch
<i>Tidal range</i>	4.5 m (mean springs); 1.7 m (mean neaps) (Loch Dunvegan)
<i>Salinity</i>	Fully marine

**Introduction**

Loch Pooltiel is a small open sealoch on the west side of Duirinish, the westernmost peninsula of Skye, and faces north-west into the Little Minch. The loch has gently sloping sides and a maximum depth of around 60 m at its entrance; adjacent to the mouth there is deep water (>100 m) on the open coast to both the north and south. Having a simple shoreline, no large islands and no entrance sill, much of the loch is exposed to north-westerly winds. The Hamara River enters the loch at its head.

**Marine biology****Marine biological surveys**

	<i>Survey methods</i>	<i>No. of sites</i>	<i>Date(s) of survey</i>	<i>Source</i>
<i>Sublittoral</i>	Recording (epibiota)	3	June 1988	Hiscock & Covey (1991)
	Recording (epibiota)	1	May–October 1987	Green & Green (1987)

**Littoral**

The shores around Loch Pooltiel are narrow, predominantly mixed shores with occasional rocky outcrops, and a sandy plain at the head of the loch. There is no available information on their biology.

**Sublittoral**

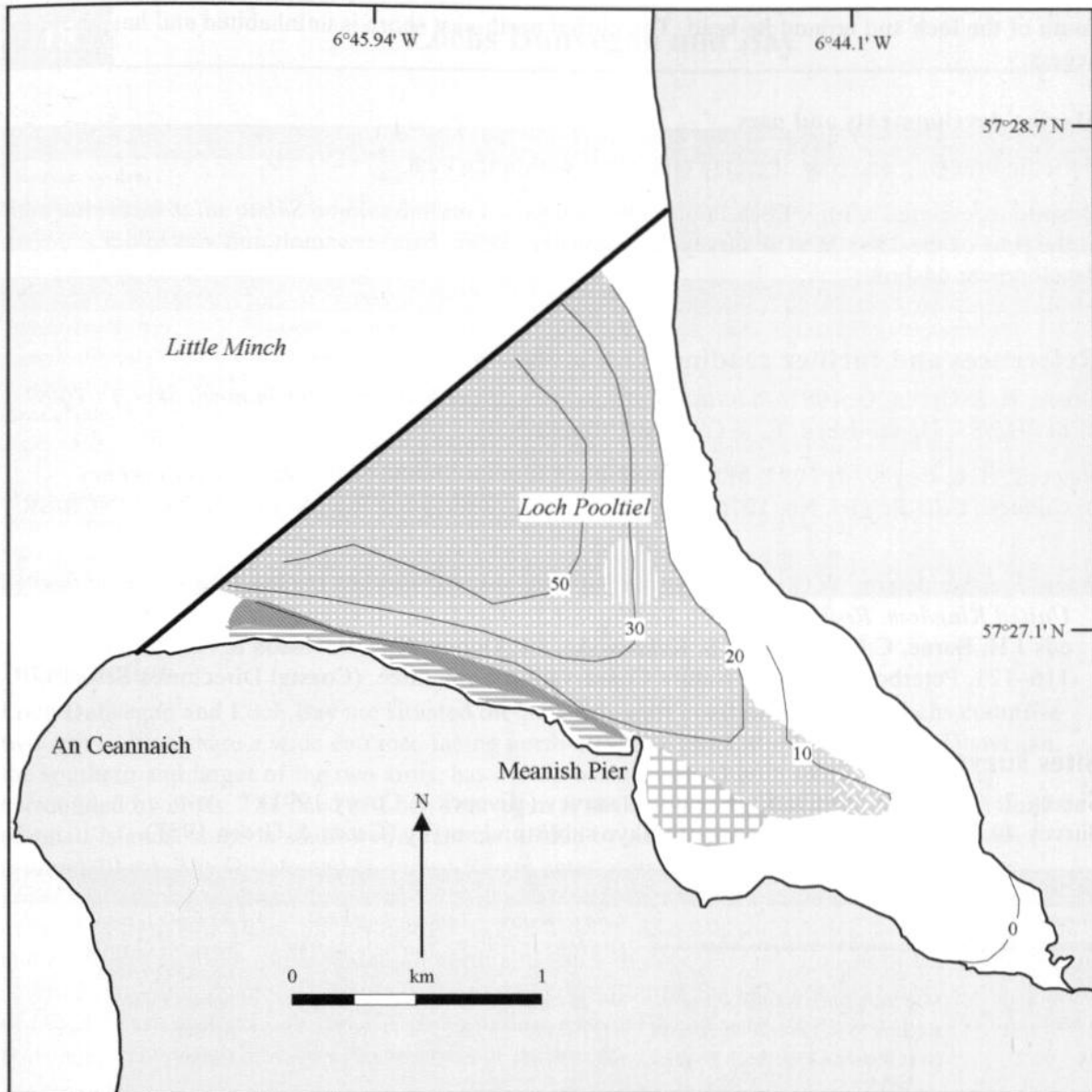
Loch Pooltiel is a small sealoch and exhibits the transition, over a relatively short distance, from very exposed biotopes in the outer loch, to sheltered biotopes at the head.

The upper infralittoral on the outer south-west side of Loch Pooltiel is characterised by dense kelp on boulders and bedrock; *Laminaria saccharina* dominates down to a depth of 2 m and is then replaced by *L. hyperborea* (Lsac.Ft; Lhyp.Ft). Infralittoral rock is colonised by coralline red and brown algal crusts. Some areas are covered in algal turf, including the red filamentous alga *Bonnemaisonia hamifera* (*Trailliella*). Others, however, are heavily grazed by the common urchin *Echinus esculentus*, or scoured by sediment, and thus have a poor flora and fauna, often dominated by the keel worm *Pomatoceros triquetter* and the cup coral *Caryophyllia smithii* (LhypGz).

Bedrock and boulders in the upper infralittoral descend to coarse sand with scattered cobbles and pebbles. At the entrance to Loch Pooltiel, this sand is slightly tide-swept and thus supports a diversity of algal species including *Desmarestia aculeata*, *Porphyra* sp., *Brongniartella byssoides*, *Nitophyllum* sp., *Scinaia turgida* and *Bonnemaisonia asparagoides*. The burrowing anemone *Cerianthus lloydii* is abundant and the bristleworm *Myxicola* sp., the anemone *Peachia cylindrica* and razor clams *Ensis* sp. are also present.

The basin of Loch Pooltiel, from around 13–30 m depth, consists of mud. The mud contains burrows of Norway lobsters *Nephrops norvegicus* and all three British species of sea-pen, *Virgularia mirabilis*, *Pennatula phosphorea* and *Funiculina quadrangularis* (SpMeg.Fun), and is a





**Figure 14.2** Indicative distribution of the main biotopes in the area (based on data from survey sites shown in Figure 14.1, cited literature and additional field observations).

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good example of this biotope. The nationally rare fireworks anemone *Pachycerianthus multiplicatus* (Plaza & Sanderson 1997) and the scarce isopod *Astacilla longicornis*, which lives on giant sea-pens, both occur in Loch Pooltiel.

### Nature conservation

There are no designated conservation sites in the area at present.

### Human influences

#### Coastal developments and uses

Apart from Meanish pier on the south side of Loch Pooltiel, the mainly steep shores have little development. The B884 and minor roads serve Meanish pier and scattered small settlements to the

south of the loch and around its head. The cliffed north-east shore is uninhabited and has no road access.

### Marine developments and uses

Periodic dredging and trawling may take place within the loch.

Despite its exposed nature, Loch Pooltiel has a licensed marine salmon *Salmo salar* farm site, and at the time of the 1988 MNCR survey, a freshwater salmon hatchery/smolt unit was under development onshore.

### References and further reading

Green, E. & Green, G. 1987. *Sublittoral observations from four dive sites in north Skye 15/10/87 to 7/10/87*. Unpublished, E. & G. Green, Cumbria.

Hiscock, S. & Covey, R. 1991. Marine biological surveys around Skye. *Nature Conservancy Council, CSD Report*, No. 1076. (Marine Nature Conservation Review Report, No. MNCR/SR/3.)

Plaza, J. & Sanderson, W.G. 1997. Chapter 5.4 Rare sea-bed species. In *Coasts and seas of the United Kingdom. Regions 15 & 16 North-west Scotland: the Western Isles and west Highland*, eds J.H. Barne, C.F. Robson, S.S. Kaznowska, J.P. Doody, N.C. Davidson & A.L. Buck, 116–121. Peterborough, Joint Nature Conservation Committee. (Coastal Directories Series.)

### Sites surveyed

Survey 2: 1988 MNCR Skye sealochs survey (Hiscock & Covey 1991).

Survey 44: 1985–1987 Green north Skye sublittoral survey (Green & Green 1987).

Sublittoral sites						
Survey	Site	Place	Grid reference	Latitude/longitude	Biotopes recorded	
2	30	SW entrance, Loch Pooltiel, Skye	NG 142 512	57°27.6'N 06°45.9'W	Lhyp.Ft; LhypGz; LSac.FT; LsacX	
2	31	Mid loch, Loch Pooltiel, Skye	NG 154 513	57°27.7'N 06°44.8'W	SpMeg.Fun	
2	32	Head of loch, Loch Pooltiel, Skye	NG 162 505	57°27.3'N 06°43.9'W	SpMeg	
44	5	Near Meanish Pier, Loch Pooltiel, Skye	NG 155 505	57°27.3'N 06°44.6'W	FaSwV	

**Location**

<i>Position (centre)</i>	NG 211 549	57°29.7'W 06°38.8'N
<i>Administrative area</i>	Highland	Skye and Lochalsh
<i>Conservation agency/area</i>	Scottish Natural Heritage	North Areas

**Physical features**

<i>Physiographic type</i>	Open sealoch; northern arm of Loch Dunvegan is fjardic, delimited by islands and sill
<i>Length of coast</i>	59.4 km (80.6 km including islands)
<i>Length of inlet</i>	14.8 km
<i>Area of inlet</i>	55.1 km <sup>2</sup> (53.7 km <sup>2</sup> excluding islands)
<i>Bathymetry</i>	Entrance to Loch Dunvegan 130 m deep; maximum depth of basin of northern arm 50 m; depth of basin of southern arm >90 m; sills delimiting northern arm 17 m and 24 m
<i>Wave exposure</i>	Very exposed at mouth; sheltered at heads of both lochs
<i>Tidal streams</i>	Very weak but slightly stronger around Rubha Maol and Dunvegan Head
<i>Tidal range</i>	4.5 m (mean springs); 1.7 m (mean neaps) (Loch Dunvegan)
<i>Salinity</i>	Fully marine throughout

**Introduction**

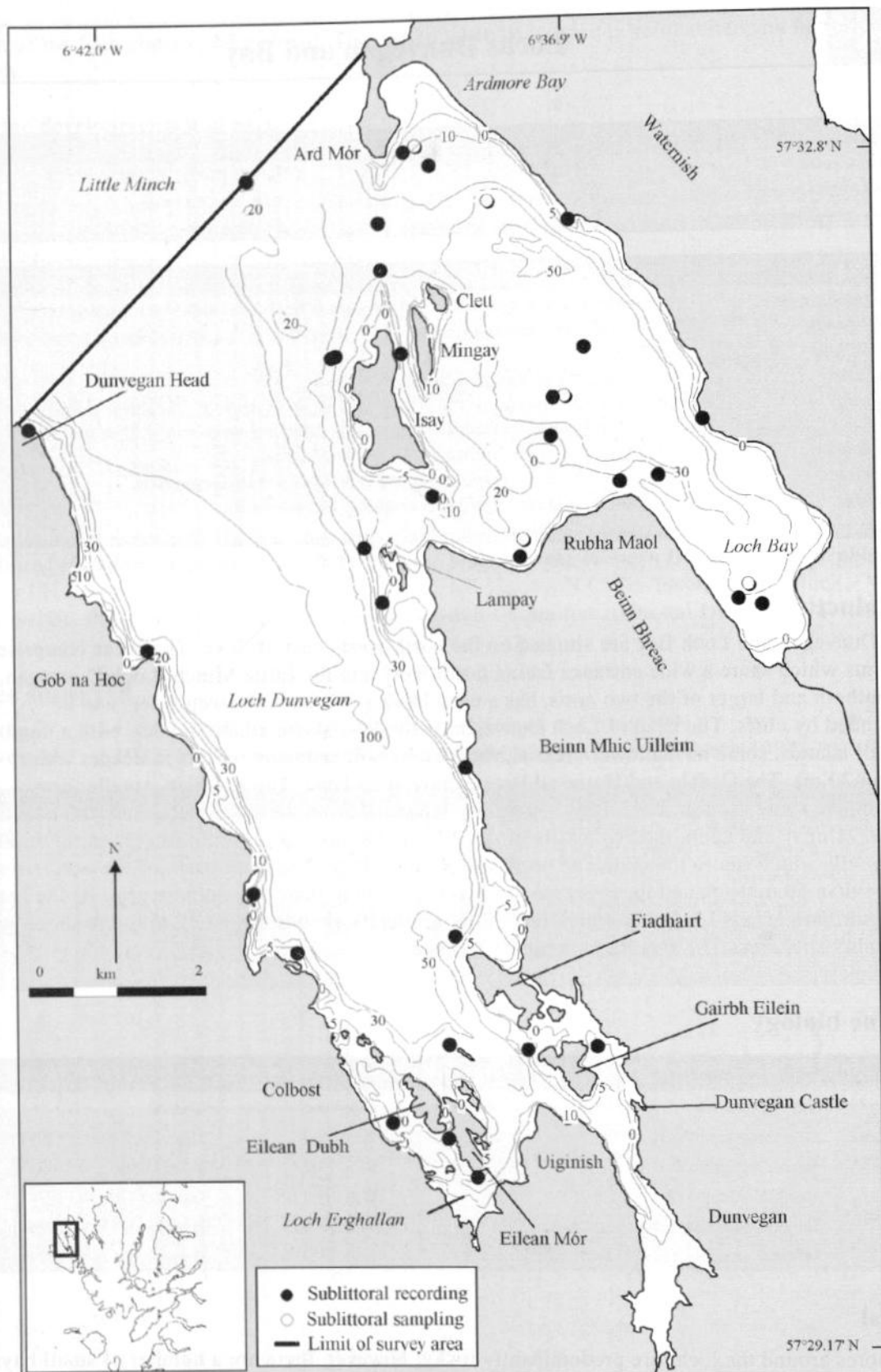
Loch Dunvegan and Loch Bay are situated on the north-west coast of Skye. The lochs comprise two arms which share a wide entrance facing north-west into the Little Minch. Loch Dunvegan, the southern and larger of the two arms, has a deep basin (>90 m) with steep sides, and is surrounded by cliffs. The head of Loch Dunvegan is shallow, sheltered and muddy with a number of small islands, some in shallower areas surrounded by soft sediment, others in deeper water (around 20 m). The Osdale and Horneval Rivers enter at its head. The northern, smaller arm including its inner section, Loch Bay, is partially separated from the southern arm by the islands of Isay, Mingay and Clett, the peninsulas of Ard Mór in the north and Beinn Bhreac in the south, and by sills which run to the mainland north and south of Isay. The main basin of the northern arm is more than 50 m deep, and its edges are more gently sloping than the southern arm. At the head of the northern arm is Loch Bay which is shallow, gradually shelving from 32 m to the shore, and reasonably sheltered. The Bay River enters at its head.

**Marine biology****Marine biological surveys**

	<i>Survey methods</i>	<i>No. of sites</i>	<i>Date(s) of survey</i>	<i>Source</i>
<i>Sublittoral</i>	Recording (epibiota)	10	June 1988	Hiscock & Covey (1991)
	Recording (epibiota)	21	May 1988	Holt (1988)
	Recording (epibiota)	2	October 1987	Green & Green (1987)
	Infaunal sampling (suction sampler)	4	June 1988	Hiscock & Covey (1991)
	Infaunal sampling (biological dredge)	1	June 1988	Hiscock & Covey (1991)

**Littoral**

The shores around the lochs are predominantly rocky; however, there are a number of small bays and indentations composed of gravel and sand and, in the very sheltered areas at the head of Loch Dunvegan, mud. There is little available information on the biology of the shores. Areas surveyed show typical sheltered shores towards the head of the southern arm, with knotted wrack *Ascophyllum nodosum* on large boulders with mud (Asc). Towards the entrance to the loch, in the



**Figure 15.1** Main features of the area, showing sites surveyed.

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sheltered area between Isay and Mingay, *A. nodosum* is found on mixed substrata, with sea lettuce *Ulva* sp., bootlace weed *Chorda filum* and kelp *Laminaria digitata* in the shallow sublittoral.

## Sublittoral

### Infralittoral rock

Bedrock and boulder slopes of much of the upper infralittoral within the outer part of the loch system support dense *Laminaria hyperborea* kelp forest to depths of around 15 m (Lhyp.Ft), below a fringe of *L. digitata* (Ldig.Ldig). In more sheltered areas, where there is finer sediment in the fissures and crevices of igneous bedrock, such as off Rubha Maol and north and west of Isay, *Laminaria saccharina* may also be present to depths of around 17 m. Towards the heads of Loch Dunvegan and Loch Bay, *L. saccharina* becomes dominant on some infralittoral rock surfaces where it extends to depths of around 10 m. Occasional plants of *L. saccharina* and *L. hyperborea* are also found on boulders within the mud-plains at the head of both lochs (LsacX). These areas also support the sponges *Halichondria panicea* and *Suberites carnosus* and the ascidian *Ascidiella aspera*. Where infralittoral rock is scoured by sand, off the east and south-west shores of inner Loch Dunvegan, the annual kelp *Saccorhiza polyschides* occurs. In some areas, kelp stipes and rock surfaces support a rich red algal understorey. Algae are particularly diverse on the slightly tide-swept sills to the north and south of Isay. Other areas of infralittoral rock are grazed by urchins *Echinus esculentus* and here rock surfaces have few red algae and are covered in coralline algal crusts (LhypGz.Pk). Species associated with the dense kelp forest include the featherstar *Antedon bifida*, ascidians *Ciona intestinalis* and *Ascidia mentula*, the cup coral *Caryophyllia smithii* and starfish *Asterias rubens*, and the mollusc *Marthasterias glacialis* and sunstar *Crossaster papposus*.

### Circalittoral rock

Circalittoral bedrock outcrops and boulders, at depths of below 20 m, support featherstars, sponges and ascidians. Outcrops off the northern part of the loch mouth are subject to stronger tidal streams, and have a particularly diverse fauna. Rocks here are covered in featherstars, including all three British shallow-water species *Antedon bifida*, *A. petasus* and *Leptometra celtica*, patches of the ascidian *Ciona intestinalis* and erect calcareous bryozoans (ErSSwi). Bedrock off Rubha Maol is covered in large plumose anemones *Metridium senile* and featherstars. Boulders within the muddy sand off Lampay Island support the northern sea-fan *Swiftia pallida* and ascidians.

### Infralittoral sediment

Around Isay where tidal streams are moderate, sediment in the lower infralittoral is generally coarse and clean. Within the coarse sand south and north-west of Isay at depths of around 16 m, there is also maerl, although much of it is dead. Here, the shell and maerl sand supports a species-rich biotope of foliose red and brown algae, clumps of hydroids, the anemone *Cerianthus lloydii*, the sea cucumber *Neopentadactyla mixta* and patches of featherstars *Antedon bifida* (Phy.HEc). Coarse gravels and pebbles in the lower infralittoral off Dunvegan Head are also tide-swept. These gravels support a very rich biota, and communities here have been provisionally identified as of regional or national conservation importance and the area is recognised as a Marine Consultation Area. Ephemeral foliose red algae, which can grow rapidly in such a highly mobile environment, and a rich fauna including crabs, nudibranchs, ascidians and a thick hydroid turf are present (EphR). The gravel beds also support the burrowing anemone *Peachia cylindrica*, the sea-slug *Philine pruinosa*, the locally rare anemone *Stomphia coccinea* and the nationally rare brown seaweed *Desmarestia dresnayi* (Plaza & Sanderson 1997). Muddy sand and gravel within more sheltered bays around the loch system support burrowing anemones and bivalves in the upper infralittoral, with the sea-pen *Virgularia mirabilis* and the sea hare *Aplysia punctata* present in finer sediment at depth (PhiVir). Infralittoral muddy sand within Ardmore Bay supports

occasional kelp *Laminaria saccharina* and filamentous brown and foliose red algae to around 13 m depth (LsacX).

The heads of both Loch Dunvegan and Loch Bay comprise areas of soft, fine mud. Much of the shallower mud at the head of Loch Dunvegan is covered in filamentous brown algae and a diatomaceous ooze. Where shallow mud is scattered with boulders, kelp *Laminaria hyperborea* is present.

#### *Circalittoral sediment*

Muddy sand with shells in the circalittoral off Isay supports a diversity of species. Epifauna present include the sea anemone *Epizoanthus couchii*, ascidians *Polycarpa pomaria* and *Ascidia virginea*, the sponge *Suberites ficus*, sea-pens *Virgularia mirabilis* and *Pennatula phosphorea*, unattached cup corals *Caryophyllia smithii* and the burrowing anemone *Halcampa chrysanthellum*. Further into the lochs, circalittoral muddy sand is less diverse. There are areas covered in featherstars *Antedon petasus* and brittlestars *Ophiura ophiura* and the ascidian *Ascidella aspersa*, while finer, firmer sediment supports *P. phosphorea*, *V. mirabilis* and the burrowing anemone *Cerianthus lloydii* at depths of around 30 m (VirOph.HAs). In both lochs, coarser sediment descends to fine mud with burrowing megafauna, including the crustaceans *Callianassa subterranea* and *Calocaris macandreae*, all three British sea-pen species *V. mirabilis*, *P. phosphorea* and *Funiculina quadrangularis*, swimming crabs *Liocarcinus* sp. and heart urchins *Echinocardium* sp. (SpMeg).

At the head of both lochs, below depths of around 4–10 m, the mud supports predominantly animal-dominated communities similar to those found in the deep loch basins, with Norway lobsters *Nephrops norvegicus*, *C. macandreae*, *C. subterranea*, the sea-slug *Philine aperta*, sea-pens, *C. lloydii* and patches of *O. ophiura* (VirOph).

A number of rare species have been recorded from Loch Dunvegan and Loch Bay. Dunvegan Head is the northern limit of the nationally rare brown seaweed *Desmarestia dresnayi* (Plaza & Sanderson 1997). The anemone *Stomphia coccinea* is found in gravel beds off Dunvegan Head and the anemone *Halcampa chrysanthellum* is present in the mouth of Loch Bay. The mollusc *Janthina pallida* and the deep-water featherstar *Leptometra celtica* have also been recorded within the loch system.

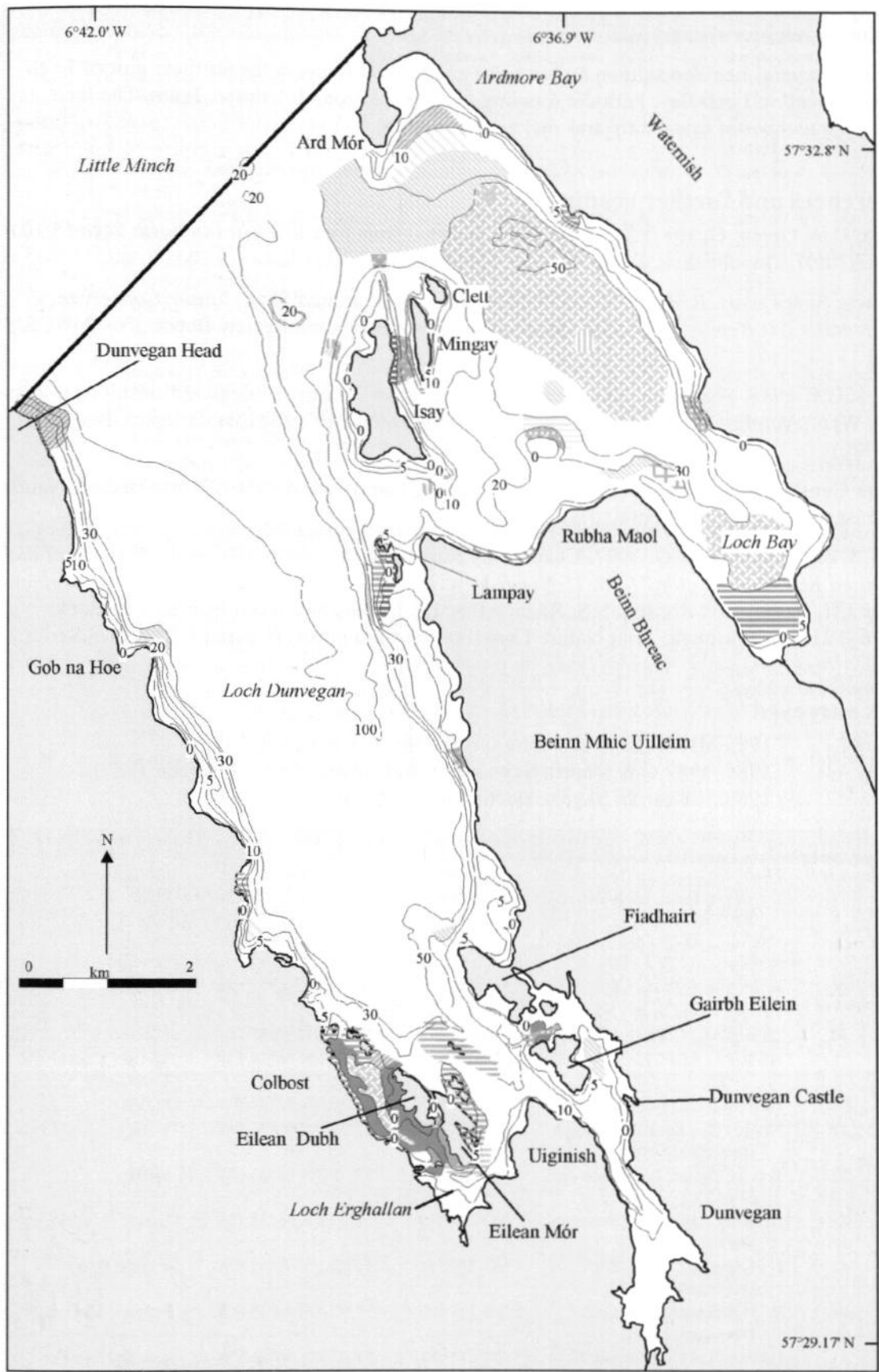
## Nature conservation

Conservation sites		
Site name	Status	Main features
Dunvegan Head	MCA	Marine biological

## Human influences

### Coastal developments and uses

Roads around much of the loch system serve a number of scattered settlements around both shores of inner Loch Dunvegan, the largest being the village of Dunvegan at its head, and along the whole northern shore. The steep slopes of Beinn Bhreac and Dunvegan Head are uninhabited with no road access. Most of the surrounding land supports crofting and rough grazing, but there are forestry plantations near the heads of the lochs. There is some development along the shore at Dunvegan; elsewhere the shores are natural apart from a few slipways and piers, including those at Colbost, Uiginish and Dunvegan. Tourism is important to the area, and Dunvegan Castle on the loch shore is one of Skye's major attractions.



**Figure 15.2** Indicative distribution of the main biotopes in the area (based on data from survey sites shown in Figure 15.1, cited literature and additional field observations).  
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### Marine developments and uses

There are several licensed salmon *Salmo salar* and scallop farms in the northern part of Loch Dunvegan and in Loch Bay. Periodic trawling takes place around Ardmore Point. The loch contains a number of interesting and sheltered dive sites.

### References and further reading

- Green, E. & Green, G. 1987. *Sublittoral observations from four dive sites in north Skye 15/10/87 to 7/10/87*. Unpublished, E. & G. Green, Cumbria.
- Hiscock, S. & Covey, R. 1991. Marine biological surveys around Skye. *Nature Conservancy Council, CSD Report*, No. 1076. (Marine Nature Conservation Review Report, No. MNCR/SR/3.)
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- Nature Conservancy Council. 1990. *Marine Consultation Areas: Scotland*. Unpublished, Nature Conservancy Council (Scotland), Edinburgh.
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### Sites surveyed

- Survey 2: 1988 MNCR Skye sealochs survey (Hiscock & Covey 1991).
- Survey 44: 1985–1987 Green north Skye sublittoral survey (Green & Green 1987).
- Survey 52: 1988 Seasearch: Skye sealochs sublittoral survey (Holt 1988).

Sublittoral sites					
Survey	Site	Place	Grid reference	Latitude/longitude	Biotores recorded
2	33	Dunvegan Head, Loch Dunvegan, Skye	NG 178 568	57°30.8'N 06°42.7'W	EphR
2	34	NW Isay Island, Loch Dunvegan, Skye	NG 213 576	57°31.3'N 06°39.3'W	Phy.HEc
2	35	N of Groban na Sgeire, Loch Dunvegan, Skye	NG 224 560	57°30.5'N 06°38.1'W	Phy.HEc
2	36	Lovaig Bay, Loch Dunvegan, Skye	NG 234 553	57°30.2'N 06°37.1'W	EcorEns
2	37	NE Rubha Maol, Loch Bay, Skye	NG 250 562	57°30.7'N 06°35.5'W	VirOph; CorMetAlc; LhypGz.Pk
2	38	Head of loch, Loch Bay, Skye	NG 259 548	57°30.0'N 06°34.5'W	PhiVir
2	39	NNE of Sgeir nam Bìast, Loch Dunvegan, Skye	NG 238 571	57°31.1'N 06°36.8'W	VirOph
2	40	Port na Cagain, Loch Dunvegan, Skye	NG 231 593	57°32.3'N 06°37.6'W	SpMeg
2	41	Ardmore Bay, Loch Dunvegan, Skye	NG 221 599	57°32.6'N 06°38.7'W	LsacX
2	42	N of Sgeir a' Chuain, Loch Dunvegan, Skye	NG 218 591	57°32.1'N 06°38.9'W	VirOph.HAs
2	43	W of Ardmore Point, Loch Dunvegan, Skye	NG 203 596	57°32.4'N 06°40.4'W	ErSSwi; VirOph
44	1	Halistra, Loch Dunvegan, Skye	NG 240 591	57°32.2'N 06°36.7'W	LsacX; Lhyp.Ft
44	2	S of pier, Husabost, Loch Dunvegan, Skye	NG 203 515	57°28.0'N 06°39.9'W	Ldig.Ldig; Lhyp
52	31	W of Beinn Mhic Uilleim, Loch Dunvegan, Skye	NG 227 529	57°28.9'N 06°37.5'W	IGS; CGS; Sac



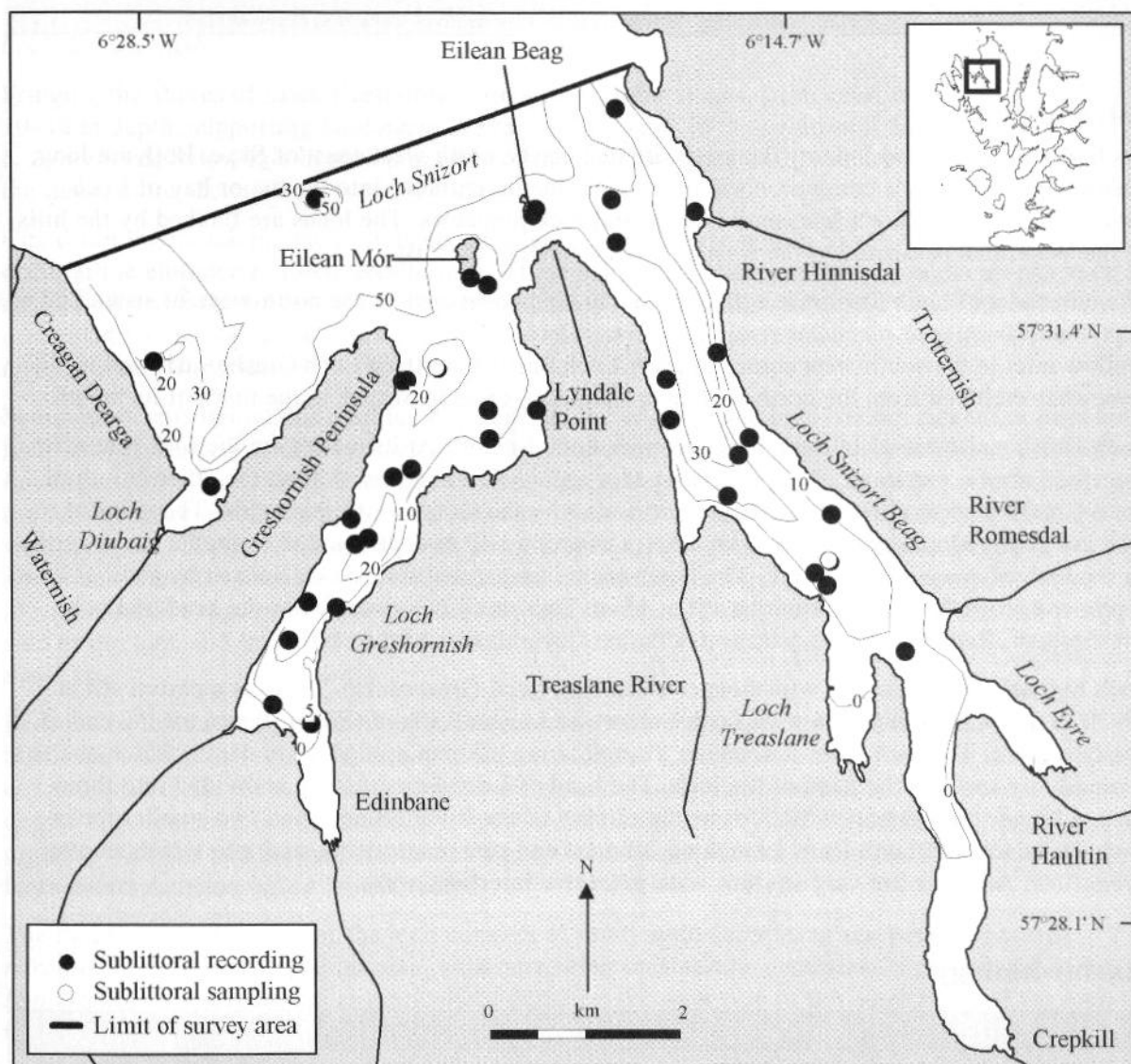
<b>Sublittoral sites</b>					
<i>Survey</i>	<i>Site</i>	<i>Place</i>	<i>Grid reference</i>	<i>Latitude/longitude</i>	<i>Biotores recorded</i>
52	32	S end of Lampay Island, Loch Dunvegan, Skye	NG 218 548	57°29.8'N 06°38.6'W	CMS; ErSSwi; Lhyp.Pk
52	33	Gob na Hoe, Loch Dunvegan, Skye	NG 191 542	57°29.5'N 06°41.3'W	VirOph; LhypGz; AntAsH
52	34	Leinish Bay, Loch Dunvegan, Skye	NG 207 508	57°27.7'N 06°39.3'W	AmenCio
52	35	N Fiadhairt Point, Loch Dunvegan, Skye	NG 226 510	57°27.8'N 06°37.6'W	AmenCio; VirOph
52	36	NW tip of Bo-Mor Island, Loch Dunvegan, Skye	NG 225 497	57°27.2'N 06°37.6'W	AmenCio; IMS; Lsac.Ft; Lsac.Pk
52	37	W side of Eilean Mór, Eilean Dubh & Loch More, Loch Dunvegan, Skye	NG 225 487	57°26.6'N 06°37.5'W	SpMeg; IMU; Lhyp
52	38	Around Loch More, Loch Dunvegan, Skye	NG 218 488	57°26.7'N 06°38.2'W	SpMeg; FaSwV; IMS; IMU; Lhyp.Ft
52	39	Loch Erghallan (N of Carn Mór), Loch Dunvegan, Skye	NG 228 482	57°26.4'N 06°37.2'W	SpMeg; LhypLsac
52	40	Between Gairbh Eilein and Fiadhairt peninsula, Loch Dunvegan, Skye	NG 234 497	57°27.2'N 06°36.7'W	SIR; SpMeg; IMX; Asc; Ldig.Ldig.Bo
52	41	Landward side of Gairbh Eilein, Loch Dunvegan, Skye	NG 242 497	57°27.2'N 06°35.9'W	SpMeg
52	42	W side of Isay Island, Loch Dunvegan, Skye	NG 212 575	57°31.3'N 06°39.4'W	KR; Ven.Neo
52	43	N tip of Isay Island, Loch Dunvegan, Skye	NG 218 585	57°31.9'N 06°38.9'W	KR; CorMetAlc
52	44	Isay Island channel, Loch Dunvegan, Skye	NG 220 576	57°31.4'N 06°38.6'W	Fser.Fser.Bo; Ldig.Ldig.Bo; LsacX
52	45	NW tip of Lampay Island, Loch Dunvegan, Skye	NG 216 554	57°30.2'N 06°38.9'W	Fser.Fser.Bo; Ldig.Ldig.Bo; Lhyp
52	46	Sgeir nam Biast, Loch Dunvegan, Skye	NG 237 566	57°30.9'N 06°36.8'W	IMX; Ldig; Oph; Lsac
52	47	Offshore from Sgùrr a' Bhàgh, Loch Bay, Loch Dunvegan, Skye	NG 245 561	57°30.7'N 06°36.0'W	VirOph.HAs
52	48	Head of Loch Bay, Loch Dunvegan, Skye	NG 261 547	57°30.0'N 06°34.2'W	SpMeg
52	49	Oans Point, Loch Bay, Loch Dunvegan, Skye	NG 255 568	57°31.1'N 06°35.0'W	IMX
52	50	Mid-basin, Loch Bay, Loch Dunvegan, Skye	NG 241 576	57°31.5'N 06°36.5'W	SpMeg.Fun
52	51	Ardmore Bay, Loch Dunvegan, Skye	NG 224 597	57°32.5'N 06°38.4'W	AmenCio; VirOph

## 16

## Lochs Greshornish and Snizort Beag

## Location

Position (centre)	NG 338 548	57°30.7'W 06°25'N
Administrative area	Highland	Skye and Lochalsh
Conservation agency/area	Scottish Natural Heritage	North Areas



**Figure 16.1** Main features of the area, showing sites surveyed.

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Physical features	
<i>Physiographic type</i>	Fjordic sealochs
<i>Length of coast</i>	58.1 km (59.8 km including islands)
<i>Length of inlet</i>	11.4 km
<i>Area of inlet</i>	26.3 km <sup>2</sup> (26.2 km <sup>2</sup> excluding islands)
<i>Bathymetry</i>	Maximum depth approx. 70 m at mouth of lochs. Greshornish has two basins of 40 m and 25 m depth, separated by two sills at 27 m and 13 m respectively. Snizort Beag has long basin of 40 m depth, with sill at 30 m
<i>Wave exposure</i>	Moderate at the mouth of the lochs into Loch Snizort; very sheltered at heads of both lochs
<i>Tidal streams</i>	Weak throughout
<i>Tidal range</i>	4.6 m (mean springs); 1.6 m (mean neaps) (Uig Bay)
<i>Salinity</i>	Fully marine; may be slightly reduced at heads of lochs after heavy rainfall

## Introduction

Lochs Greshornish and Snizort Beag are situated on the north-west coast of Skye. Both are long, narrow sealochs with a common north-north-west-facing entrance into the major bay of Loch Snizort, where there are a few small islands and rock pinnacles. The lochs are flanked by the hills of the Waternish peninsula to the west and Trotternish to the east.

The inner part of Loch Snizort is a predominantly mud basin open to the north-west, of around 60 m depth, with three rock pinnacles rising to 40 m and two to 15 m. Loch Diubaig is a small, open, shallow inlet in the south-west corner of inner Loch Snizort, north of Loch Greshornish, and is somewhat sheltered from the north-west by a sublittoral outcrop of rock to the north of its mouth.

Loch Greshornish opens to the middle of inner Loch Snizort. At its mouth are the rock pinnacles described above, the small island of Eilean Mór and several skerries. All but the outer mouth of Loch Greshornish is sheltered from the north-west by the Greshornish peninsula. The sides of the loch are gently sloping, descending to a basin of around 40 m depth, and to a smaller basin further up the loch of around 25 m depth. The outer basin is separated from Loch Snizort by a sill at 27 m depth, and from the inner basin by a sill at 13 m. Two small rivers enter the head of Loch Greshornish, Red Burn to the west and Abhainn Choishleadar to the east.

Loch Snizort Beag is larger, with steeper sides than Loch Greshornish. There is a partial sill at 20–30 m depth at its junction with Loch Snizort, and a small island (Eilean Beag) off the end of Lyndale Point. The loch sides descend to a single, long basin at around 40 m depth, which shelves gradually up towards the head of the loch. The head of Loch Snizort Beag is divided into three arms, a longer central one, which forms the estuary of the River Snizort, and two smaller lochs, Loch Treaslane and Loch Eyre, branching off west and east respectively, and into which smaller rivers flow. All three are very shallow with extensive intertidal areas.

## Marine biology

Marine biological surveys				
	<i>Survey methods</i>	<i>No. of sites</i>	<i>Date(s) of survey</i>	<i>Source</i>
<i>Sublittoral</i>	Recording (epibiota)	14	June 1988	Hiscock & Covey (1991)
	Recording (epibiota)	20	May 1988	Holt (1988)
	Recording (epibiota)	2	October 1987	Green & Green (1987)
	Infaunal sampling (biological dredge)	1	June 1988	Hiscock & Covey (1991)
	Infaunal sampling (suction sampler)	1	June 1988	Hiscock & Covey (1991)

## Littoral

The shores around Lochs Greshornish and Snizort Beag are narrow and predominantly rocky, with areas of sediment within bays and indentations. The heads of both lochs comprise mud and sand with further large sediment plains within Lochs Diubaig, Treaslane and Eyre. Shores of the

headlands and the two islands at the confluence of the lochs, Eilean Mór and Eilean Beag, are steep and rocky. There is no survey information on the littoral biology of the area.

### Sublittoral

#### *Loch Diubaig*

The seabed of this small loch consists of firm, fine sand with shell fragments at around 10 m depth, with foliose algae covering a large proportion of the sand surface. The fauna is typical for this type of sediment, dominated by the burrowing anemone *Cerianthus lloydii* and lugworm *Arenicola marina*, with frequent burrowing brittlestars *Amphiura* sp. (LsacX).

#### *Loch Greshornish*

Fringing the shores of Loch Greshornish are silty boulder slopes, from chart datum, to around 10–12 m depth, supporting *Laminaria digitata* kelp forests in the sublittoral fringe, with *L. hyperborea* below this in the outer parts of the loch, replaced by *L. saccharina* kelp forests in the inner, more sheltered parts of the loch.

Circalittoral bedrock pinnacles in deep water are relatively rare within Skye sealochs, but several occur at the entrance to Loch Greshornish. These sublittoral cliffs and steep boulder slopes have not been thoroughly surveyed, but support a species-rich animal community, which includes the orange coral-like bryozoan *Porella compressa* and the sponges *Axinella infundibuliformis* and *Hymedesmia paupertas*.

Sediment occurs below this boulder slope around the edges of the loch basins, extending over both loch sills, consisting of muddy sand with terebellid worms and the burrowing anemone *Cerianthus lloydii*, with scallops *Pecten maximus* and *Aequipecten opercularis*. Silty boulders which occur on the sediment are colonised by *L. saccharina* in shallower water (LsacX), or in slightly deeper water support solitary ascidians *Corella parallelogramma* and *Asciella aspersa*, plumose anemones *Metridium senile*, hydroids and dead-man's fingers *Alcyonium digitatum*, with squat lobsters *Munida rugosa* sheltering underneath the boulders. Shallow sediments of the mid-western side of the loch and inner sill support many turret shells *Turritella communis* and razor clams *Ensis* sp.

Bedrock in Lyndale Bay consists of basalt columns with crevices occupied by numerous brittlestars *Ophiothrix fragilis*. Between Eilean Mór and Lyndale Point the sediment is somewhat coarser, with clean shell-gravel in shallow water, and muddy shell-sand down to around 18 m depth. This sediment is not particularly species-rich, colonised by the ubiquitous *C. lloydii* together with red and brown filamentous algae, *T. communis*, spider crabs *Inachus* sp. and featherstars *Antedon bifida* on drift kelp.

The middle of both basins of the loch consists of sandy mud supporting sea-pens *Virgularia mirabilis* and *Pennatula phosphorea*, with burrowing crustaceans occurring in patches (SpMeg). *P. phosphorea* was recorded as particularly dense on the west side of the outer basin of the loch by Green & Green (1987).

A plain of soft mud, subject to freshwater influence, lies in shallow water at the head of Loch Greshornish, and supports terebellid worms and hermit crabs.

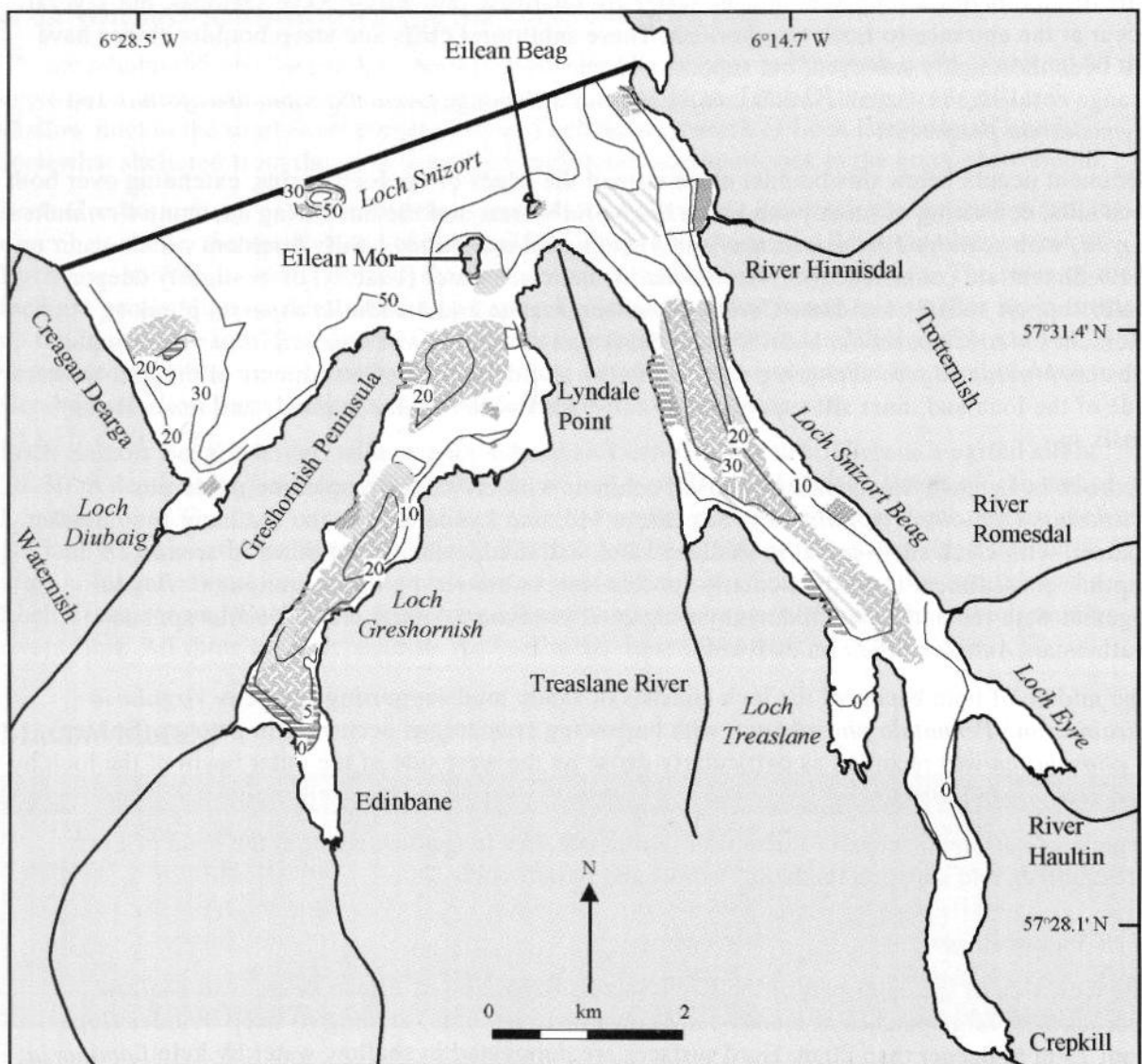
#### *Loch Snizort Beag*

The west side of the outer part of the Loch Snizort Beag, east of Eilean Beag, is of shallow bedrock with large patches of muddy sand down to 15 m depth, grading to steep boulder slopes from 15 m to deeper than 20 m. Hard surfaces are dominated in shallow water by kelp *Laminaria saccharina*, with foliose red algae in deeper water, and below this, solitary ascidians *Ascidia mentula* and *Ciona intestinalis*, hydroids and featherstars *Antedon bifida* on rock, with squat lobsters *Munida rugosa* beneath boulders (AmenCio). The burrowing anemone *Cerianthus lloydii* and the sea cucumber *Pawsonia saxicola* occur on patches of sediment between the rock outcrops

and boulders. From around 20 m to deeper than 30 m, soft muddy sand predominates, with seaweeds *Virgularia mirabilis* and *Pennatula phosphorea*, along with occasional burrows of Norway lobsters *Nephrops norvegicus* (SpMeg).

The sill of Loch Snizort Beag between Lyndale Point and the River Hinnisdal, at around 25 m depth, consists of a slope of silty boulders on mud, with a species-rich ascidian fauna of *A. mentula* and *C. intestinalis* on upper surfaces, with *Ascidia conchilega*, *Pyura tessellata* and *Pyura squamulosa* under boulders, and a wide variety of starfish (AmenCio). The cup coral *Caryophyllia smithii* and bryozoans also occur on the boulders, with *M. rugosa* beneath them. The shallow part of the loch sill, down to 8 m, on the east side near the mouth of the River Hinnisdal is poor in species because of freshwater input from the river. Scattered small boulders support a sparse kelp forest with green algae and bootlace weed *Chorda filum*.

Loch Snizort Beag is similar in nature to Loch Greshornish, with silty boulder slopes, from chart datum to around 5–10 m depth, supporting *Laminaria hyperborea* kelp forests in the outer parts of the loch, replaced by *L. saccharina* kelp forest further into the loch. The annual kelp *Saccorhiza polyschides* occurs on mixed boulders and cobbles at the outer eastern edge of the loch.



**Figure 16.2** Indicative distribution of the main biotopes in the area (based on data from survey sites shown in Figure 16.1, cited literature and additional field observations).

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Sediment occurs below the boulder slopes around the edges of Loch Snizort Beag, consisting of muddy sand with terebellid worms, *C. lloydii* and burrowing brittlestars *Amphiura* sp., with patches of *V. mirabilis* in deeper water. A few scallops *Pecten maximus* are found in the mid-section of the loch, where other large bivalves *Mya truncata*, *Dosinia* sp. and *Arctica islandica* also occur within the sediment. Silty boulders on sediment support *L. saccharina* and foliose red algae in shallower water, or in slightly deeper water support the ascidians *Clavelina lepadiformis* and *Dendrodoa grossularia*, the plumose anemone *Metridium senile* and *C. smithii*, with *P. saxicola* beneath the boulders. The polychaete *Owenia fusiformis* is common in fine sandy mud with *C. lloydii* at around 10 m depth near the mouth of Loch Treaslane. Towards the head of Loch Snizort Beag, the sediment is poor in species, probably due to freshwater input.

The deep sediment basin of Loch Snizort Beag consists of mud and muddy sand, supporting a community characterised by sea-pens *P. phosphorea* and the very tall sea-pen *Funiculina quadrangularis* and burrowing crustaceans *N. norvegicus*, *Calocaris macandreaea* and *Callianassa subterranea*, with burrowing brittlestars *Amphiura* sp. (SpMeg.Fun).

The rarely recorded starfish *Stichastrella rosea* was found by Hiscock & Covey (1991).

### Nature conservation

There are no designated conservation sites in the area at present.

### Human influences

#### Coastal developments and uses

The A850/A856 and minor roads follow much of the coastline, but only near the heads of the lochs are roads adjacent to the shore. Small crofting settlements are scattered along these roads. Much of the land to the south and west is forested, and elsewhere supports rough grazing.

#### Marine developments and uses

There are large salmon and shellfish farms within Loch Greshornish and mussel farm sites licensed in Loch Snizort Beag. Dredging and trawling both take place within the area. Both lochs offer sheltered diving in most weather conditions.

### References and further reading

- Green, E. & Green, G. 1987. *Sublittoral observations from four dive sites in north Skye 15/10/87 to 7/10/87*. Unpublished, E. & G. Green, Cumbria.
- Hiscock, S. & Covey, R. 1991. Marine biological surveys around Skye. *Nature Conservancy Council, CSD Report*, No. 1076. (Marine Nature Conservation Review Report, No. MNCR/SR/3.)
- Holt, R.H.F. 1988. Seasearch: Skye sealochs. (Contractor: Marine Biological Consultants, Ross-on-Wye.) *Nature Conservancy Council, CSD Report*, No. 897. (Seasearch report, No. SS/1/1988.)

### Sites surveyed

- Survey 2: 1988 MNCR Skye sealochs survey (Hiscock & Covey 1991).
- Survey 44: 1985–1987 Green north Skye sublittoral survey (Green & Green 1987).
- Survey 52: 1988 Seasearch: Skye sealochs sublittoral survey (Holt 1988).

Sublittoral sites					
Survey	Site	Place	Grid reference	Latitude/longitude	Biotopes recorded
2	50	N of Gob Uisgebrigh, Loch Snizort, Skye	NG 325 560	57°30.9'N 06°28.0'W	SpMeg; FaAlC; Lsac.Pk
2	51	Loch Diubaig, Loch Snizort,	NG 331 547	57°30.2'N 06°27.3'W	LsacX
2	52	Pinnacle NW of Greshornish Point, Loch Snizort, Skye	NG 342 577	57°31.8'N 06°26.4'W	SS; FaAlC
2	53	E of Sgeir an D-in, Loch Greshornish, Skye	NG 355 559	57°30.9'N 06°25.0'W	SpMeg
2	54	Inner Sill, Loch Greshornish,	NG 350 548	57°30.3'N 06°25.4'W	VirOph.HAs
2	55	E of Creag Bhuidhe, Loch Greshornish, Skye	NG 346 541	57°29.9'N 06°25.8'W	SpMeg
2	56	W of Crachan Rock, Loch Greshornish, Skye	NG 339 531	57°29.4'N 06°26.4'W	VirOph.HAs
2	57	Lyndale Bay, Loch Greshornish, Skye	NG 360 555	57°30.7'N 06°24.5'W	LsacX; Lsac.Pk; LhypGz.Pk
2	58	Channel E of Eilean Mór, Loch Snizort, Skye	NG 360 568	57°31.4'N 06°24.6'W	VirOph.HAs
2	59	Eilean Beag channel, Loch Snizort, Skye	NG 365 576	57°31.9'N 06°24.1'W	AmenCio; SpMeg
2	60	E of Lyndale Point, Loch Snizort, Skye	NG 373 577	57°31.9'N 06°23.3'W	AmenCio
2	61	N of Seal Rock, Loch Snizort Beag, Skye	NG 379 554	57°30.7'N 06°22.6'W	Sac; LhypLsac.Ft; LsacX
2	62	Mid-loch, Loch Snizort Beag, Skye	NG 385 546	57°30.3'N 06°21.9'W	SpMeg.Fun; AmenCio.Met
2	63	NE of Odhar Sgeir, Loch Snizort Beag, Skye	NG 394 538	57°29.9'N 06°21.0'W	VirOph
44	3	Outer loch, Loch Greshornish,	NG 351 558	57°30.8'N 06°25.4'W	SIR; IGS
44	4	Inner loch, Loch Greshornish, Skye	NG 341 535	57°29.6'N 06°26.3'W	SS; Asc.Asc; Lsac.Ldig
52	52	Channel between Lyndale Point and Eilean Beag Greshornish, Loch Greshornish, Skye	NG 364 575	57°31.8'N 06°24.1'W	AmenCio; IMS; Lsac.Pk
52	53	Eilean Mór, Loch Greshornish,	NG 358 568	57°31.5'N 06°24.8'W	IMX; LhypLsac.Pk
52	54	Sgeir an Dùin, Loch Greshornish, Skye	NG 351 558	57°30.9'N 06°25.4'W	CMS
52	55	Mid channel, Loch Greshornish, Skye	NG 347 541	57°30.0'N 06°25.7'W	VirOph.HAs; AmenCio.Met
52	56	Head of loch, near Red Burn, Loch Greshornish, Skye	NG 337 524	57°29.0'N 06°26.6'W	SpMeg; LsacX
52	57	Head of loch near Edinbane, Loch Greshornish, Skye	NG 341 522	57°28.9'N 06°26.1'W	LsacX
52	58	Near head of loch, Loch Greshornish, Skye	NG 344 534	57°29.6'N 06°25.9'W	PhiVir; AmenCio.Met
52	59	Below Rubh nan Corr, Loch Greshornish, Skye	NG 345 543	57°30.1'N 06°25.8'W	LsacX
52	60	Central loch over sill, Loch Greshornish, Skye	NG 351 548	57°30.4'N 06°25.3'W	LsacX
52	61	Lyndale Bay, W of Camas Mór, Loch Greshornish, Skye	NG 360 552	57°30.6'N 06°24.5'W	IMS; Lhyp.Ft
52	62	Lyndale Bay, below Tòrr a' Chruidh, Loch Greshornish, Skye	NG 365 555	57°30.7'N 06°24.0'W	IMX; Lsac
52	63	Ard nan Eireachd, Loch Snizort Beag, Skye	NG 373 586	57°32.5'N 06°23.4'W	LhypLsac; Tra
52	64	Mouth of River Hinnisdal, Loch Snizort Beag, Skye	NG 381 575	57°31.9'N 06°22.5'W	IMS; LsacX
52	65	E of Lyndale Point, Loch Snizort Beag, Skye	NG 373 572	57°31.7'N 06°23.3'W	AmenCio; CMS
52	66	W side of lower loch, Loch Snizort Beag, Skye	NG 378 558	57°31.0'N 06°22.6'W	VirOph; Lsac

<b>Sublittoral sites</b>					
<i>Survey</i>	<i>Site</i>	<i>Place</i>	<i>Grid reference</i>	<i>Latitude/longitude</i>	<i>Biotopes recorded</i>
52	67	Centre of loch, Loch Snizort Beag, Skye	NG 386 550	57°30.6'N 06°21.8'W	SpMeg.Fun
52	68	Odhar Sgeir, Loch Snizort	NG 395 536	57°29.9'N 06°20.9'W	CMS; LhypLsac.Pk
52	69	Head, Loch Snizort Beag,	NG 403 529	57°29.5'N 06°20.0'W	SpMeg
52	70	SSE of Kingsburgh, Loch Snizort Beag, Skye	NG 395 544	57°30.3'N 06°20.9'W	
52	71	Beatson Rock, Loch Snizort Beag, Skye	NG 387 552	57°30.7'N 06°21.8'W	AmenCio
52	72	NE side of mid loch, Loch Snizort Beag, Skye	NG 383 561	57°31.1'N 06°22.1'W	LsacX



Figure 17.1. Main features of the area, showing sublittoral sites.

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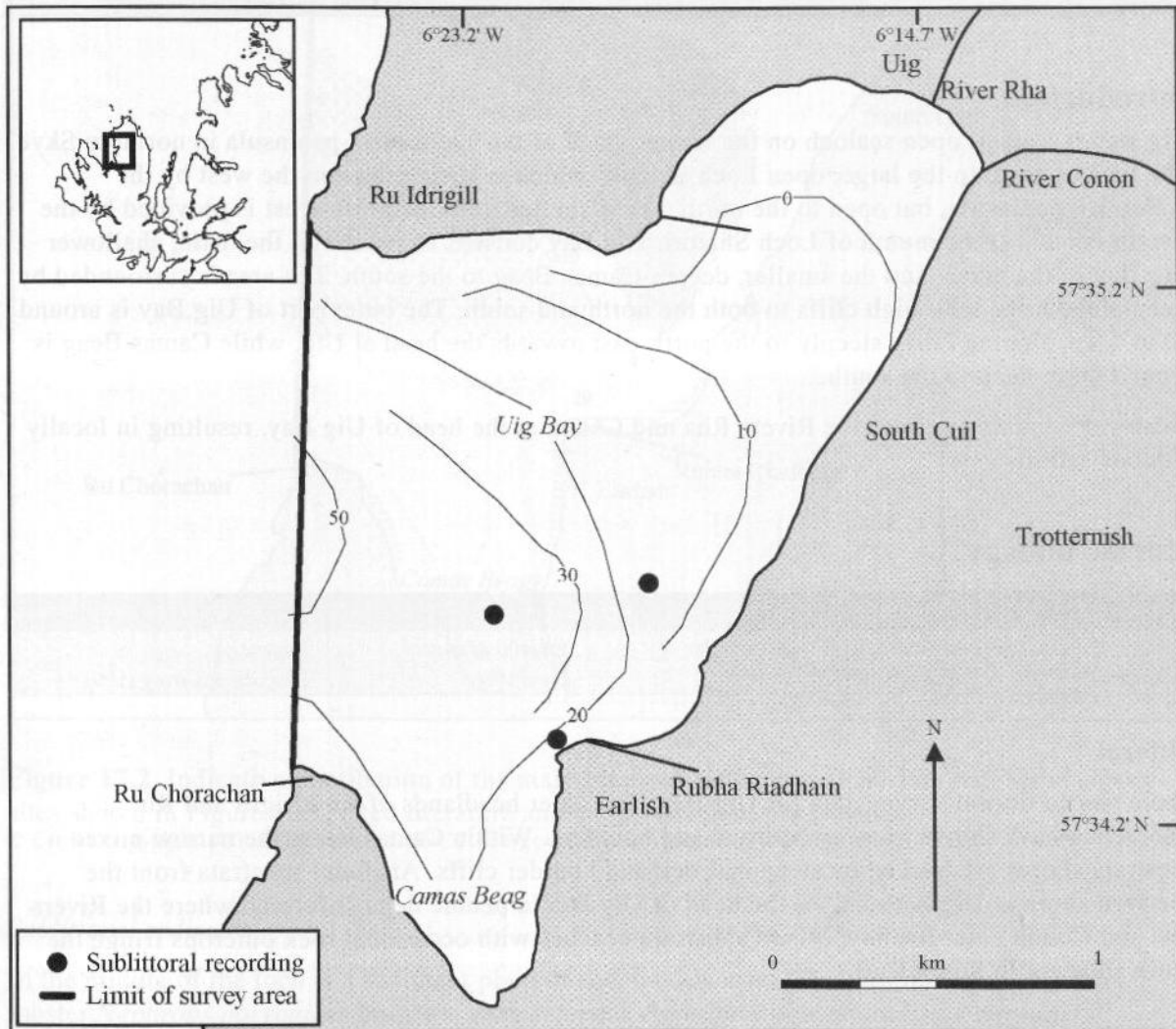


17

## Uig Bay

## Location

Position (centre)	NG 380 628	57°34.8'W 06°22.8'N
Administrative area	Highland	Skye and Lochalsh
Conservation agency/area	Scottish Natural Heritage	North Areas



**Figure 17.1** Main features of the area, showing sites surveyed.

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Physical features	
<i>Physiographic type</i>	Open sealoch
<i>Length of coast</i>	7.1 km
<i>Length of inlet</i>	2.5 km
<i>Area of inlet</i>	3.5 km <sup>2</sup>
<i>Bathymetry</i>	Maximum depth 50 m at mouth, sloping steeply towards head; Camas Beag maximum depth >40 m
<i>Wave exposure</i>	Moderately exposed in outer loch mouth, becoming moderately sheltered towards head
<i>Tidal streams</i>	Very weak throughout loch
<i>Tidal range</i>	4.6 m (mean springs); 1.6 m (mean neaps) (Uig Bay)
<i>Salinity</i>	Fully marine in outer loch, becoming variable towards head

## Introduction

Uig Bay is a small open sealoch on the western side of the Trotternish peninsula in northern Skye. The loch opens into the large, open Loch Snizort, which is sheltered from the west by the Waternish peninsula, but open to the north. Some shelter from the north-west is provided by the Ascrib Islands at the mouth of Loch Snizort. Uig Bay consists of two bays, the main, shallower Uig Bay to the north, and the smaller, deeper Camas Beag to the south. The area is surrounded by steep-sided hills, with high cliffs to both the north and south. The outer part of Uig Bay is around 50 m deep, sloping fairly steeply to the north-east towards the head at Uig, while Camas Beag is around 40 m deep to the south.

Freshwater inputs are from the Rivers Rha and Conon at the head of Uig Bay, resulting in locally reduced salinity.

## Marine biology

Marine biological surveys				
	<i>Survey methods</i>	<i>No. of sites</i>	<i>Date(s) of survey</i>	<i>Source</i>
<i>Sublittoral</i>	Recording (epibiota)	3	June 1988	Hiscock & Covey (1991)

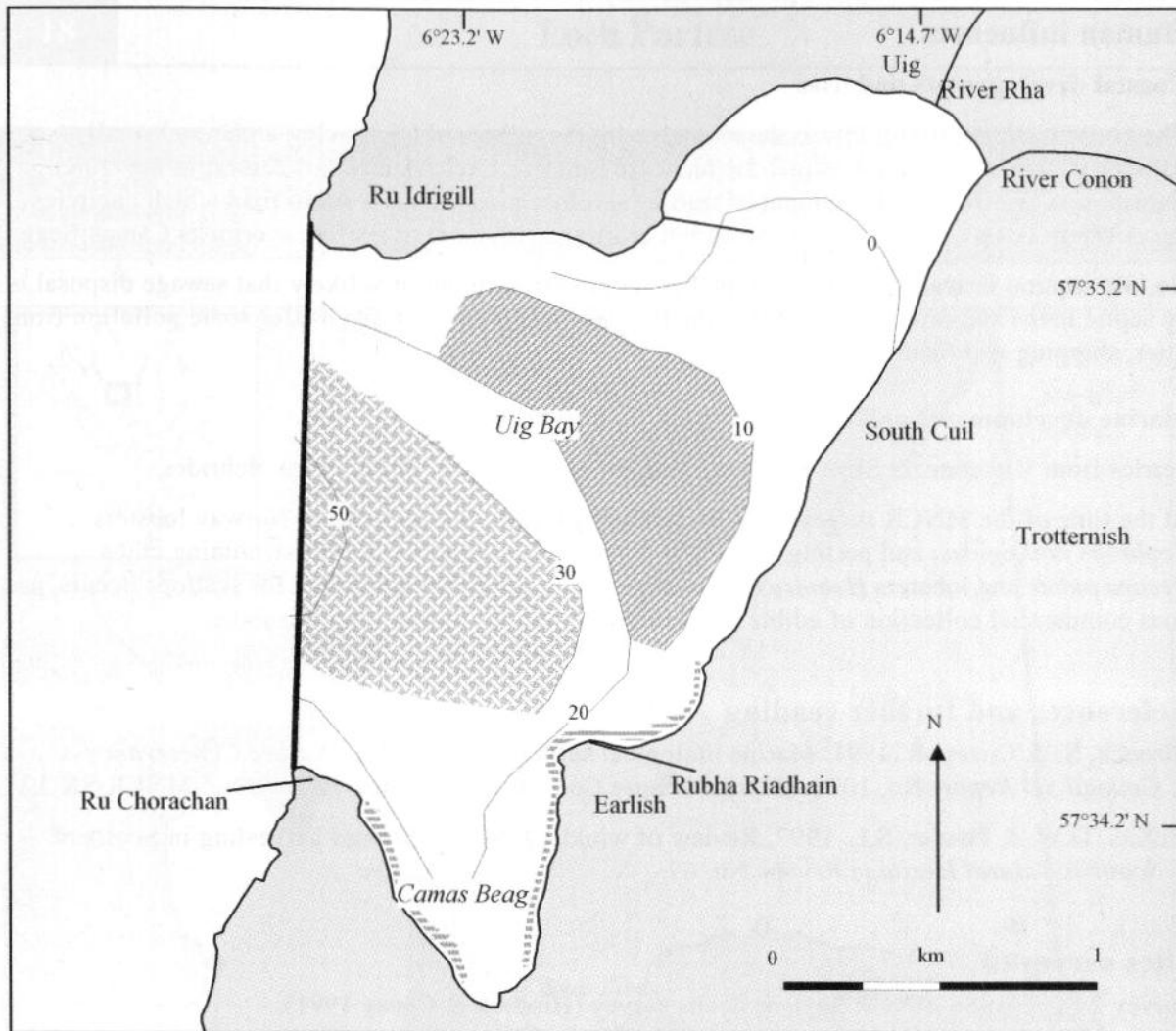
## Littoral

There are no littoral survey data for Uig Bay. The outer headlands of Ru Idrigill and Ru Chorachan have shores of steep bedrock and boulders. Within Camas Beag, the narrow mixed substrata shores are backed by steep bedrock and boulder cliffs. Artificial substrata front the northern shore at Uig harbour. At the head of Uig Bay, a pebble delta is formed where the Rivers Rha and Conon enter the bay. Mixed substrata beaches with occasional rock outcrops fringe the shore adjacent to South Cuil.

## Sublittoral

### *Sublittoral rock*

Little information is available on the sublittoral biotopes within Uig Bay. Steep bedrock and boulder slopes descend down from the shore. Inside the loch these slopes support the kelp *Laminaria saccharina* in the infralittoral (Lsac.Ft). The rock under the kelp is colonised by foliose red algae, covered by silt. With depth, the kelp forest is increasingly dominated by *Laminaria hyperborea*. From 10 m to about 16 m depth the bedrock tends to step, forming ledges and vertical faces. The fauna in crevices includes the ascidian *Ascidia mentula*. Below 15 m, circalittoral bedrock and boulder slopes descend to sediment, and become dominated by brittlestars *Ophiura ophiura*.



**Figure 17.2** Indicative distribution of the main biotopes in the area (based on data from survey sites shown in Figure 17.1, cited literature and additional field observations).

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#### *Sublittoral sediment*

In the middle of the loch is a sediment plain of soft muddy sand. This has numerous Norway lobster *Nephrops norvegicus* burrows, with sea-pens *Pennatula phosphorea* and *Virgularia mirabilis* common. Other associated fauna include the turret shell *Turritella communis* and swimming crabs *Liocarcinus* sp. (SpMeg).

#### Nature conservation

Conservation sites		
Site name	Status	Main features
Conon Woods and Rha Glen	WT	Broadleaved woodland

## Human influences

### Coastal developments and uses

The northern shore of Uig Bay is developed, with the village of Uig having a pier and small harbour which is the main terminal for ferry crossings to Loch Maddy and Tarbert in the Outer Hebrides. A relatively large amount of traffic therefore uses the main A856 road which encircles the northern coast of the loch. The scattered crofting settlement of Earlish overlooks Camas Beag.

No information is available on water quality within the loch, but it is likely that sewage disposal is by septic tanks and direct disposal into the bay, while Uig harbour may suffer some pollution from litter, shipping and fishing waste.

### Marine developments and uses

Ferries from Uig connect Skye with Loch Maddy on North Uist in the Outer Hebrides.

At the time of the MNCR survey in 1988, fishing from Uig was mostly for Norway lobsters *Nephrops norvegicus*, and potting for edible crabs *Cancer pagurus*, velvet swimming crabs *Necora puber* and lobsters *Homarus gammarus*. Some dredging and diving for scallops occurs, as does commercial collection of edible periwinkles *Littorina littorea* from the shore.

## References and further reading

- Hiscock, S. & Covey, R. 1991. Marine biological surveys around Skye. *Nature Conservancy Council SD Report No. 1076*. (Marine Nature Conservation Review Report, No. MNCR/SR/3.)
- McKay, D.W. & Fowler, S.L. 1997. Review of winkle, *Littorina littorea* harvesting in Scotland. *Scottish Natural Heritage Review No. 69*.

## Sites surveyed

Survey 2: 1988 MNCR Skye sealochs survey (Hiscock & Covey 1991).

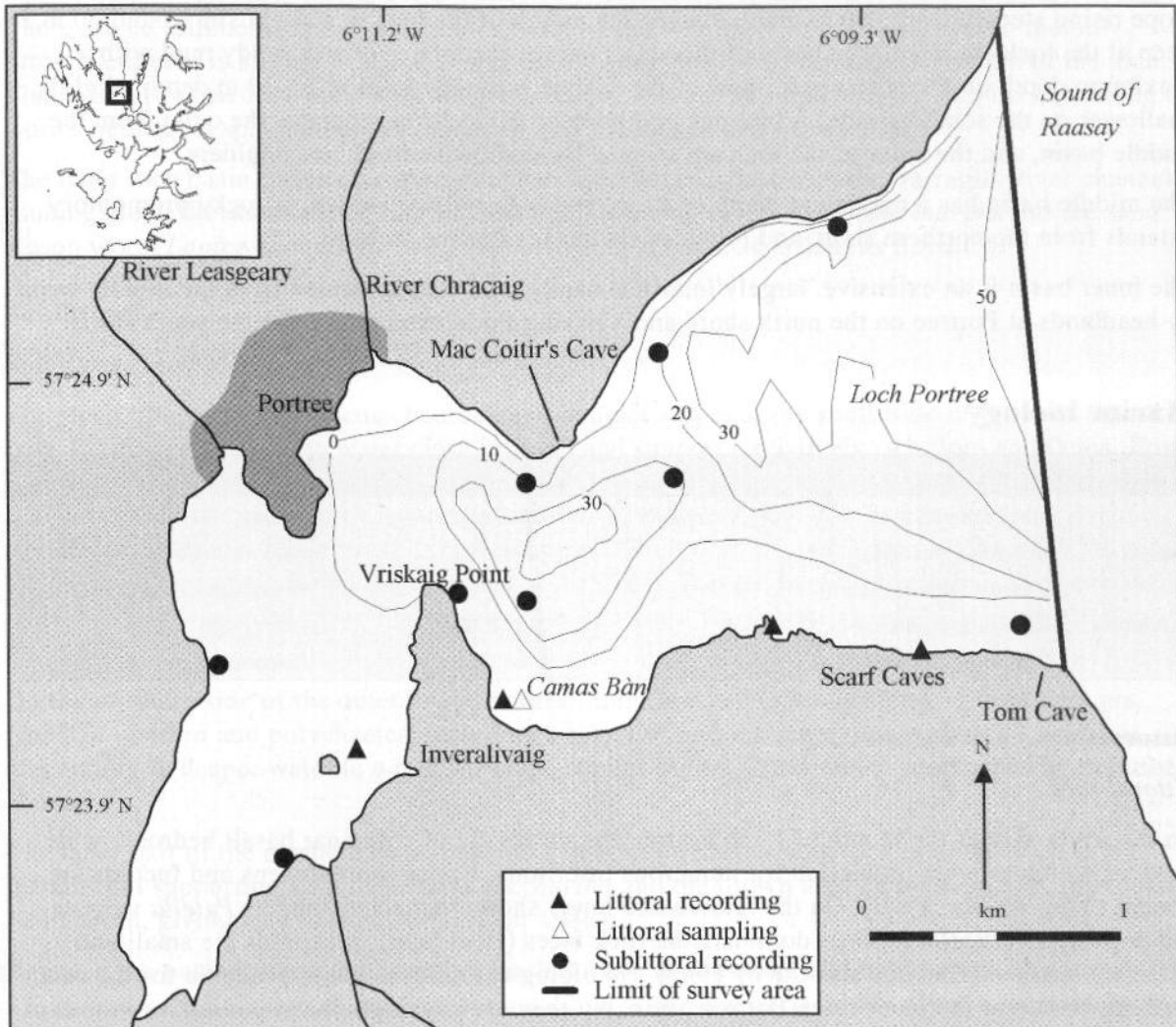
Sublittoral sites					
Survey	Site	Place	Grid reference	Latitude/longitude	Biotopes recorded
2	64	Rubha Riadhain, Uig Bay, Skye	NG 382 619	57°34.2'N 06°22.7'W	Lsac.Pk;
2	65	NE of Ru Chorachan, Uig Bay, Skye	NG 380 623	57°34.4'N 06°22.9'W	SpMeg
2	66	NNE of Rubha Riadhain, Uig Bay, Skye	NG 385 624	57°34.5'N 06°22.4'W	LsacX

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## Loch Portree

## Location

Position (centre)	NG 491 432	57°24.9'W 06°09.6'N
Administrative area	Highland	Skye and Lochalsh
Conservation agency/area	Scottish Natural Heritage	North Areas



**Figure 18.1** Main features of the area, showing sites surveyed.

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## Physical features

Physiographic type	Fjordic sealoch
Length of coast	13.5 km (13.8 km including islands)
Length of inlet	4.8 km
Area of inlet	5.4 km <sup>2</sup>
Bathymetry	Outer loch basin rises from 100 m depth to a 30 m sill, but is predominantly 20–30 m deep; mid-loch basin maximum depth 40 m; inner loch basin intertidal
Wave exposure	Moderately exposed outer loch, to very sheltered inner loch basin
Tidal streams	Very weak to negligible
Tidal range	4.6 m (mean springs); 1.8 m (mean neaps) (Portree)
Salinity	Fully marine in outer loch; variable in mid and inner loch

## Introduction

Loch Portree is a double-silled sealoch on the east coast of Skye, facing north-east into the Sound of Raasay. The loch has three distinct basins, an outer and a middle basin separated by a sill, and an inner, predominantly intertidal basin. Loch Portree is largely surrounded by steep-sided hills and cliffs, particularly in the outer loch where 100 m-high headlands drop steeply to sea level. Freshwater input from the River Varragill at the head of the loch and the smaller Rivers Chraicag and Leasegair into the middle basin at Portree are likely to cause locally reduced salinity.

The outer basin of Loch Portree forms a fairly open east-facing bay. It has a boulder and bedrock slope rising steeply from 100 m depth outside the mouth of the loch to a slight sill around 30 m deep at the loch entrance. The basin of this outer part of the loch is of soft sandy mud with a maximum depth of 43 m; however, most of the seabed is muddy sand at 20–30 m depth, slightly shallower on the southern side. A bedrock and boulder sill at 17 m separates the outer from the middle basin, and the sides of the loch are fringed by shallow bedrock and boulders.

The middle basin has a maximum depth of 41 m, and is fairly steep-sided. A rocky promontory extends from the northern shore and provides shelter for Portree harbour.

The inner basin is an extensive, largely intertidal sandy mud-flat, separated from the middle basin by headlands at Portree on the north shore and Vriskaig Point extending from the south shore.

## Marine biology

### Marine biological surveys

	Survey methods	No. of sites	Date(s) of survey	Source
Littoral	Recording (epibiota)	4	June 1988	Hiscock & Covey (1991)
	Infauunal sampling (core)	1	June 1988	Hiscock & Covey (1991)
Sublittoral	Recording (epibiota)	6	May 1988	Holt (1988)
	Recording (epibiota)	3	June 1988	Hiscock & Covey (1991)

### Littoral

#### Littoral rock

On the south side of the mouth of Loch Portree the shores are of columnar basalt bedrock, with crevices which provide protection for numerous littorinids. Upper shore lichens and fucoids are present (YG; Ver.Ver; PelB). On the middle and lower shore, barnacles, limpets *Patella vulgata* and dogwhelks *Nucella lapillus* dominate the rock faces (BPat.Sem); rockpools are small and relatively shallow (Hiscock and Covey 1991). No biological information is available for the rocky northern shores of the outer Loch Portree basin, but they are physiographically similar to those of the southern shoreline, and are likely to have similar biotopes.

On the south side of the outer loch basin is a series of littoral caves (Scarf Caves and Tom Cave). These are boulder-scoured at their mouths, and contain numerous small crevices and overhangs at a low-shore level. Distinct lichen and encrusting algae (green, red and chrysophyte) zones occur on vertical faces (Chr). Barnacles *Semibalanus balanoides* and sporadic mussels *Mytilus edulis* occur, with patches of foliose red algae. Hydroids, sponges and anemones are present on walls at the base of the caves (Ov). Mac Coitir's Cave on the northern shore has not been surveyed. No biological information is available on the rocky shores of the middle basin of Loch Portree.

The skerry west of Inveralivaig in inner Loch Portree has a steep bedrock and boulder slope, with cobbles and pebbles on the mid-shore. The supralittoral fringe merges with terrestrial vegetation. Abundant black lichens are found on upper littoral rock, with channelled wrack *Pelvetia canaliculata* on a mixed substratum further down the upper shore (Pel). Knotted wrack *Ascophyllum nodosum* dominates the mid-littoral, with an associated fauna of barnacles, winkles and dogwhelks (Asc.Asc). Between this skerry and the eastern shore of the loch is an area of

muddy, anoxic sediment supporting dense patches of the free-living *Ascophyllum nodosum* ecad. *mackaii* (AscX.mac).

The upper shore of the rest of inner Loch Portree is also a steep bedrock and boulder slope dominated by *A. nodosum*, with other algae including *Fucus vesiculosus*, filamentous green algae and sea lettuce *Ulva* sp. (Asc.Asc). Where boulders occur, *S. balanoides* and *M. edulis* are present. A littoral estuarine sediment plain forms the lower shore.

#### *Littoral sediment*

There are no sediment shores in the outer basin of Loch Portree. In the middle basin the only littoral sediment is a small beach at Camas Bàn, facing north-east towards the mouth of the loch. This beach is of medium sand with shell fragments, and has an impoverished infauna consisting of worms *Scolecopsis* sp. and isopods *Idotea* sp. (AP) (Hiscock and Covey 1991).

The inner loch basin forms extensive estuarine muddy sand-flats with the Varragill River channel running along the south-east shore. Infauna comprises lugworms *Arenicola marina* and the sand mason worm *Lanice conchilega*, with the burrowing anemone *Cerianthus lloydii*.

### **Sublittoral**

#### *Sublittoral rock*

The steep limestone and igneous bedrock and boulder slopes at the south side of the loch mouth (site 75) descend into deep water close inshore, and support a relatively rich flora and fauna. From around 17–20 m depth is kelp forest and park, with dense foliose algae, particularly on limestone boulders. On circalittoral rock and boulders from 20 m to at least 27 m depth, ascidians *Ascidia mentula* and *Diazona violacea* and the brachiopod *Terebratulina retusa* are present, with the squat lobster *Munida rugosa* found under boulders (ErSSwi). The relatively rare starfish *Stichastrella rosea* has been recorded from this area, and the cup coral *Caryophyllia smithii* is abundant on boulders.

On the northern side of the outer loch the infralittoral is a gentle sandy slope, with brittlestars *Ophiura ophiura* and polychaetes, including terebellids and the sea mouse *Aphrodita aculeata*, descending in deeper water to a boulder slope similar to that found on the southern side, described above.

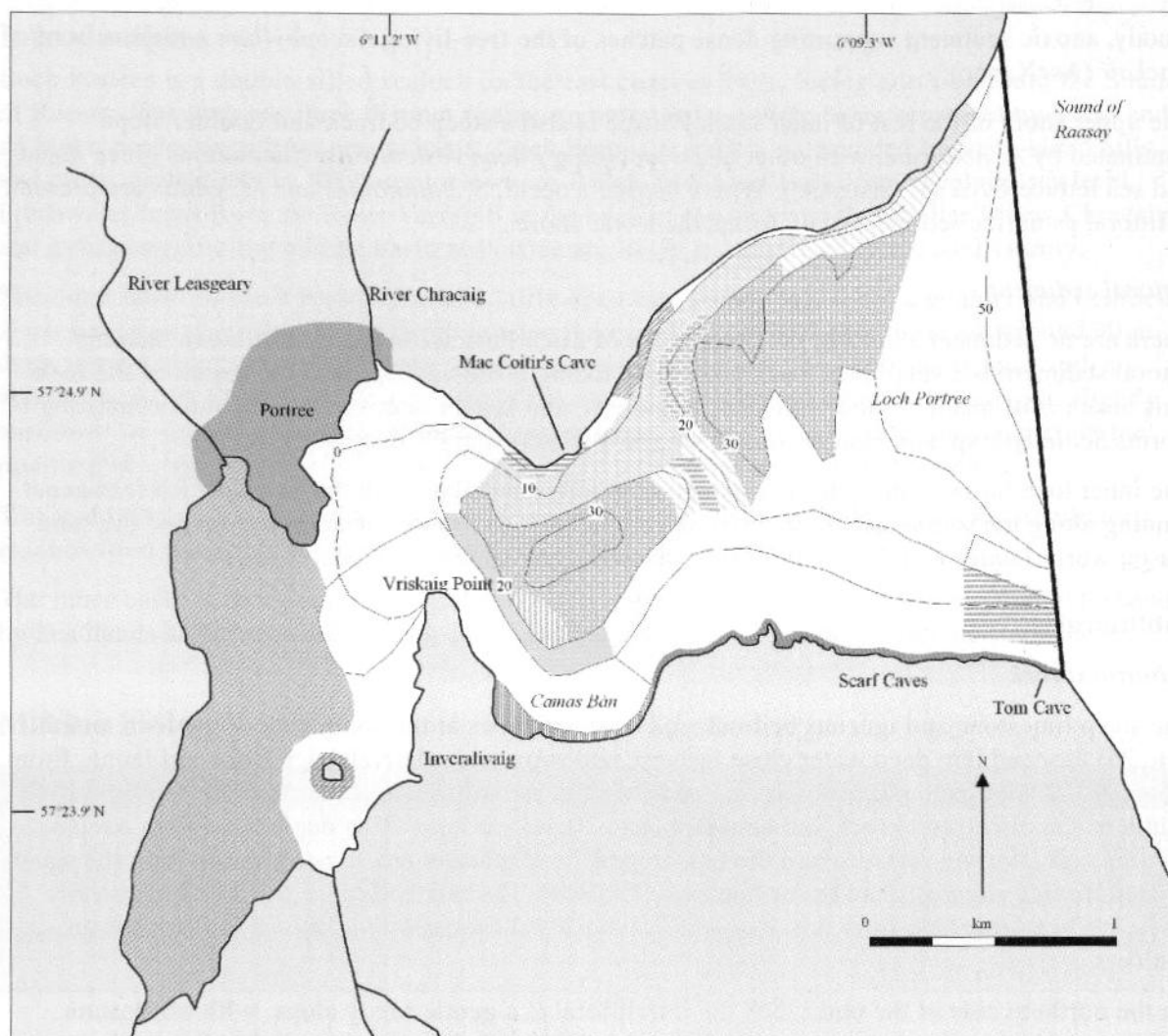
The inner part of the northern outer basin is a little more sheltered, with a boulder slope in the infralittoral supporting kelp *Laminaria saccharina* and the brown alga *Desmarestia* sp. to around 12 m depth, giving way to sandy mud. (Holt 1988).

Between the outer and middle basins of Loch Portree is a bedrock and boulder sill, at around 17–26 m depth. Kelps occur down to around 22 m, with sparse red foliose algae to around 24 m depth. Rock and boulder surfaces are colonised by *C. smithii*, coralline crusts and hydroids. Mobile species included the hermit crab *Anapagurus* sp., the topshell *Gibbula tumida* and *M. rugosa*. (Hiscock and Covey 1991).

In the inner and middle sections of the loch, hard substrata only occur in very shallow water as a wall along the north shore of the middle basin. This supports *L. saccharina*, with brown and filamentous green algae.

#### *Sublittoral sediment*

On the northern side of the mouth of Loch Portree, very steep boulder shores give way in the sublittoral to steep sand and shell fragment slopes with occasional small boulders. Dominant epifaunal species in shallow water include kelp *Laminaria saccharina* and the brown alga *Desmarestia* sp. on boulders and cobbles, with associated fauna of dogfish and sea urchins *Echinus esculentus*. From around 12 m the sediment type is finer, and is almost clay-like from 12–24 m in the deeper parts of the outer basin, with numerous burrowing anemones *Cerianthus*



**Figure 18.2** Indicative distribution of the main biotopes in the area (based on data from survey sites shown in Figure 18.1, cited literature and additional field observations).

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*lloydii* and burrows of the crustaceans *Callianassa* sp. and *Nephrops norvegicus*. Whilst not sampled for infauna, this outer mud-plain area is indicative of a rich muddy sand infaunal community.

Soft sediment occurs in the middle part of the loch in shallow water, descending to a basin at around 40 m. Fauna is sparse in shallow water on the southern side, while on the northern side the sediment fauna is dominated by the sea-pen *Virgularia mirabilis* with the swimming crabs *Liocarcinus depurator* and *Necora puber* and terebellid worms (SpMeg) (Holt, 1988). In deeper water to around 40 m depth, sediment fauna includes *C. lloydii* and numerous megafaunal burrows, probably of *N. norvegicus*. (Holt, 1988). The soft mud in the deep basin supports all three British sea-pen species, *V. mirabilis*, *Pennatula phosphorea* and *Funiculina quadrangularis* (SpMeg.Fun).

### Nature conservation

There are no designated conservation sites in the area at present.



## Human influences

### Coastal developments and uses

Loch Portree is one of the more developed of Skye's sealochs. Portree, the largest town in Skye and indeed in the whole of north-west Scotland, with a population of 1,500 (Barne *et al.* 1997), and its busy harbour are situated on the north-west shore of the loch, and there are small villages on its northern, western and southern shores. The outermost reaches of the loch are uninhabited, with no road access. The main A850 road between Portree and Broadford runs close along the western shore of the inner loch. The hillside above the road is planted with part of Glen Varragill Forest. Tourism is very important to the area.

### Marine developments and uses

At the time of the MNCR survey in 1988, fishing from Portree was mostly for Norway lobsters *Nephrops norvegicus*, and potting for edible crabs *Cancer pagurus*, velvet swimming crabs *Necora puber* and lobsters *Homarus gammarus*. Some dredging and diving for scallops occurs, as does commercial collection of periwinkles *Littorina littorea* from the shore, and the town is a sea angling base. In addition to fishing boats, wildlife cruise vessels and yachts use the harbour. There are licensed salmon *Salmo salar* farm sites outside the loch in the Sound of Raasay.

Most sewage effluent from Portree is discharged to the loch after preliminary treatment; the harbour may suffer some pollution from litter, fishing waste, and oils.

## References and further reading

- Barne, J.H., Robson, C.F., Kaznowska, S.S., Doody, J.P., Davidson, N.C. & Buck, A.L. eds. 1997. *Coasts and seas of the United Kingdom. Regions 15 & 16 North-west Scotland: the Western Isles and west Highland*. Peterborough, Joint Nature Conservation Committee. (Coastal Directories Series.)
- Hiscock, S. & Covey, R. 1991. Marine biological surveys around Skye. *Nature Conservancy Council, CSD Report*, No. 1076. (Marine Nature Conservation Review Report, No. MNCR/SR/3.)
- Holt, R.H.F. 1988. Seasearch: Skye sealochs. (Contractor: Marine Biological Consultants, Ross-on-Wye.) *Nature Conservancy Council, CSD Report*, No. 897. (Seasearch report, No. SS/1/1988.)
- McKay, D.W. & Fowler, S.L. 1997. Review of winkle, *Littorina littorea*, harvesting in Scotland. *Scottish Natural Heritage Review*, No. 69.

## Sites surveyed

- Survey 2: 1988 MNCR Skye sealochs survey (Hiscock & Covey 1991).  
 Survey 52: 1988 Seasearch: Skye sealochs sublittoral survey (Holt 1988).

Littoral sites					
Survey	Site	Place	Grid reference	Latitude/longitude	Biotopes recorded
2	71	W of Inveralivaig, Loch Portree, Skye	NG 486 423	57°24.1'N 06°11.1'W	AscX.mac; YG; Ver.Ver; Asc.Asc; Pel
2	72	Camas Bàn, Loch Portree, Skye	NG 492 425	57°24.2'N 06°10.5'W	AP
2	73	Scorr Skerry, Loch Portree, Skye	NG 503 428	57°24.4'N 06°09.4'W	YG; Ver.Ver; PelB; BPat.Sem
2	74	Scarf Caves, Loch Portree, Skye	NG 509 427	57°24.3'N 06°08.8'W	Chr; SR
52	74	SE side of inner loch, Loch Portree, Skye	NG 483 418	57°23.8'N 06°11.4'W	AscX; LMX

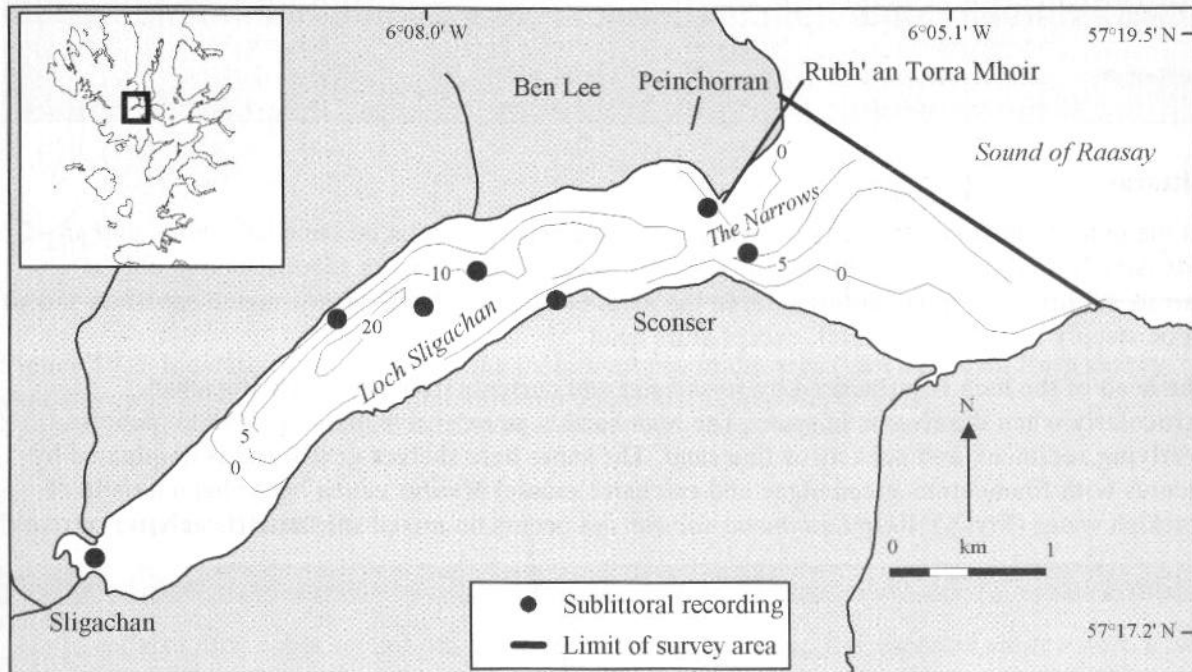
Sublittoral sites					
Survey	Site	Place	Grid reference	Latitude/longitude	Biotopes recorded
2	69	SE of Viewfield Rock, Loch Portree, Skye	NG 499 434	57°24.7'N 06°09.9'W	AmenCio; Lsac.Pk
2	70	Inner loch, Loch Portree,	NG 493 429	57°24.4'N 06°10.4'W	SpMeg; Fun
2	75	Outer loch, Loch Portree,	NG 513 428	57°24.4'N 06°08.4'W	ErSSwi;
52	73	W side of inner loch, Loch Portree, Skye	NG 480 426	57°24.2'N 06°11.7'W	F; IMS
52	75	Point ESE of Portree, Loch Portree, Skye	NG 490 429	57°24.4'N 06°10.7'W	IMS; CMS
52	76	Inside of skerry, Portree harbour, Loch Portree, Skye	NG 493 433	57°24.7'N 06°10.5'W	FaSwV; LsacX
52	77	N side of outer loch, Loch Portree, Skye	NG 505 444	57°25.3'N 06°09.3'W	AmenCio; VirOph
52	78	N side of outer loch, Loch Portree, Skye	NG 498 439	57°25.0'N 06°09.9'W	SpMeg; LsacX

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## Loch Sligachan

## Location

Position (centre)	NG 513 322	57°18.9'N 06°18.9'W
Administrative area	Highland	Skye and Lochalsh
Conservation agency/area	Scottish Natural Heritage	North Areas



**Figure 19.1** Main features of the area, showing sites surveyed.

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## Physical features

Physiographic type	Fjordic sealoch
Length of coast	12.8 km
Length of inlet	5.3 km
Area of inlet	3.8 km <sup>2</sup>
Bathymetry	Sill entrance, with inner basin of 25 m depth
Wave exposure	Sheltered to very sheltered
Tidal streams	Moderate over sill and through the narrows, reducing to weak elsewhere
Tidal range	4.6 m (mean springs); 1.8 m (mean neaps) (Portree)
Salinity	Fully marine in outer loch; reduced in mid and upper loch

## Introduction

Loch Sligachan is a narrow, relatively small fjordic sealoch on the sheltered eastern coast of Skye, opening to the Sound of Raasay. The surrounding landscape is steep-sided hills. The outer mouth of the loch is relatively wide, with a river delta, half of which is exposed at low water, on its southern shore. Towards Sconser, the loch is constricted by the northern shore promontory of Rubh' an Tòrra Mhóir and a shallow sill at 4 m depth, where tidal streams flow more strongly. Half of the sill is exposed at low water, but a deeper navigable channel, 'The Narrows', is used by the local ferry. West of the sill, the seabed descends into the loch basin which has a maximum

depth of 25 m. The head of Loch Sligachan is fed by the Sligachan River, which fluctuates dramatically in flow because the Cuillin Hills form its main catchment. The river has deposited a marshy braided delta some 1 km long and extensive intertidal sediment flats at the loch head. Numerous other streams enter the loch, causing areas of localised lowered salinity.

The shores of Loch Sligachan are little-developed, particularly to the north, where the hill of Ben Lee drops steeply into the loch.

## Marine biology

Marine biological surveys				
	Survey methods	No. of sites	Date(s) of survey	Source
Sublittoral	Recording (epibiota)	4	May 1988	Holt (1988)
	Recording (epibiota)	3	June 1988	Hiscock & Covey (1991)

### Littoral

At the outer loch mouth, there is an extensive mixed substrata delta on the south shore, and an extensive littoral component of the sill and narrows at Rubh' an Tòrra Mhóir, leaving only a narrow sublittoral channel at low tide. In the main body of the loch, narrow mixed substrata shores slope steeply into the sublittoral, except at its head.

The head of the loch is influenced by freshwater and currents from the River Sligachan, particularly when the river is in spate. The loch head is an extensive plain, with small pebbles overlying sediment, and pockets of fine sand. The shore here shelves gently and is dominated by fucoids with filamentous green algae and extensive mussel *Mytilus edulis* beds characteristic of brackish water (MytX). Kelp *Laminaria saccharina* occurs on mixed substrata (LsacX).

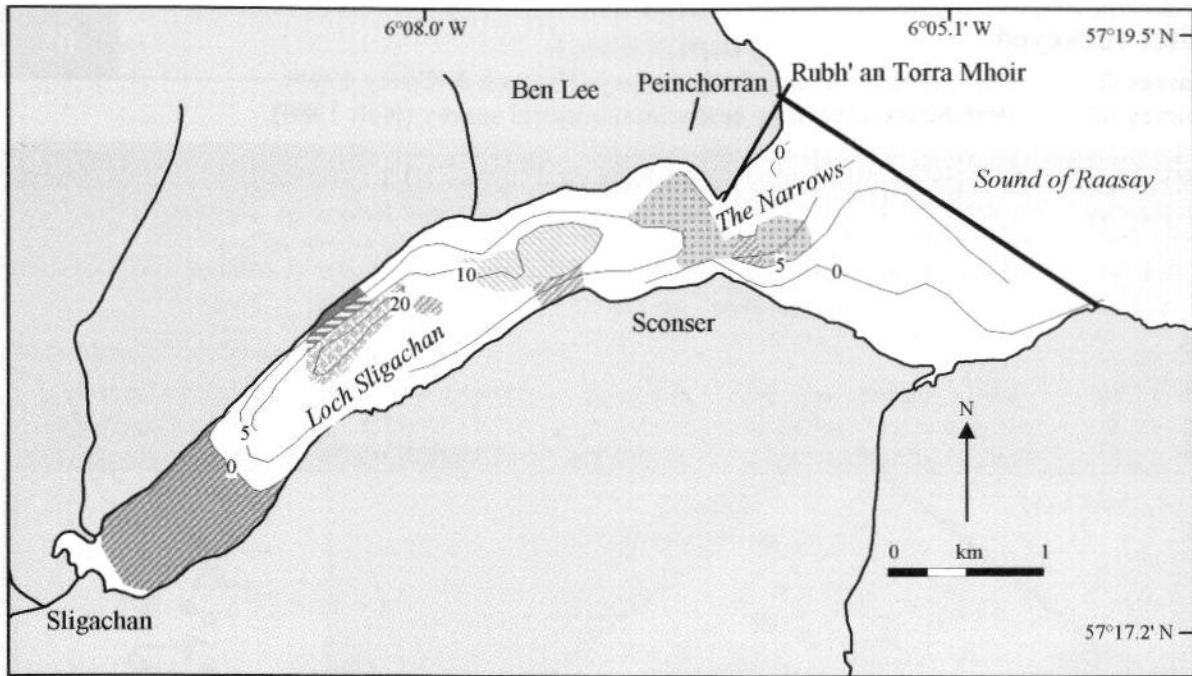
### Sublittoral

The narrows at the entrance to Loch Sligachan support dense red foliose algae with patches of the kelp *Laminaria saccharina* on cobbles, pebbles and shell debris of the horse mussel *Modiolus modiolus* (LsacX). The brown algae *Desmarestia ligulata* and *D. viridis* and the red alga *Bonnemaisonia asparagoides* are abundant in deeper water (9 m depth) in the channel, with frequent scallops *Pecten maximus*. In this area Holt (1988) also found extensive dense *Modiolus* beds (ModHAs), together with the kelps *Laminaria hyperborea* and occasional *L. saccharina*, sea urchins *Echinus esculentus* and topshells *Calliostoma zizyphinum*.

Towards the mid-section of the loch, infralittoral substrata vary, normally a slope of boulders, cobbles and pebbles giving way to a circalittoral plateau at 15 m depth. Kelp *Laminaria digitata* dominates the upper boulder slope, with the ascidian *Asciidiella aspersa* common. With increasing depth, the substratum becomes more muddy, and by 7 m supports beds of the brittlestar *Ophiocomina nigra* and *M. modiolus*.

The seabed levels at 15 m and forms a plateau of fine sediment, where the dominant epifaunal species are *M. modiolus*, gapers *Mya* sp. and the sea-slug *Philine aperta*. The Norway lobster *Nephrops norvegicus* and the echiuran worm *Amalosoma eddystonense* are also present.

Towards the upper loch, the plateau drops to form a steep-sided lower basin with a maximum depth of 25 m. This has a substratum of mud, with many burrows and associated polychaete infauna. *A. eddystonense*, queen scallops *Aequipecten opercularis*, the crab *Liocarcinus depurator* and sea-pen *Virgularia mirabilis* occur on the sediment (VirOph).



**Figure 19.2** Indicative distribution of the main biotopes in the area (based on data from survey sites shown in Figure 19.1, cited literature and additional field observations).

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## Nature conservation

### Conservation sites

Site name	Status	Main features
The Cuillin Hills	NSA	Landscape (part of south-east coast)
Strathaird, Torrin & Sconser	JMT	Mountains, moorland, croftland, coast

### Coastal developments and uses

The A850 road runs close to the southern shore of Loch Sligachan, while on the steep north shore the only road access is the B883 which ends at Peinchorran. Away from the village and hamlets of Sconser, Sligachan and Peinchorran, there are only a few scattered houses. A ferry runs between the small ferry terminal at Sconser and Suisnish on the Island of Raasay. Tourism is important to the area, with hotels in Sligachan and Sconser, and a campsite by the River Sligachan. A golf course is sited adjacent to the southern loch mouth.

### Marine developments and uses

There is a licence for scallop farming in Loch Sligachan, and a large fish farm was operational during the survey by Hiscock & Covey (1991).

### References and further reading

- Hiscock, S. & Covey, R. 1991. Marine biological surveys around Skye. *Nature Conservancy Council, CSD Report*, No. 1076. (Marine Nature Conservation Review Report, No. MNCR/SR/3.)
- Holt, R.H.F. 1988. Seasearch: Skye sealochs. (Contractor: Marine Biological Consultants, Ross-on-Wye.) *Nature Conservancy Council, CSD Report*, No. 897. (Seasearch report, No. SS/1/1988.)

## Sites surveyed

Survey 2: 1988 MNCR Skye sealochs survey (Hiscock & Covey 1991).

Survey 52: 1988 Seasearch: Skye sealochs sublittoral survey (Holt 1988).

Sublittoral sites					
Survey	Site	Place	Grid reference	Latitude/longitude	Biotopes recorded
2	80	Narrows, Loch Sligachan, Skye	NG 531 325	57°18.9'N 06°06.0'W	LsacX
2	81	Mid-loch, Loch Sligachan, Skye	NG 516 324	57°18.8'N 06°07.5'W	VirOph
2	82	Inner loch, Loch Sligachan, Skye	NG 513 322	57°18.7'N 06°07.8'W	LsacX
52	79	Below Sconser, Loch Sligachan, Skye	NG 520 322	57°18.8'N 06°07.1'W	CMX; LsacX
52	80	Entrance, Loch Sligachan, Skye	NG 528 327	57°19.1'N 06°06.2'W	ModHAs; LhypLsac
52	81	NW shore, Loch Sligachan, Skye	NG 508 321	57°18.7'N 06°08.3'W	SpMeg; Ldig; PhiVir
52	82	Head, Loch Sligachan, Skye	NG 494 308	57°17.9'N 06°09.5'W	FX; MytX; LsacX

Compiled by: Jane Richardson & Charlotte Johnston

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## Loch Ainort

## Location

Position (centre)	NG 559 286	57°16.8'N 06°31.2'W
Administrative area	Highland	Skye and Lochalsh
Conservation agency/area	Scottish Natural Heritage	North Areas

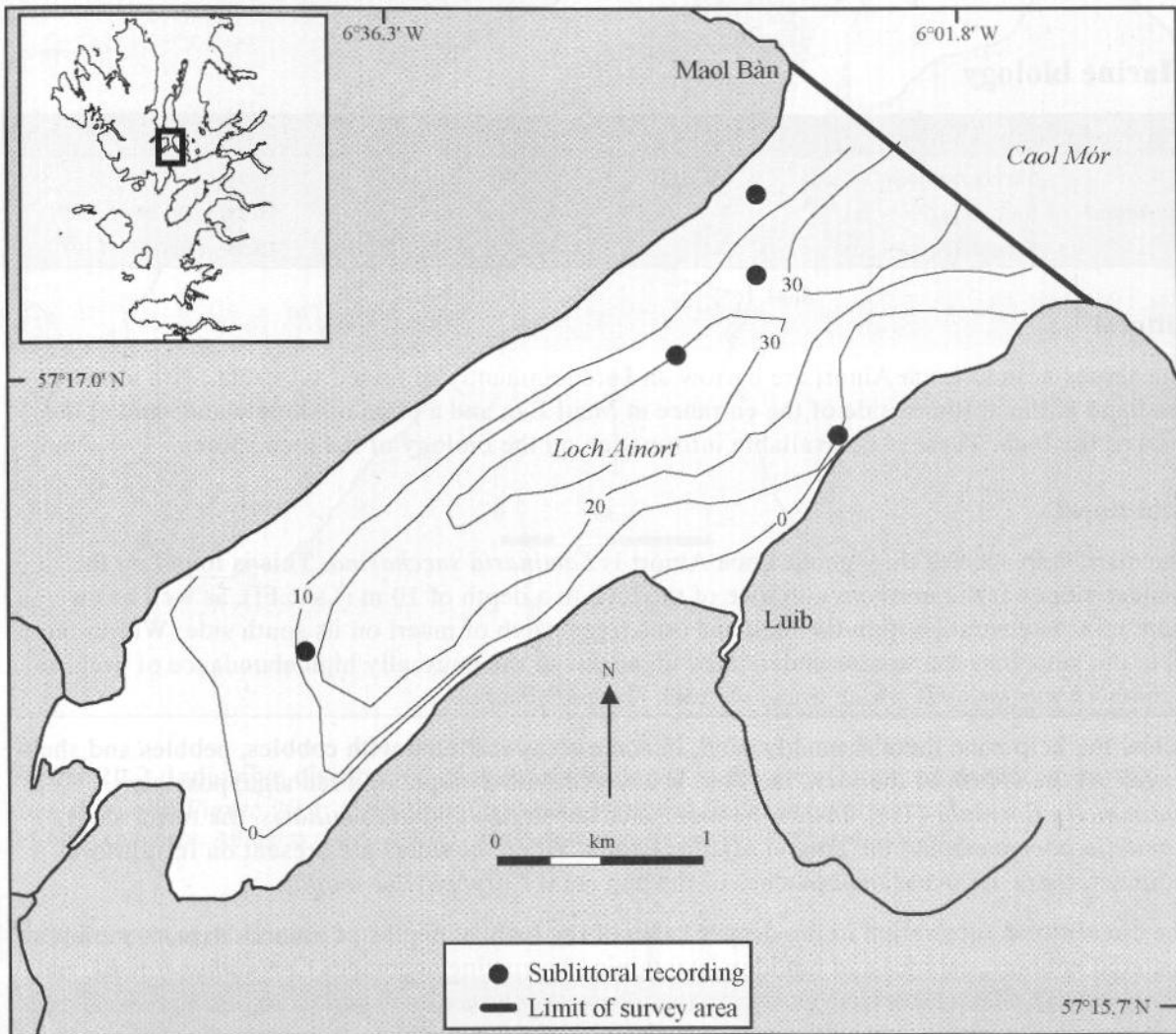


Figure 20.1 Main features of the area, showing sites surveyed.

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## Physical features

Physiographic type	Fjordic sealoch
Length of coast	8.6 km
Length of inlet	5.3 km
Area of inlet	4.0 km <sup>2</sup>
Bathymetry	Maximum depth 40 m; entrance sill 27 m
Wave exposure	Very sheltered throughout most of loch; moderately exposed at entrance
Tidal streams	Very weak at head of loch; moderate at entrance
Tidal range	4.6 m (mean springs); 1.8 m (mean neaps) (Portree)
Salinity	Fully marine; variable at head of loch due to freshwater input

## Introduction

Loch Ainort is situated on the east coast of Skye. It is a small, sheltered sealoch with a relatively simple shoreline and no islands. It has gently sloping sides which descend to a basin in the centre of the loch with a maximum depth of 40 m. At its entrance there is a sill at a depth of 27 m which partially restricts seawater inflow. The loch faces north-east into Caol Mór, the sound between the islands of Scalpay and Raasay, sharing its opening into Caol Mór with Loch na Cairidh, to the east of Loch Ainort, which separates the island of Scalpay from Skye. Two streams, Allt Mhic Mhoirein and Abhainn Ceann Loch Ainort, flow into the head of Loch Ainort, causing salinities in the loch to fluctuate. The loch is situated in a highly scenic area, backed by mountains and glens.

## Marine biology

Marine biological surveys				
	Survey methods	No. of sites	Date(s) of survey	Source
Sublittoral	Recording (epibiota)	3	June 1988	Hiscock & Covey (1991)
	Recording (epibiota)	2	August 1980	Dipper (1981)

### Littoral

The shores around Loch Ainort are narrow and predominantly of mixed substrata, with a rocky headland at the northern side of the entrance at Maol Bàn and a plain of shingle and sand at the head of the loch. There is no available information on the biology of the loch shores.

### Sublittoral

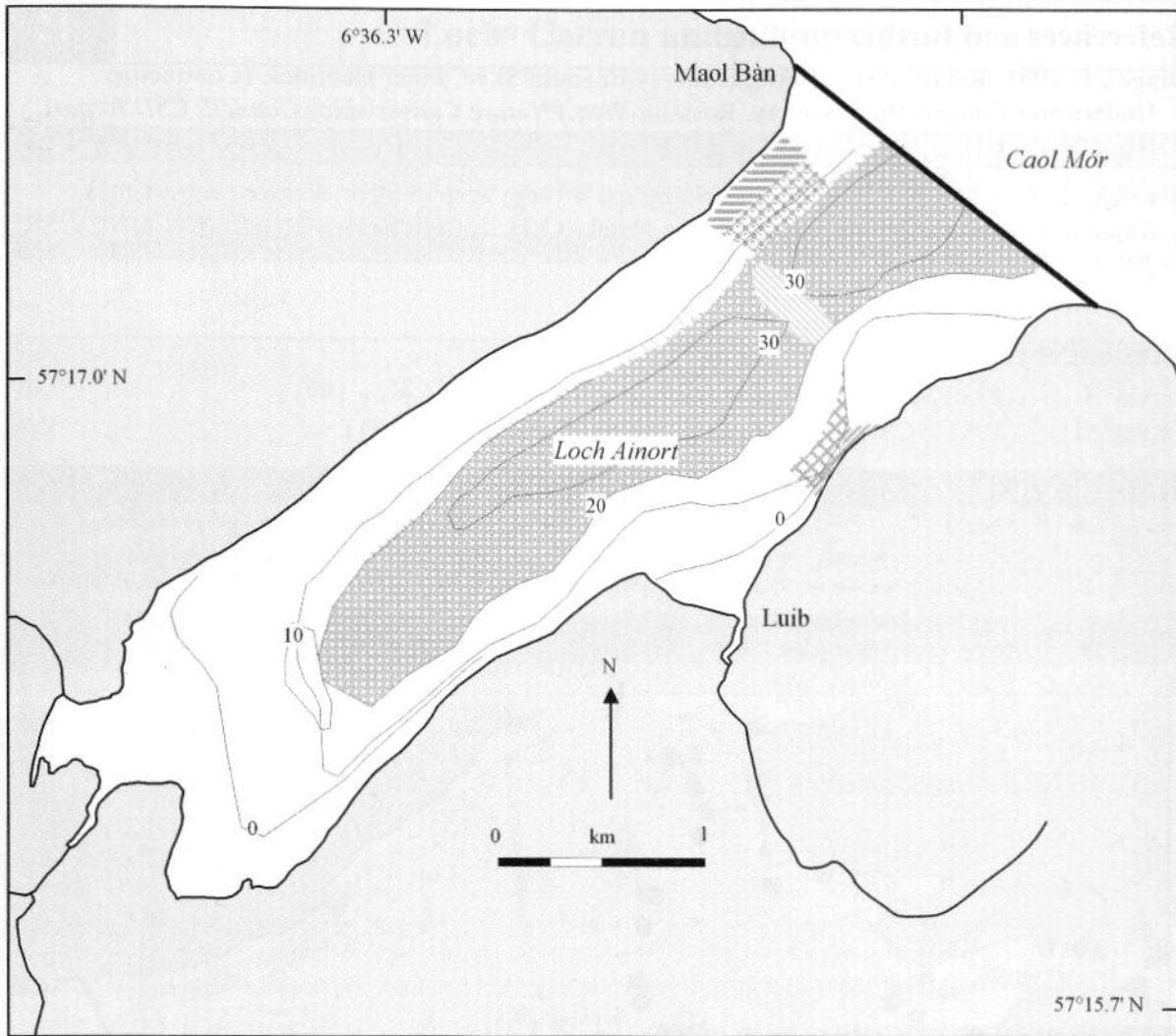
The main kelp species throughout Loch Ainort is *Laminaria saccharina*. This is found on the boulder slopes at the northern entrance of the loch to a depth of 10 m (Lsac.Ft), as well as on more mixed substrata within the loch and on a large patch of maerl on its south side. Within the loch, the kelp zone has sparse understorey algae due to the unusually high abundance of urchins *Psammechinus miliaris* which graze the rock (LsacRS.Psa).

Below the kelp zone there is muddy sand, in some areas scattered with cobbles, pebbles and shell-gravel. At the mouth of the loch, the sand is covered with a carpet of a red alga, possibly *Audouinella floridula* (Tra). Inside the loch, such substrata support *P. miliaris*, the turret shell *Turritella communis* and the mussel *Mytilus edulis*. Where boulders are present on infralittoral sediment, there are occasional patches of the cup coral *Caryophyllia smithii*.

The circalittoral substratum in the deeper basin of the loch, at depths of around 26 m, is mud with scattered cobbles, pebbles and boulders, containing burrowing anemones *Cerianthus lloydii*, and burrowing megafauna, including the Norway lobster *Nephrops norvegicus*. The surface of the mud supports mobile species such as hermit crab *Pagurus* sp. and gastropods, together with the brittlestar *Ophiura albida* and *T. communis*. Boulders within the sediment are heavily silted and colonised by the brachiopod *Neocrania anomala*, hydroids and coralline crusts.

Patches of inshore muddy sand on the southern side of the loch support eelgrass *Zostera marina* (Zmar). The area of maerl on the south side of the loch is colonised by dense *L. saccharina* to a depth of 4 m and, below this, by beds of the brittlestar *Ophiocomina nigra* below this (Lcor). *P. miliaris* is abundant throughout the maerl.





**Figure 20.2** Indicative distribution of the main biotopes in the area (based on data from survey sites shown in Figure 20.1, cited literature and additional field observations).

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## Nature conservation

Conservation sites		
Site name	Status	Main features
The Cuillin Hills	NSA	Landscape (south coast of loch)
Strathaird, Torrin & Sconser	JMT	Mountains, moorland, croftland, coast

## Human influences

### Coastal developments and uses

There is road access all around the edge of Loch Ainort. A small settlement is located at Luib on the south side of the loch, along with a caravan park and campsite.

### Marine developments and uses

There are licensed Atlantic salmon farm sites in Loch Ainort. At the time of the 1988 MNCR survey (Hiscock & Covey 1991), a large fish farm was operational. Various sites within the loch are visited by recreational divers.

## References and further reading

- Dipper, F. 1981. Report of a sublittoral survey of south Skye, Inner Hebrides. (Contractor: Underwater Conservation Society, Ross-on-Wye.) *Nature Conservancy Council, CSD Report*, No. 342.
- Hiscock, S. & Covey, R. 1991. Marine biological surveys around Skye. *Nature Conservancy Council, CSD Report*, No. 1076. (Marine Nature Conservation Review Report, No. MNCR/SR/3.)

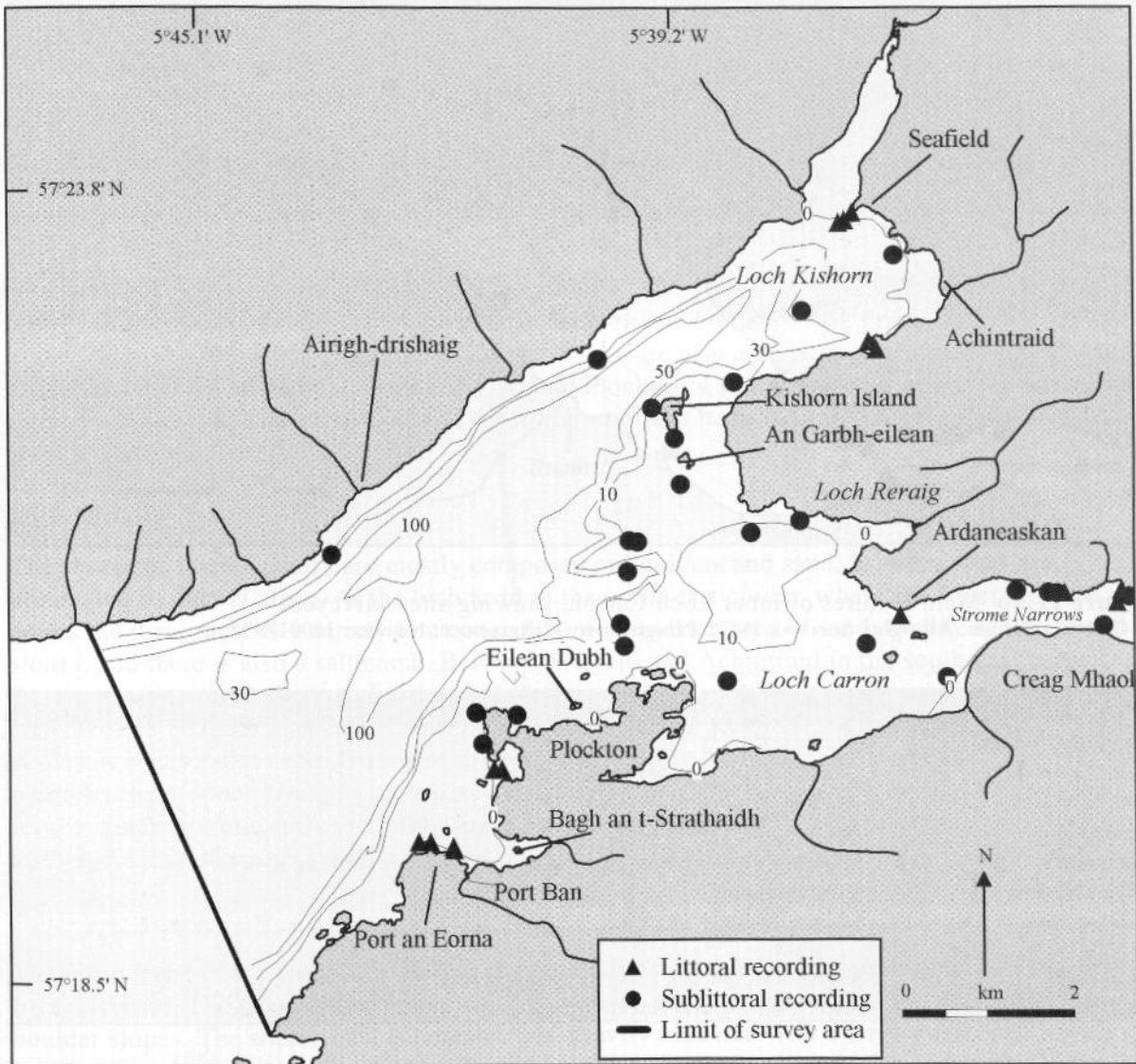
## Sites surveyed

- Survey 2: 1988 MNCR Skye sealochs survey (Hiscock & Covey 1991).  
 Survey 51: 1981 UCS south Skye sublittoral survey (Dipper 1981).

Sublittoral sites					
Survey	Site	Place	Grid reference	Latitude/longitude	Biotopes recorded
2	87	Sill, outer loch, Loch Ainort, Skye	NG 565 292	57°17.3'N 06°02.4'W	VirOph.HAs
2	88	Mid-loch, Loch Ainort, Skye	NG 562 289	57°17.1'N 06°02.7'W	SpMeg; AmenCio.Met
2	89	Inner loch, Loch Ainort, Skye	NG 548 278	57°16.5'N 06°04.0'W	ModHAs; LsacRS.Psa
51	19	S side, Loch Ainort, Skye	NG 568 286	57°17.0'N 06°02.1'W	Zmar; Lcor
51	20	N side, Loch Ainort, Skye	NG 565 295	57°17.4'N 06°02.5'W	SpMeg; Lsac.Ft; Tra

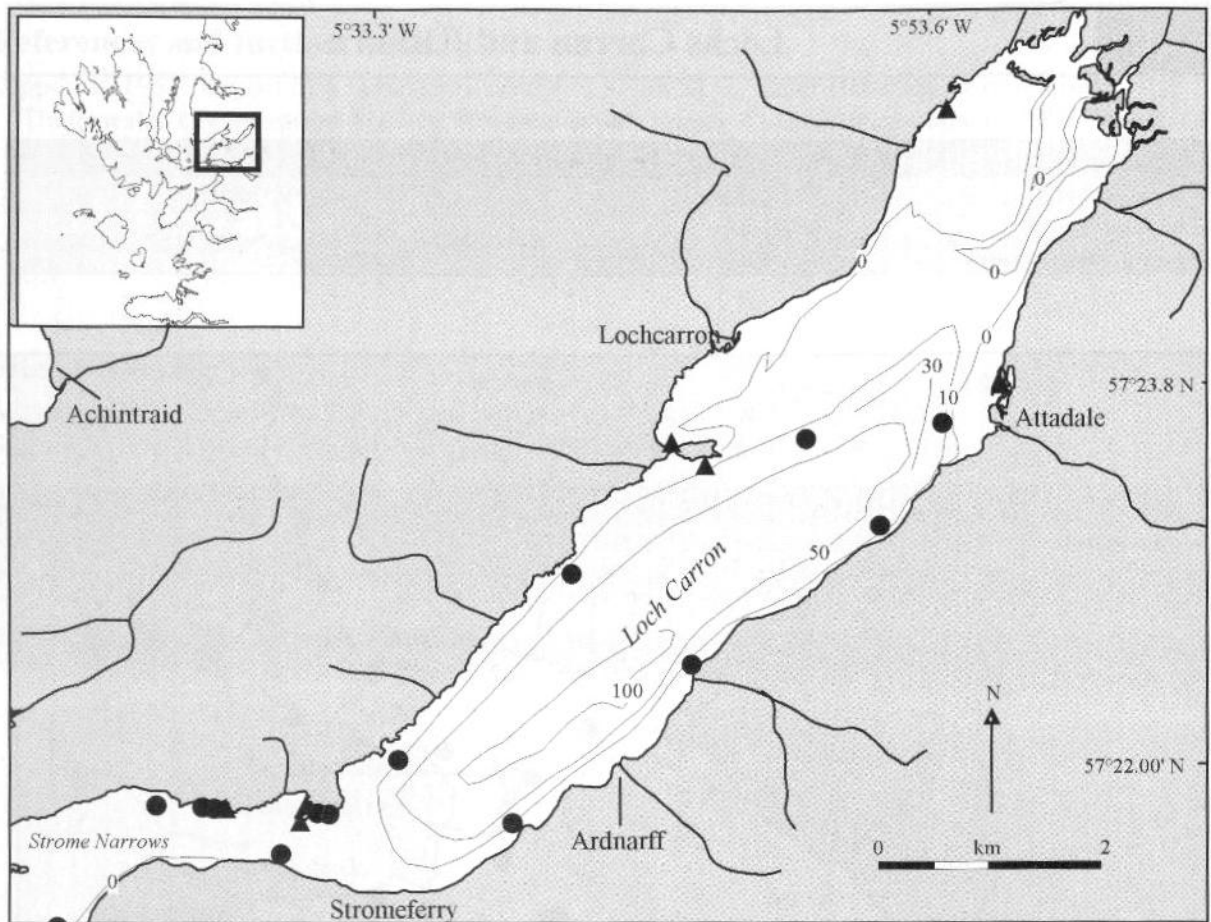
## Location

Position (centre)	NG 820 360	57°21.6'N 05°37.8'W
Administrative area	Highland	
Conservation agency/area	Scottish Natural Heritage	North Areas



**Figure 21.1a** Main features of the area (outer part), showing sites surveyed.

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**Figure 21.1b** Main features of inner Loch Carron, showing sites surveyed.

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**Physical features**

<i>Physiographic type</i>	Fjordic sealoch
<i>Length of coast</i>	100.0 km (114.0 km including islands)
<i>Length of inlet</i>	26.7 km
<i>Area of inlet</i>	26.7 km <sup>2</sup>
<i>Bathymetry</i>	Maximum depths: Carron (outer) 124 m; Carron (inner) 109 m; Kishorn 61 m
<i>Wave exposure</i>	Mostly sheltered
<i>Tidal streams</i>	No data. Probably very weak except moderately strong in Strome Narrows and between islands
<i>Tidal range</i>	4.8 m (mean springs); 1.8 m (mean neaps) (Plockton)
<i>Salinity</i>	Marine, although variable throughout Loch Carron to Strome Narrows

**Introduction**

Lochs Carron and Kishorn form a sealoch complex in Wester Ross opening into the Inner Sound between Skye and the mainland. The wide outer basin of the loch system runs from south-west to north-east and the narrower inner part forms Loch Kishorn. A southerly, parallel and longer arm forms the inner part of Loch Carron. This itself is divided by a series of sills into an inner deep basin, reaching over 100 m depth, a central shallow Strome Narrows section, and an outer wide, relatively shallow section with numerous small islets and drying rocks. The protection afforded by the island of Skye and the configuration of the loch system means that most of Loch Carron is sheltered, with some moderately exposed areas in the outer reaches. Moderately strong tidal streams run through the Strome Narrows. The Rivers Carron and Kishorn enter at the head of their respective lochs and meander over extensive littoral gravel and cobble flats almost 2 km long.

In spite of some modest fish farming, fishing and tourism developments, the lochs remain essentially natural and unspoilt, and the high diversity of habitats, communities and species within the area has resulted in the whole loch system being designated as a Marine Consultation Area. Much of the adjacent terrestrial area is of high scientific interest and conservation value, as evidenced by the number of SSSIs and other conservation areas around the lochs.

## Marine biology

Marine biological surveys				
	Survey methods	No. of sites	Date(s) of survey	Source
Littoral	Recording (epibiota)	12	June 1985	Smith & Hiscock (1985)
	Recording (epibiota)	3	August 1979	Powell <i>et al.</i> (1980)
	Recording (epibiota)	4	February 1974	NCC (1974)
Sublittoral	Recording (epibiota)	33	June 1985	Smith & Hiscock (1985)
	Recording (photography)	1	1970s	Dipper (1981)

### Littoral

Shores throughout the loch system are mainly bedrock and boulders with gravel and cobble flats at the heads of Loch Kishorn and Loch Carron. There are also a number of sediment-filled bays along the complex south coast, especially around Plockton. Littoral biotopes of particular interest in the loch include maerl, horse mussel *Modiolus modiolus* beds and rapids communities in Strome Narrows.

### Loch Kishorn

The shores of Loch Kishorn are mostly composed of boulders and sand. Boulder areas are dominated by furoid algae. At the loch head in the north-east corner, where the River Kishorn enters the loch, there is a narrow arm consisting of a brackish area of sand, muddy sediment and stones, and there is also a saltmarsh. Between Seafield and Achintraid in the south-east corner, there are wide stretches of sand and gravel flats backed by a cobble storm beach. Very sheltered areas around Seafield support beds of the free-living furoid *Ascophyllum nodosum* *ecad. mackaii*. A narrow rocky point at Seafield is of interest because it is composed of Cambrian limestone bored by the piddock *Hiatella arctica* and encrusted with a thick layer of coralline algae at lower levels. Otherwise this and other rocky areas are mainly blanketed by zoned furoid algae, typical of sheltered rocky shores.

### Outer and middle Loch Carron

The north coast of the outer loch is only accessible by boat and there is no information available for the shores. The coast is fairly linear and the shores are likely to consist of short bedrock and boulder slopes. The south coast is complex and heavily indented with a large number of bays and headlands and a variety of shore types from bedrock and boulders to pebbles and sand. On the western coast of the Plockton peninsula there are a number of substantial bays which are of particular interest for their extent and variety of sediment habitats. Of special interest are areas of live maerl and maerl-gravel which support a wide variety of burrowing bivalves. These beds often extend out from the shore to nearby small islands such as Eilean Sgreabach off Port-an-Eorna. Sediment shores in the bays support typical communities of lugworms *Arenicola marina* in the muddier areas, and the bivalves *Angulus tenuis* in the cleaner sands and *Ensis arcuatus* at low water and beyond. In muddy gravel there are beds of mussels *Mytilus edulis* and cockles *Cerastoderma edule*. Where streams run into bays, such as at Port Ban near Bagh an t-Srathaidh, the brackish-water furoid *Fucus ceranoides* is common and if there is sufficient shelter, beds of *Ascophyllum nodosum* *ecad. mackaii*. Rocky shores in this area have a typical mixture of

barnacles, limpets and furoid algae, as found on semi-sheltered shores elsewhere in north-west Scotland (LR.MLR and LR.LLR.).

Shores in the central shallow section of Loch Carron are mostly rocky and there are many small rocky islets. Sediment occurs in the bay at Plockton and in Loch Reraig. The latter is a bay about 1 km long and half as wide, enclosed by steeply sloping hills, lying between Loch Kishorn and the inner part of Loch Carron. It has an upper boulder shore, muddy in sheltered parts, giving way to sandy flats with *C. edule*, *A. marina* and the sand mason worm *Lanice conchilega*. To the south of the bay, the kilometre or so of shoreline around Ardaneaskan consists of mixed sediments and boulders with sand and gravel on the lower shore. It is of interest for the large bed of horse mussels *Modiolus modiolus* on the lower shore and extending into the sublittoral, and the presence of maerl.

Steep bedrock shores and cliffs occur on the north side of Strome Narrows. Barnacles predominate on the upper shore, with zones of fucoids down the rest of the shore. These shores are tide-swept.

#### *Upper Loch Carron*

At the head of Loch Carron there is an extensive cobble and gravel flat nearly 2 km long and extending across the loch. Barnacles *Semibalanus balanoides*, mussels *Mytilus edulis* and periwinkles *Littorina* spp. predominate. Similar areas of gravelly sediment extend along the sides of the loch to Lochcarron village on the north side and Attadale on the south side. At Attadale, there are glacial outwash deposits of gravel and cobbles, formed into ridges running parallel to the shore. Behind the ridges are a series of shallow, linear pools, some with dense algal growths. Rocky shores in the upper loch have not been investigated. There are *Ascophyllum nodosum* ecad. *mackaii* beds at mid-Strome.

#### **Sublittoral**

The diversity of habitats and species in the sublittoral of this sealoch complex is particularly high for sheltered sealochs in this north-west sector. Substrata range from bedrock and boulders to pebbles, gravel and soft sediments, exposed to a wide range of depth and water movement. However, diversity of species is reduced at many sites, particularly on bedrock and boulders, by the grazing activities of the sea urchins *Echinus esculentus* and *Psammechinus miliaris*.

#### *Loch Kishorn*

The north coast of Loch Kishorn and outer Loch Carron is linear. The seabed along this coast descends fairly steeply as slopes of boulders with sediment. The general pattern is for the rocks to become progressively smaller and more scattered with depth, with sediment predominating below 20–30 m depth. The sediment is sandy in the shallows and becomes muddier with increasing depth. The sediment also becomes muddier moving from west to east, with clean gravel at sites along the outer parts of Loch Carron, such as at Airigh-drishraig, and a prevalence of muddy sand in Loch Kishorn. *Laminaria saccharina* kelp forest covers the rocks in shallow water, and sediment areas are heavily worked by crabs and polychaetes. Norway lobster *Nephrops norvegicus* burrows are common in deeper areas. Similar slopes occur on the west side of Kishorn Island and An Garbh-eilean, but here boulders are preceded by bedrock with *L. saccharina* forest in shallow water. At the head of Loch Kishorn there is a flat plain of muddy gravel and coarse sand sloping very gradually down from the intertidal sediment flats. The sediment is hummocked by very large *Arenicola marina* mounds and crab excavations. The opisthobranch mollusc *Philine aperta* is very common, as it is in similar situations in other sealochs.

#### *Outer and middle Loch Carron*

The open parts of the south coast of the outer loch are moderately exposed to wave action and shallow sublittoral sandy sediments predominate. An extensive *Phymatolithon calcareum* maerl bed is present in the shallows north of Plockton. at a depth of 8 m. Maerl is also present along the coast to the west of Plockton around a small island outside the bay Camas Dubh-aird. In this area, maerl extends up to extreme low water. The maerl has a wide variety of molluscs living amongst it

(Nunn 1993) and a number of epiphytic algae attached to it. It is likely that maerl beds are quite common along the whole stretch of coastline from Plockton to Kyle of Lochalsh on the coast to the south of Loch Carron. The sandy areas west of Plockton also support beds of eelgrass *Zostera marina* in shallower water (Zmar). *Zostera* is present at around 1 m depth inshore of A' Ghlas-leac and, like maerl, may be common along this coast in suitably sheltered areas. Fan mussels *Atrina fragilis* are reported from two places in central Loch Carron.

In sheltered areas such as west of Eilean Dubh, the shallow sediments are muddier, with gravel and stones, and support the usual complement of scattered kelp *Laminaria saccharina*, *Chorda filum* and flocculent brown algae (Lsac.X). Slightly deeper, between around 5–10 m depth, loose-lying mats of red algae *Trilliella* and *Phyllophora crispa* are common (Tra).

There are extensive shallow areas between the numerous islets in the middle section of Loch Carron where the seabed consists predominantly of shell-gravel and pebbles. This whole area is particularly diverse and interesting and includes patches of maerl at the western end around rocky islets such as Sgeir Bhuidhe, *Z. marina*, rich algal communities and beds of horse mussels *Modiolus modiolus*. Where water is funnelled into narrow channels, such as between Eilean na Beinne and the mainland, and between Kishorn Island and An Garbh-eilean, tidal streams generally flow and there are well-developed algal communities in the shallows. *L. saccharina* is often dense with occasional very large *Saccorhiza polyschides*. The pebbles and gravel support a wide variety of foliose and encrusting algae with as many as 40 different species present. Similar areas without tidal streams support many fewer species.

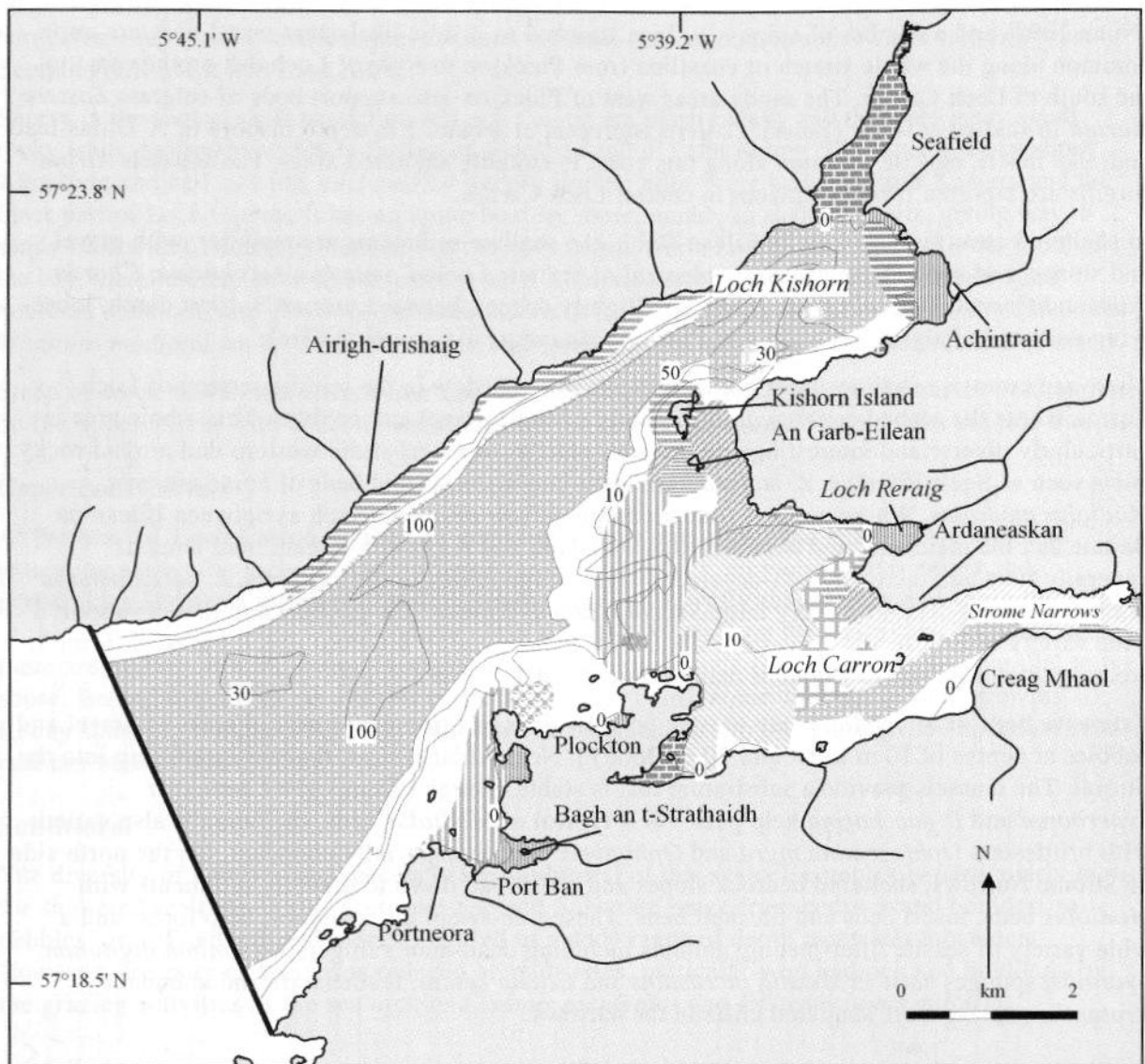
Extensive beds of *M. modiolus* are present on both sides of Strome Narrows in areas of gravel and pebbles at depths of 10 m to around 20 m (ModT). Near Ardaneaskan, the bed extends up into the littoral. The mussels provide a substratum that is stable enough to support a *Laminaria hyperborea* and *L. saccharina* kelp park. As is typical of *Modiolus* beds, the fauna is also varied, with brittlestars *Ophiocomina nigra* and *Ophiothrix fragilis* especially abundant. On the north side of Strome Narrows, sheltered bedrock slopes and cliffs lead down to gravelly sediments with *Modiolus* beds, maerl beds and fileshell beds. These tide-swept cliffs support kelp forest and a wide variety of sessile filter-feeding animals including dead-man's fingers *Alcyonium digitatum*, hydroids, sponges such as *Myxilla incrustans* and *Cliona celata*, featherstars and abundant *Protanthea* sp. on more sheltered cliffs in the narrows.

#### Upper Loch Carron

The narrow inner arm of Loch Carron to the east of Strome Narrows has a fairly linear coastline. The sides fall away steeply as slopes of boulders and sediment, the sediment slope continuing to below 40 m depth. The boulders are dominated by *Laminaria saccharina* kelp forest to around 10 m depth, and rock surfaces tend to be heavily grazed. There is little bedrock in this part of the loch but steep silted bedrock cliffs are present off small headlands on the south side, west of Ardnarff. The bedrock extends to at least 15 m depth, with kelp at the top of the slope. However, the predominant rock cover, especially in the circalittoral, is ascidians such as *Ciona intestinalis* and the anemone *Protanthea simplex*. The latter is also present on boulder slopes throughout the inner loch, and 'fields' of anemones have been described from around Sgeir Chreagach, a group of rocks in the middle of the loch.

Towards the head of Loch Carron, there is an extensive shallow sublittoral area of gravel and sand extending down from the littoral gravel flats. At Attadale there is a level outwash fan of gravel and sand resulting from the inflow of the Attadale River. The lugworm *Arenicola marina* is common here. Sand is also present as a shallow level plain east of Strome Narrows and supports typical algal species including *L. saccharina*, *Chorda filum* and some *Laminaria hyperborea*, the latter presumably able to tolerate the sheltered conditions because there is some residual tidal flow from the narrows.

The deep central basin of the inner loch has not been investigated but is likely to consist of soft muds with the usual variety of burrowing megafauna including sea-pens and Norway lobsters *Nephrops norvegicus*.

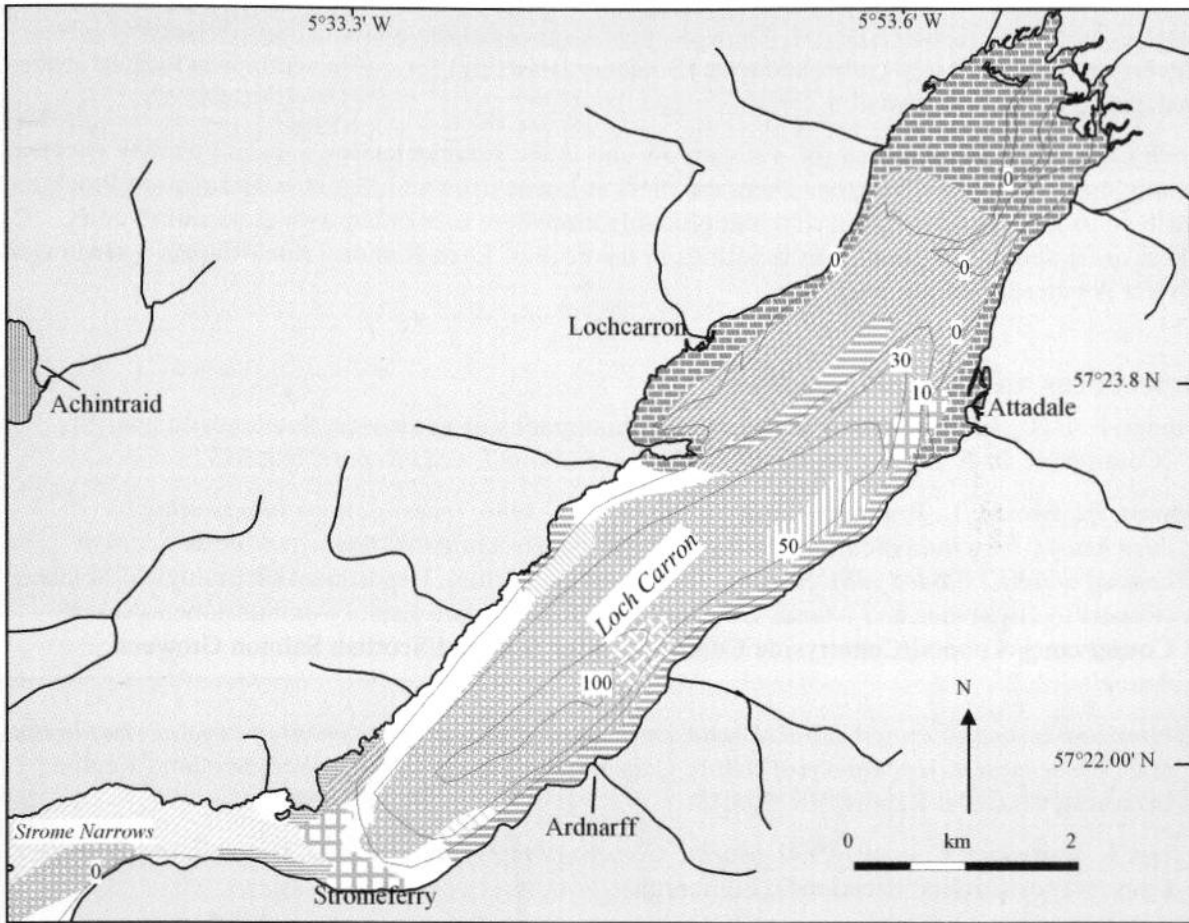


**Figure 21.2a** Indicative distribution of the main biotopes in the area (outer part) (based on data from survey sites shown in Figure 21.1a, cited literature and additional field observations).  
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## Nature conservation

Conservation sites		
Site name	Status	Main features
Loch Carron	MCA	Marine biological
Allt nan Carnan	NNR; SSSI	Botanical
Slumbay Island	SSSI	Geological
Attadale	SSSI; GCR	Geological
Carn a' Bhealaich Mhoir	SSSI; GCR	Geological
Slumbay Point	GCR	Geological
Eilean na Creige Duibhe	SWT	Small island with heronry
Wester Ross	NSA	Landscape (part of north shore)
Strome Castle & Castle Bay	RSA	Landscape
Strome Castle	NTS	Historical
Balmacara estate & Kyle/Plockton peninsula	NTS	Coastal estate and islands (Plockton – Kyle of Lochalsh)





**Figure 21.2b** Indicative distribution of the main biotopes in inner Loch Carron (based on data from survey sites shown in Figure 21.1b, cited literature and additional field observations).  
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## Human influences

### Coastal developments and uses

Loch Carron is well served by road and rail. The railway between Kyle of Lochalsh and Dingwall runs through Plockton and along the whole of the south coast of Loch Carron. Most of the shoreline around Lochs Carron and Kishorn can be reached by road with the exception of parts of the peninsula between the two lochs and most of the north coast. The small town of Plockton lies on the south side of outer Loch Carron and has a small airfield. Stromeferry lies on the south coast to the east of Strome Narrows, Achintee and Strathcarron at the head of the loch and Lochcarron on the west side near the head. Achintraid in Loch Kishorn and other small villages are dotted around the loch system. The north coast is remote and mountainous, whilst large areas around the rest of the coast support conifer plantations.

There is a yard on the north-west side of Loch Kishorn where oil-rig platforms were constructed, but it closed in 1987. South-west of the village of Lochcarron are the ruins of Strome Castle, managed by the National Trust for Scotland.

### Marine developments and uses

Several companies have licensed salmon *Salmo salar* farms within the loch system, including three salmon hatcheries associated with the rivers. There are licensed sites for mussel, scallop and oyster farms in Loch Kishorn and for scallop farming in Loch Carron. Admiralty Chart 2209 (1992) shows 25 mariculture sites throughout the loch system, with the greatest number in upper

Loch Carron and in Loch Kishorn. There is some inshore fishing and creeling for Norway lobster *Nephrops norvegicus* and crabs, and a small fishery (trawling) for queen scallops is located at the east end of Strome Narrows.

Loch Carron is a popular area for water sports and in the summer season is used by many yachts, mostly operating from Plockton. There are piers at Lochcarron and Plockton and slips at Plockton, north and south Strome, Achintraid and probably elsewhere associated with mariculture units. There are a number of permanent moorings at the head of Loch Kishorn. Loch Carron's sewerage system is currently being upgraded.

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## Sites surveyed

- Survey 53: 1985 Smith Loch Torridon and Loch Carron survey (Smith & Hiscock 1985).
- Survey 63: 1970s Ridley north-west Scotland sublittoral photographic survey (Dipper 1981).
- Survey 86: 1978 Smith Wester Ross littoral survey (Smith 1978).
- Survey 265: 1970–80 SMBA/MBA Great Britain intertidal survey (Powell *et al.* 1980).

Littoral sites					
Survey	Site	Place	Grid reference	Latitude/longitude	Biotopes recorded
53	7	Strome Castle Bay, Loch Carron	NG 862 355	57°21.6'N 05°33.3'W	F
53	8	Stromeferry, Loch Carron	NG 862 353	57°21.5'N 05°33.3'W	F; K
53	9	Port a' Mheirlich, Loch Carron	NG 855 353	57°21.5'N 05°34.0'W	F
53	10	Ardaneaskan, Loch Carron	NG 834 351	57°21.3'N 05°36.0'W	F; VsenMtru; Lan
53	11	Port-an-Eorna, west, Loch Carron	NG 775 322	57°19.6'N 05°41.7'W	MLR
53	12	Port-an-Eorna, east, Loch Carron	NG 778 322	57°19.6'N 05°41.4'W	SLR
53	13	Seafield, Loch Kishorn	NG 827 399	57°23.9'N 05°37.0'W	SLR

**Littoral sites**

<i>Survey</i>	<i>Site</i>	<i>Place</i>	<i>Grid reference</i>	<i>Latitude/longitude</i>	<i>Biotopes recorded</i>
53	14	Achintraid, Loch Kishorn	NG 831 382	57°23.0'N 05°36.5'W	SLR
53	17	Slumbay, rocks, Loch Carron	NG 895 385	57°23.3'N 05°30.1'W	SLR
53	18	Slumbay, harbour, Loch Carron	NG 895 386	57°23.4'N 05°30.1'W	LMX
53	19	Head of loch, Loch Carron	NG 918 415	57°25.0'N 05°28.0'W	FX
53	20	Attadale Station, Loch Carron	NG 923 391	57°23.7'N 05°27.4'W	Rkp
86	14	Seafield Point, Loch Kishorn, Wester Ross	NG 828 400	57°23.9'N 05°36.9'W	LGS SLR
86	15	Achintraid, Loch Kishorn, Wester Ross	NG 831 385	57°23.1'N 05°36.5'W	SLR
86	16	Camas Dubh-aird, Loch Carron, Wester Ross	NG 784 332	57°20.1'N 05°40.9'W	Zmar Phy
86	17	Bagh an t-Srathaidh, Loch Carron, Wester Ross	NG 779 322	57°19.5'N 05°41.3'W	FX
265	60	Camas Dubh-aird, Plockton, Loch Carron	NG 785 332	57°20.1'N 05°40.8'W	Lan
265	100	Port an Eeorna, Loch Carron	NG 776 323	57°19.6'N 05°41.6'W	Rkp SLR
265	111	Seafield, Loch Kishorn	NG 829 401	57°23.9'N 05°36.8'W	SLR

**Sublittoral sites**

<i>Survey</i>	<i>Site</i>	<i>Place</i>	<i>Grid reference</i>	<i>Latitude/longitude</i>	<i>Biotopes recorded</i>
53	6/1	W of Kishorn Island, Loch Kishorn	NG 804 376	57°22.6'N 05°39.2'W	Lsac
53	6/2	W of An Garbh-eilean, Loch Kishorn	NG 807 367	57°22.1'N 05°38.8'W	IMX; Lsac
53	6/3	Near Ardarroch, Loch Kishorn	NG 834 395	57°23.7'N 05°36.3'W	PhiVir
53	7/2	SW of Airigh-drishaig, Loch Carron	NG 763 358	57°21.5'N 05°43.1'W	XKScrR
53	7/3	First headland past Howard Doris slip, Loch Carron	NG 797 382	57°22.9'N 05°39.9'W	SpMeg; CR
53	7/4	Between Kishorn Island and An Garbh-eilean, Loch Kishorn	NG 806 373	57°22.4'N 05°38.9'W	LhypGz;
53	7/5	Near Sgeir Bhuidhe, Loch Carron	NG 801 360	57°21.7'N 05°39.4'W	SS; IR
53	7/6	NW of Meall na h-Airde, Loch Kishorn	NG 814 380	57°22.8'N 05°38.2'W	BrAs; Lsac
53	7/7	SW of Meall na h-Airde, Loch Carron	NG 816 361	57°21.8'N 05°37.9'W	SS
53	9/1	E of Rubha Mór, Loch Carron	NG 813 342	57°20.8'N 05°38.1'W	VirOph
53	9/2	W of Eilean a'Chait, Loch Carron	NG 800 347	57°21.0'N 05°39.4'W	Phy
53	9/3	Near Eilean Dubh, Loch Carron	NG 786 338	57°20.5'N 05°40.6'W	IMU;Tra
53	9/4	NW of An Dubh-aird, Loch Carron	NG 781 339	57°20.5'N 05°41.2'W	Phy
53	9/5	Loch Reraig, Loch Carron	NG 822 362	57°21.9'N 05°37.3'W	BrAs; Lsac
53	9/6	E of Eilean na Beinne, Loch Carron	NG 802 360	57°21.7'N 05°39.3'W	LsacX
53	9/7	SW of Sgeir Bhuidhe, Loch Carron	NG 800 356	57°21.5'N 05°39.4'W	IR; Phy
53	9/8	NE of A'Ghlas-leac, Loch Carron	NG 782 335	57°20.3'N 05°41.1'W	Zmar; Phy
53	10/1	Opposite Castle Bay, Loch Carron	NG 863 353	57°21.5'N 05°33.2'W	Ale; ModT
53	10/2	Strome Narrows, Loch Carron	NG 854 353	57°21.5'N 05°34.1'W	ModT
53	10/3	Near mid-Strome, Loch Carron	NG 870 358	57°21.7'N 05°32.5'W	LsacX
53	10/4	Near Strome Carronach, Loch Carron	NG 859 359	57°21.8'N 05°33.6'W	K
53	10/5	Eilean an-t-Sratha, Loch Carron	NG 830 347	57°21.1'N 05°36.4'W	LhypGz; EphR
53	10/6	Near Leacanashie, Loch Carron	NG 830 354	57°21.5'N 05°36.4'W	ModT
53	10/7	Strome Narrows, near Leacanashie, Loch Carron	NG 853 353	57°21.5'N 05°34.2'W	ModT
53	10/8	N of mouth of Allt Cadh an Eas, Loch Carron	NG 840 343	57°20.9'N 05°35.4'W	
53	12/1	NE of Ardnarff, Loch Carron	NG 895 366	57°22.3'N 05°30.0'W	SpMeg

<b>Sublittoral sites</b>					
<i>Survey</i>	<i>Site</i>	<i>Place</i>	<i>Grid reference</i>	<i>Latitude/longitude</i>	<i>Biotopes recorded</i>
53	12/2	Near avalanche shelter, Loch Carron	NG 912 378	57°23.0'N 05°28.4'W	SpMeg.Fun; BrAs
53	12/3	Near Sgeir Chreagach, Loch Carron	NG 905 386	57°23.4'N 05°29.1'W	NeoPro
53	12/4	Opposite Castle Bay, Loch Carron	NG 859 349	57°21.3'N 05°33.5'W	LsacX
53	12/5	SW of Ardnarff, Loch Carron	NG 880 352	57°21.5'N 05°31.5'W	K; NeoPro
53	12/6	S of Strome Castle, Loch Carron	NG 864 353	57°21.5'N 05°33.1'W	IR
53	12/7	Near mouth of River Attadale, Loch Carron	NG 918 387	57°23.5'N 05°27.9'W	IGS
53	13/4	Loch Kishorn, Loch Carron	NG 822 388	57°23.3'N 05°37.4'W	AmenCio.Met
63	10	Loch Carron	NG 800 350	57°21.1'N 05°39.4'W	SedK

## Lochs Torriron and Shieldaig

## Location

Position (centre)	NG 800 560	57°32.5'N 05°34.5'W
Administrative area	Highland	
Conservation agency/area	Scottish Natural Heritage	North Areas

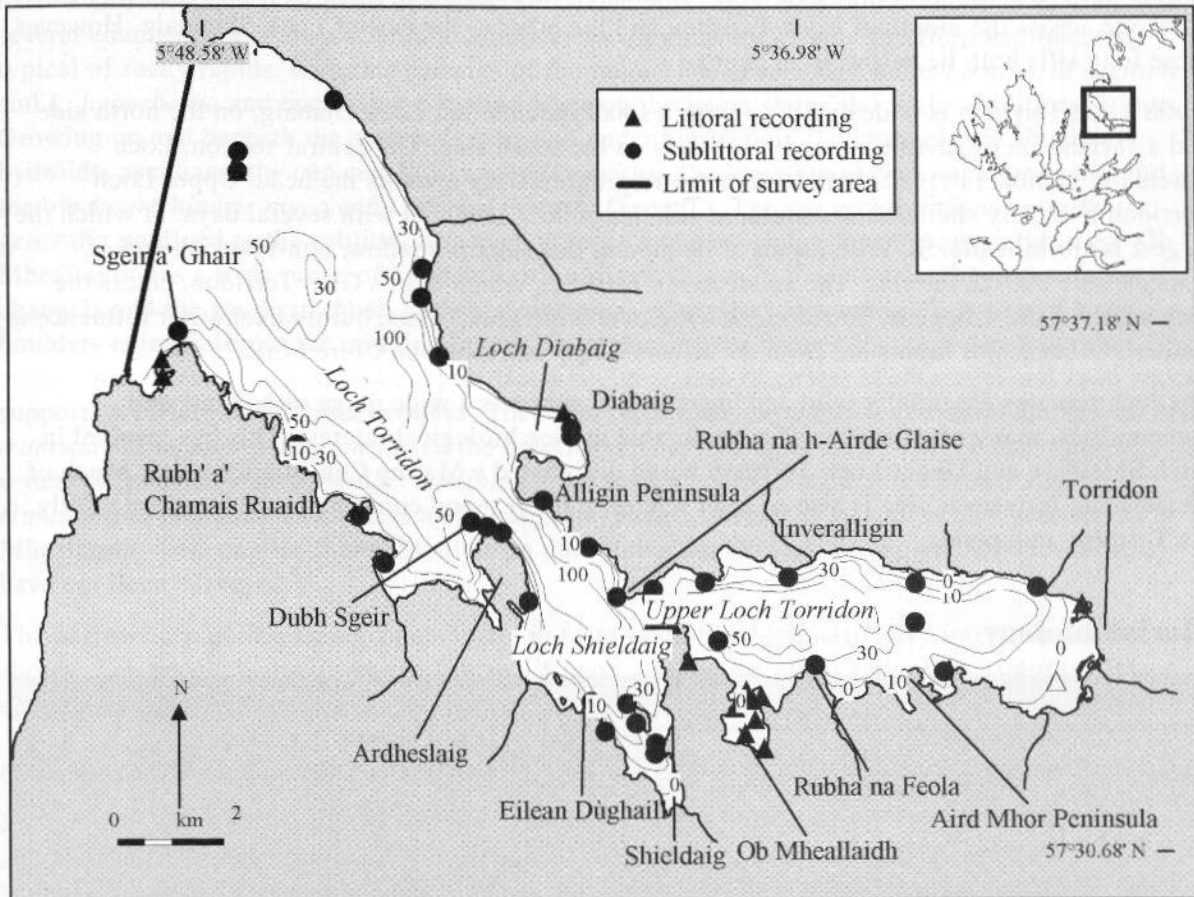


Figure 22.1 Main features of the area, showing sites surveyed.

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## Physical features

Physiographic type	Fjordic sealoch
Length of coast	98.9 km (104.2 km including islands)
Length of inlet	21.7 km
Area of inlet	75.1 km <sup>2</sup> (74.9 km <sup>2</sup> excluding islands)
Bathymetry	Maximum basin depths: outer 145 m; middle 135 m; inner 88 m
Wave exposure	Exposed to extremely sheltered
Tidal streams	Weak through most of loch; moderately strong through upper narrows and entrance to Ob Mheallaidh
Tidal range	4.9 m (mean springs); 2 m (mean neaps) (Shieldaig)
Salinity	Marine; brackish surface waters in Upper Loch Torriron

## Introduction

Loch Torridon forms the north-east coast of the wild and rugged Applecross peninsula in Wester Ross, with its mouth opening onto the Inner Sound between Skye and the mainland at the northern end. The wide outer part of the loch runs north-west to south-east and so the loch mouth receives little shelter from the Isle of Skye, and has a relatively long fetch across the Minch to the Isle of Lewis. Where the loch narrows about one-third of the way along its length by the Ardheslaig peninsula, it continues in a south-easterly direction as Loch Shieldaig. Upper Loch Torridon runs west-east and is separated from Loch Shieldaig by the Shieldaig peninsula, where the loch narrows to around 300 m. These upper narrows have a sill running across them at between 10 m and 20 m depth. Moderately strong tidal streams run through these narrows. There are two further sills, one across the mouth of Loch Torridon and the other to the east of Loch Shieldaig. However, these long sills both lie below 50 m depth.

Outer Loch Torridon is wide and deep with a small indentation, Loch Diabaig, on the north side and a succession of small bays and headlands on the south side. The central section, Loch Shieldaig, is moderately sheltered and narrows progressively towards the head. Upper Loch Torridon is mostly sheltered, its southern side irregularly indented with several bays, of which the largest is Ob Mheallaidh. With rapids at its mouth, this inlet is shallow, non-brackish and of considerable marine interest. The small River Torridon, which drains Glen Torridon, enters the loch south of the village of Torridon, flowing over wide gravel flats, but its freshwater influence is limited. Other major inputs are from the Rivers Balgy and Abhainn Coire Mhic.

The loch remains essentially wild and unspoilt and supports a wide range of habitats and communities, many of which are of considerable marine biological interest. This has resulted in Loch Shieldaig and Upper Loch Torridon being designated a Marine Consultation Area. Much of the adjacent terrestrial area is also of high scientific interest and conservation value, particularly the Torridon mountains.

## Marine biology

Marine biological surveys				
	Survey methods	No. of sites	Date(s) of survey	Source
<i>Littoral</i>	Recording (epibiota)	10	June 1985	Smith & Hiscock (1985)
	Recording (epibiota)	3	August 1978	Smith (1978)
	Recording (epibiota)	4	August 1979	Powell <i>et al.</i> (1980)
	Infaunal sampling (digging & sieving)	1	May 1979	Powell <i>et al.</i> (1980)
<i>Sublittoral</i>	Recording (epibiota)	34	June 1985	Smith & Hiscock (1985)
	Recording (photography)	1	1970s	Dipper (1981)

### Littoral

The majority of shores throughout Loch Torridon are steep and rocky, with sediment restricted to small bays and a more extensive area of muddy gravel at the heads of the lochs.

#### *Upper Loch Torridon*

The shores of the upper loch are very sheltered from wave action and are sheltered from the prevailing south-westerly winds by the high mountains of Ben Damph and Ben Shieldaig. Much of the shoreline is composed of stones and cobbles with a very reduced flora and fauna. At the head of the loch there are extensive gravel flats where the River Torridon enters, and also on the north shore below Torridon House, where a substantial stream, Abhainn Coire Mhic Nòbuil, flows down from the mountains. The gravel flats form part of a predominantly sediment area extending for around 2 km across the head of the loch. Here there are also extensive muddy sand-flats both at Torridon and further south. The flats are covered by lugworm *Arenicola marina* casts but

otherwise seem to have a rather restricted fauna, including the ragworm *Nephtys hombergii* and possibly the bivalve *Mya arenaria*; many empty shells of the latter are present. These flats are of interest because sand is uncommon in north-western sealochs, in the majority of which stones and boulders form the main habitat at the loch head. Further interest is added by the presence of dense beds of the free-living fucoid *Ascophyllum nodosum* ecad. *mackaii* on upper shore boulders and cobbles. This is typically found in extremely sheltered conditions with low salinity influence.

On the south side of Upper Loch Torridon there is a shallow sheltered lagoonal inlet, Ob Mheallaidh. The inlet is almost circular in shape, about 1 km<sup>2</sup> in area and has a sand and gravel floor. Its name means 'the Bay of Disappointment', but it has considerable marine interest. The narrow entrance area is of particular interest because it forms a tidal rapids about 75 m long, with several channels and a drop of around 2 m over an irregular rocky sill. The flora and fauna are typical of rocky rapids, with rich growths of the fucoid *Fucus serratus*, kelps *Laminaria digitata* and *L. hyperborea* and encrusting coralline algae on the lower shore and in the sublittoral fringe. Growing on and beneath the seaweed cover and under boulders in the channels are abundant hydroids, ascidians, the cup coral *Caryophyllia smithii*, the brachiopod *Neocrania anomala* and the bivalves *Chlamys nivea* and *Chlamys distorta* (Fserr.T). The sea urchin *Echinus esculentus*, generally confined to the sublittoral, occurs in large numbers on the lower shore in this area. Ob Mheallaidh has a wide range of habitats, with bedrock shores in the entrance, boulders in the channels and the southern shore, and extensive areas of shell-gravel and sand. A line of large boulders extends across the middle of the inlet, separating the deeper southern part from the northern shallows. Just inside the rapids lies a large expanse of coarse shell-gravel and sand which supports a variety of different bivalves. The razor clam *Ensis arcuatus* is common, along with *Mya truncata*, *Venerupis senegalensis* and the holothurian *Leptosynapta inhaerens*. In the shallow water, the horse mussel *Modiolus modiolus* provides anchorage for the large brown algae *Himantalia elongata*, *F. serratus* and *L. digitata*. Eelgrass *Zostera marina* is also present in Ob Mheallaidh. Two smaller sheltered inlets on the south side, Ob Gorm Beag and Ob Gorm Mór, have not been surveyed.

The narrows separating Upper Loch Torridon from Loch Shieldaig also have interesting tide-swept shores. The small channel between Eilean a'Chaoil and the mainland shore has a floor of deep shell-sand and boulders with a high biomass and diversity of species.

#### *Outer Loch Torridon and Loch Shieldaig*

Loch Shieldaig is sheltered, with shores of boulders or bedrock mostly dominated by barnacles and fucoids. The majority of shores throughout outer Loch Torridon are steep and rocky with bedrock predominating and with some steep cliffs between Diabaig and Inveralligin on the north side. In Loch Diabaig, the north shore consists of stones and boulders. Bedrock outcrops are found on small headlands between bays on the southern side of the outer loch and lining both sides of the narrows separating Upper Loch Torridon from Loch Shieldaig. The bedrock shows a fairly typical zonation, with barnacles *Semibalanus balanoides* and the fucoids *Fucus vesiculosus* or *Ascophyllum nodosum* covering most of the mid-shore, the prevalence of one over the other depending on the aspect and slope of the shore. On steep or vertical rock on some of the headlands, there are very distinct bands of the black lichen *Verrucaria maura* and channelled wrack *Pelvetia canaliculata*. There is a small exposed skerry in the middle of the mouth of Loch Torridon (Sgeir na Trian) – also the northernmost recorded site in Britain for the encrusting green seaweed *Codium adhaerens* (see Area summary 4) (Smith & Hiscock 1985), where the tops of the rocks are covered by a thick mat of the green alga *Prasiola* sp. and there are typical exposed coralline rockpools.

#### **Sublittoral**

Loch Torridon has not been surveyed by the MNCR and the data available for the sublittoral have been collected by enthusiastic amateurs led by marine biologists. These surveys were restricted to the edges of the loch and did not include any dredging in the deep central areas of each basin. In

the 1960s and 1970s, the Department of Agriculture and Fisheries for Scotland Marine Laboratory (now Fisheries Research Services) undertook considerable work in the loch on Norway lobster *Nephrops norvegicus*, the crab *Goneplax rhomboides* and the goby *Lesueurigobius friesii*, all of which live in deep soft mud and were common in Upper Loch Torridon off the Aird Mhor peninsula at depths of around 30 m (Chapman & Rice 1971; Rice & Chapman 1971; Rice & Johnstone 1971). A population of the leopard-spotted goby *Thorogobius ephippiatus* was also recorded (Miller *et al.* 1973). The deep sediments in Loch Torridon are therefore likely to be similar to those found in other north-west sealochs. Species characteristic of such sediments, including *N. norvegicus* and the sea-pens *Virgularia mirabilis* and *Pennatula phosphorea*, have been recorded from sites throughout the loch system. Very dense beds of *Funiculina* sp. occur in Loch Diabaig, along with *Asteronyx loveni* at only 32 m depth.

#### Upper Loch Torridon

Sublittoral substrata in Upper Loch Torridon are predominantly sediments, and fine sand and muddy sand extend almost to the shore in many places. Shallow sediments around this part of the loch are well colonised by algae down to a depth of around 10 m. Typical species include *Chorda filum*, *Laminaria saccharina*, *Desmarestia* spp., flocculent brown algae and a number of foliose red algae (Lsac.X). The majority of these rely on stones and shell fragments for attachment. However at some sites off both the north and south coasts, dense mats of loose-lying algae, mainly *Trilliella*, are present at around 9–15 m depth (Tra). These mats typically have brittlestar arms, probably *Amphiura filiformis*, protruding through. A patchy but fairly extensive bed of eelgrass *Zostera marina* is present off the north shore, south-west of Inveralligin, and *Zostera* is also present in Ob Mheallaidh (Zmar). Where infralittoral rock is present, it is predominantly in the form of boulder slopes supporting a silty *L. saccharina* forest and generally heavily grazed. Boulders extend into the circalittoral off some rocky headlands such as Rubha na Feòla and are predominantly covered by encrusting red algae such as *Pseudolithoderma extensum*. Featherstars *Antedon* sp. are common in places, with extensive maerl beds near the loch head.

Steep to vertical bedrock slopes occur mainly in and close to the tide-swept narrows separating Upper Loch Torridon from Loch Shieldaig. On the north side near Port an Lagaidh, these cliffs are dominated by dead-man's fingers *Alcyonium digitatum*. *Laminaria hyperborea* kelp forest is present on infralittoral bedrock on both sides of the rapids. Flattish smooth bedrock occurs in the more tide-swept central parts of the narrows and is dominated almost entirely by *P. extensum*, barnacles and hydroids such as *Tubularia larynx*. An extensive cobble and pebble plain at around 10–15 m depth in the narrows off the north of Eilean a' Chaoil is dominated by a thick bed of brittlestars *Ophiothrix fragilis* and *Ophiocomina nigra*.

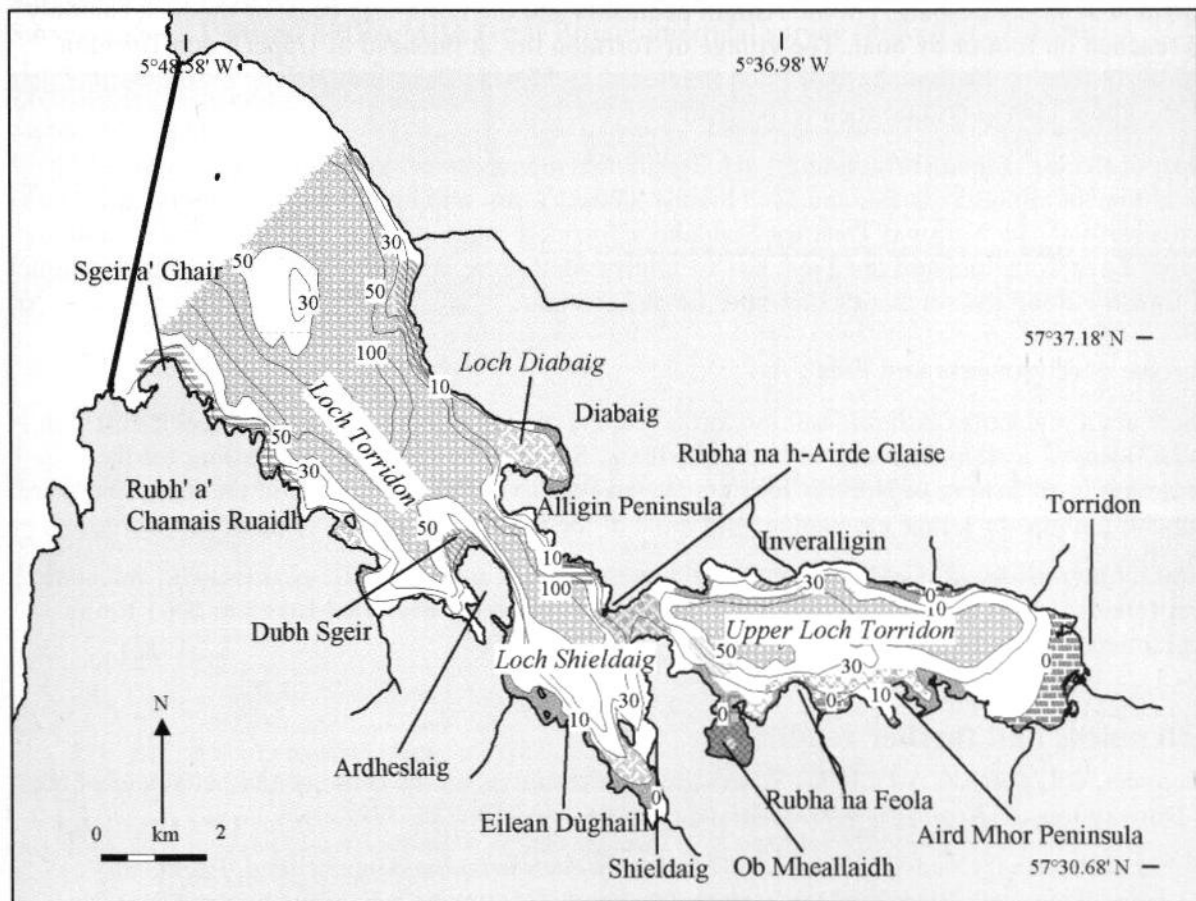
#### Loch Shieldaig

The shallow sublittoral in Loch Shieldaig consists mainly of muddy sediments and boulder slopes similar to those in Upper Loch Torridon. The southern end of the loch is very sheltered and muddy slopes extend up almost to the shore. These slopes are gentle on the east side and steep on the west. The sediment is well worked, for example by the edible crab *Cancer pagurus*, and *Nephrops* burrows are present at around 20–30 m depth. Enhanced currents run between Shieldaig Island and Shieldaig, with *Zostera* and a rich infauna of heart urchins and holothurians occurring in fine muddy sand. At the more northern sites, there is generally a boulder and sediment slope to a variable depth. Off the headland east of Eilean Dùghaill, the boulder slope extends to around 20 m depth and is dominated by thick *Laminaria saccharina* kelp forest to around 10 m depth. Beneath the kelp, the boulders are covered mainly by encrusting algae. Where the kelp thins out there are some foliose algae but these again give way to crusts by 20 m depth. East of the narrows, bedrock and boulders off the headland Rubha na h-Airde Glaise are dominated by *Laminaria hyperborea* kelp forest with some *L. saccharina* and large *Alaria esculenta*. There is heavy grazing except on vertical rock, where a low turf of algae survives. The increased tidal streams in this area not only allow *L. hyperborea* to thrive but also result in an increase in the number of sessile animal species.



## Outer Loch Torridon

Due to the generally sheltered nature of Loch Torridon, it is only in the outer parts that exposed to moderately exposed sites are found. Exposed bedrock and boulder slopes are present on the south side of the loch off headlands such as Rubh' a' Chamais Ruaidh. It is only in the loch entrance, for example around the small islets at Sgeir a' Ghair, that vertical rock faces are exposed to enough wave action to support the jewel anemone *Corynactis viridis*. Vertical, ledged bedrock dominated by *Laminaria hyperborea* kelp forest extends to around 15 m depth, followed by a boulder slope. Unlike most similar sites further into the loch, there is an abundant and varied undergrowth and stipe flora of foliose algae. Increased wave action in shallow depths at these sites probably discourages grazing by *Echinus* sp. Deeper boulders beyond the kelp forest support dense growths of *Trilliella* on their tops, and encrusting algae. Vertical cliffs and steep rock further into the loch on the west side of the Ardheslaig peninsula and Dubh Sgeir extend to around 20 m depth. The rock is rather smooth and heavily grazed and in shallow water supports kelp forest, probably of mixed *L. hyperborea* and *L. saccharina*. The seabed in the many small bays along the south coast consists mainly of muddy sand extending up into shallow water, with lugworms *Arenicola marina* in evidence in the shallows and *Nephrops* burrows in mud at greater depths. Along the much more linear north coast, there appears to be less bedrock, even at the mouth of the loch. At most sites the seabed slopes away as a jumble of loose boulders on sediment, which becomes muddier with increasing depth. In some places there are few boulders and instead a steep sandy or muddy slope. Infralittoral boulders support heavily grazed kelp forest and have a typical bare pink appearance due to encrusting coralline and other algae. Similar habitats are present in the shelter of Loch Diabaig, with mud slopes descending to at least 36 m depth. Extensive areas of coarse sediments



**Figure 22.2** Indicative distribution of the main biotopes in the area (based on data from survey sites shown in Figure 22.1, cited literature and additional field observations).

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occur near the mouth of the outer loch, with extensive maerl-gravel in waves, and live maerl in the furrows.

## Nature conservation

Conservation sites		
Site name	Status	Main features
Loch Torridon	MCA	Marine biological
Shieldaig Woods	SSSI	
Alligin	SSSI	
Loch Torridon	GCR	Geological
Torridon	NTS	Coastal mountains
Shieldaig Island	NTS	Forested island
Wester Ross	NSA	Landscape

## Human influences

### Coastal developments and uses

The A896 road runs down Glen Torridon at the head of the loch and along the south side of Upper Loch Torridon to the head of Loch Shieldaig, before turning southwards across the base of the Applecross peninsula. A minor road continues from Shieldaig along the south coast of the loch. Until this road was built in the 1970s, the crofts strung out along the shores of the Applecross peninsula were extremely remote. Minor roads also run along the northern shore of Upper Loch Torridon as far as Diabaig, but the Alligin peninsula and the north-east coast of the loch can only be reached on foot or by boat. The village of Torridon lies at the head of Upper Loch Torridon, Shieldaig lies on the east shore of Loch Shieldaig, and Inveralligin and Diabaig on the north side of the upper loch and outer loch respectively.

Most of the hinterland surrounding Loch Torridon is mountainous, preventing any major development along the coast, and used mainly as deer forest and by hill walkers and for nature conservation. The National Trust for Scotland's Torridon estate includes the entire north shore of Upper Loch Torridon, and the Trust has a Countryside Centre at Torridon. There is a small amount of forestry along the south side of Upper Loch Torridon.

### Marine developments and uses

There are a number of Atlantic salmon farms and mussel installations throughout Loch Torridon, and a licensed scallop farm site in Loch Shieldaig. Some inshore fishing and potting for the important local fishery of Norway lobsters *Nephrops norvegicus* takes place in the loch. There are launching ramps or jetties associated with most of the small villages and some of the crofts.

After a long history of conflict between fishermen over the use of mobile gear (trawls) and static gear (creels), the whole of Loch Torridon was closed to mobile gear year-round in 2001 for an experimental period of at least two years.

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### Sites surveyed

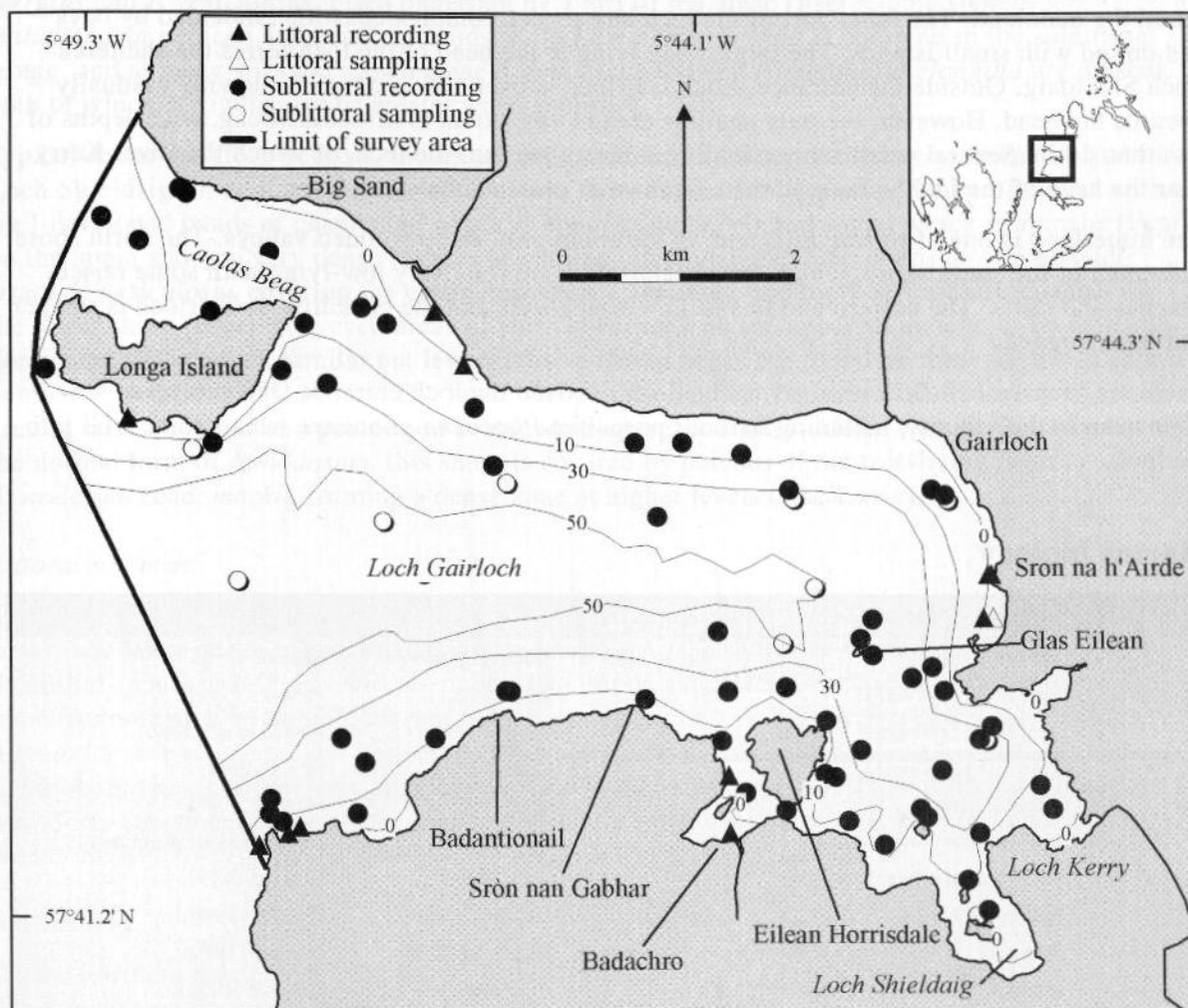
- Survey 53: 1985 Smith Loch Torridon and Loch Carron survey (Smith & Hiscock 1985).
- Survey 63: 1970s Ridley north-west Scotland sublittoral photographic survey (Dipper 1981).
- Survey 86: 1978 Smith Wester Ross littoral survey (Smith 1978).
- Survey 265: 1970–80 SMBA/MBA Great Britain intertidal survey (Powell *et al.* 1980).

Littoral sites					
Survey	Site	Place	Grid reference	Latitude/longitude	Biotores recorded
53	1	Camas a'Chlarsair, Loch Torridon	NG 832 548	57°31.9'N 05°37.3'W	SLR
53	2	Ob Mheallaidh, rapids, Loch Torridon	NG 830 548	57°31.9'N 05°37.5'W	Fserr.T; SLR; Ldig.T
53	3	Ob Mheallaidh, sandbank, Loch Torridon	NG 831 546	57°31.8'N 05°37.4'W	LGS; SLR
53	4	Ob Mheallaidh (north), Loch Torridon	NG 833 544	57°31.7'N 05°37.2'W	SLR
53	5	Ob Mheallaidh, middle rocks, Loch Torridon	NG 831 542	57°31.6'N 05°37.3'W	S; Zmar; SLR
53	6	Ob Mheallaidh, inner, Loch Torridon	NG 833 537	57°31.3'N 05°37.1'W	LMS; SLR
53	15	Rubha na Fearn, Loch Torridon	NG 716 612	57°35.0'N 05°49.2'W	Cor; ELR
53	16	Ob na h-Uamha, Loch Torridon	NG 718 608	57°34.8'N 05°49.0'W	SLR
53	21	Eilean a'Chaoil, Loch Torridon	NG 812 560	57°32.5'N 05°39.2'W	FK
53	22	Sgeir na Trian, Loch Torridon	NG 731 648	57°37.0'N 05°47.9'W	MLR; Cor
86	11	Loch Diabaig, Loch Torridon, Wester Ross	NG 795 602	57°34.6'N 05°41.3'W	MLR
86	12	Torridon, head of Upper Loch Torridon, Wester Ross	NG 895 565	57°32.9'N 05°31.1'W	HedMac SLR
86	13	Ob Mheallaidh, Upper Loch Torridon, Wester Ross	NG 830 540	57°31.4'N 05°37.4'W	LGS SLR
265	54	Bad-callda, Loch Torridon	NG 816 561	57°32.5'N 05°38.9'W	SLR
265	59	Camas an Leim, Loch Torridon	NG 819 554	57°32.1'N 05°38.6'W	SLR
265	68	Eilean a'Chaoil, Loch Torridon	NG 813 562	57°32.5'N 05°39.2'W	SLR
265	92	Ob Mheallaidh entrance, Loch Torridon	NG 828 545	57°31.7'N 05°37.7'W	Fserr.T
265	14	Upper Loch Torridon	NG 890 550	57°32.1'N 05°31.5'W	Ldig.T

<b>Sublittoral sites</b>					
<i>Survey</i>	<i>Site</i>	<i>Place</i>	<i>Grid reference</i>	<i>Latitude/longitude</i>	<i>Biotores recorded</i>
53	2/1	SE of Sgeir na Trian, Loch Torridon	NG 731 648	57°37.0'N 05°47.9'W	SedK; LhypGz
53	3/1	W of Sidhean a' Mhill, Loch Torridon	NG 767 624	57°35.8'N 05°44.2'W	LhypGz
53	4/1	Sgeirean Buide, Loch Shieldaig, Loch Torridon	NG 807 545	57°31.7'N 05°39.8'W	SpMeg.Fun
53	5/1	SW of Sgorr a' Chadail, Upper Loch Torridon	NG 888 567	57°33.1'N 05°31.8'W	SS; IR
53	8/1	Loch Shieldaig, Loch Torridon	NG 812 538	57°31.3'N 05°39.1'W	SpMeg
53	11/1	N of Sròn a' Mahàis, Loch Torridon	NG 782 578	57°33.4'N 05°42.4'W	FaV
53	13/1	Camas an Eilean, Loch Torridon	NG 755 582	57°33.5'N 05°45.2'W	SpMeg
53	14/1	Loch Diabaig, Loch Torridon	NG 796 598	57°34.5'N 05°41.1'W	CMU
53	2/2	NE of Sgeir na Trian, Loch Torridon	NG 732 652	57°37.2'N 05°47.9'W	FaSwV
53	3/2	NW of Sgeir Dùghall, Loch Torridon	NG 770 612	57°35.2'N 05°43.7'W	SS; XKScrR
53	4/2	NE of Doire-aonar, Loch Shieldaig, Loch Torridon	NG 802 540	57°31.4'N 05°40.2'W	LsacX
53	5/2	Between Ob Gorm Beag and Ob Gorm Mór, Loch Torridon	NG 862 561	57°32.7'N 05°34.3'W	LhypLsac; Tra
53	11/2	NW of Sgeir a' Ghair, Loch Torridon	NG 720 617	57°35.3'N 05°48.9'W	LhypR.Ft; LhypGz.Pk
53	13/2	Rubh' a' Ghiubhais, Loch Torridon	NG 822 569	57°33.0'N 05°38.4'W	CR; IR
53	2/3	W of Sgeir na Trian, Loch Torridon	NG 808 542	57°31.5'N 05°39.6'W	Lsac
53	3/3	Mouth of loch (near fishing station), Loch Torridon	NG 750 662	57°37.8'N 05°46.0'W	FaMS
53	4/3	Near Eilean Dùghaill, Loch Shieldaig, Loch Torridon	NG 800 546	57°31.7'N 05°40.5'W	SS; Lsac
53	5/3	S shore near Sròn an Dubh-aird, Upper Loch Torridon	NG 868 551	57°32.2'N 05°33.7'W	IR
53	11/3	Near Rubh' a' Chamais Ruaidh, Loch Torridon	NG 742 595	57°34.2'N 05°46.4'W	MCR; Lhyp
53	13/3	Near Dubh Sgeir, Loch Torridon	NG 777 580	57°33.5'N 05°43.0'W	CR; SS; Lhyp
53	2/4	Loch Shieldaig, Loch Torridon	NG 812 536	57°31.2'N 05°39.1'W	SpMeg; PhiVir
53	3/4	SW of Craig, Loch Torridon	NG 767 629	57°36.1'N 05°44.2'W	VirOph
53	4/4	E of Ardheslaig, Loch Shieldaig, Loch Torridon	NG 788 565	57°32.7'N 05°41.8'W	SS; IR
53	5/4	Near Torridon House, Loch Torridon	NG 863 569	57°33.1'N 05°34.3'W	Asc.Asc; Lsac.Ldig
53	11/4	Loch a' Chracaich, Loch Torridon	NG 760 573	57°33.0'N 05°44.6'W	FaMS; Lsac
53	4/5	Rubha na h-Airde Glaise, Loch Torridon	NG 805 566	57°32.8'N 05°40.1'W	Lhyp.TPk
53	5/5	SW of Inveralligin, upper Loch Torridon	NG 838 570	57°33.1'N 05°36.8'W	Zmar; IR
53	11/5	N of Eilean a' Chaoil, Loch Torridon	NG 812 566	57°32.8'N 05°39.4'W	LhypGz; FaAIC; Oph; Phy
53	4/6	Near Port Làire, Loch Torridon	NG 799 576	57°33.3'N 05°40.7'W	SS; IR
53	5/6	Near Rubha na Feòla, Loch Torridon	NG 843 553	57°32.2'N 05°36.2'W	LsacX; Tra
53	11/6	Near Port an Lagaidh, Loch Torridon	NG 812 567	57°32.9'N 05°39.4'W	AlcC
53	4/7	Near Araid, Loch Torridon	NG 789 585	57°33.8'N 05°41.7'W	SS; IR
53	5/7	Skerry E of Camas an Léim, Loch Torridon	NG 824 557	57°32.4'N 05°38.1'W	SS
53	11/7	Near Lower Diabaig, Loch Diabaig, Loch Torridon	NG 796 598	57°34.5'N 05°41.1'W	SS; IR
63	9	Loch Torridon	NG 780 580	57°33.4'N 05°42.6'W	CR

## Location

Position (centre)	NG 768 760	57°43'N 05°45'W
Administrative area	Highland	
Conservation agency/area	Scottish Natural Heritage	North Areas



**Figure 23.1** Main features of the area, showing sites surveyed.

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## Physical features

Physiographic type	Open sealoch
Length of coast	29.8 km (41.7 km including islands)
Length of inlet	7.2 km
Area of inlet	30.0 km <sup>2</sup> (28.3 km <sup>2</sup> excluding islands)
Bathymetry	Maximum depth 64 m
Wave exposure	Mostly exposed; sheltered to very sheltered near head
Tidal streams	Generally weak; moderately strong through Caolas Beag
Tidal range	4.6 m (mean springs); 2.2 m (mean neaps) (Gairloch)
Salinity	Fully marine

## Introduction

Loch Gairloch is a short, open sealoch with no sills or basins situated in an area of Torridonian sandstone in Wester Ross between Loch Torridon (*Area summary 22*) and Loch Ewe (*Area summary 24*). Its open nature is unusual for sealochs on this part of the Scottish coast, and is reflected in clearer and slightly warmer water compared to nearby Loch Ewe, with a bias towards semi-exposed communities typical of open sealochs. Loch Gairloch opens directly to the west but turns to the south-east where it narrows near the head. Lying almost due east of the northernmost tip of Skye, it receives very little shelter from the latter and is exposed along much of its length. Longa Island lies in the mouth off the north coast, with a tide-swept sound, Caolas Beag, between it and the mainland. The inner part of the loch has a more complex coastline, indented by bays and dotted with small islands. The largest bay lying at the head of the loch forms the sheltered Loch Shieldaig. Outside the entrance, Loch Gairloch is over 100 m deep, shallowing gradually towards the head. However, the only shallow area of any extent is in Caolas Beag, with depths of less than 10 m. Several small salmon and trout rivers run into the loch, of which the River Kerry near the head of the loch is famed for its freshwater pearl mussels.

The hinterland is one of rolling hills and, in the south-east, steep wooded valleys. The north shore and much of the south shore, which are of sandstone, are relatively low-lying with some raised beaches and cliffs. The eastern end lies in Lewisian gneiss and the backdrop to Gairloch is steeper and more rugged.

There are grey seal *Halichoerus grypus* haul-outs around the loch entrance, and cetaceans are often seen in the vicinity, including harbour porpoises *Phocoena phocoena* which come well into the loch.

## Marine biology

### Marine biological surveys

	Survey methods	No. of sites	Date(s) of survey	Source
<i>Littoral</i>	Recording (epibiota)	5	June 1990	Howson (1991)
	Recording (epibiota)	5	August 1979	Powell <i>et al.</i> (1980)
	Recording (epibiota)	1	August 1978	Smith (1978)
	Infaunal sampling (core)	1	June 1990	Howson (1991)
	Infaunal sampling (cores)	2	Not stated	Eleftheriou & McIntyre (1976)
<i>Sublittoral</i>	Recording (epibiota)	32	June 1990	Howson (1991)
	Recording (epibiota)	29	September 1989	Gubbay (1990)
	Recording epibiota (glass viewer)	6	September 1989	Gubbay (1990)
	Infaunal sampling (dredge)	8	June 1990	Howson (1991)

### Littoral

Only around 5% of Loch Gairloch is intertidal. The majority of the shoreline consists of steep, exposed to moderately exposed bedrock, but there are two long sandy beaches at Gairloch and Big Sand, and, near the head of the loch, areas of sandy mud, cobbles and boulders on the extremely sheltered shores at Badachro, Loch Shieldaig, Loch Kerry, and Charlestown.

### *Littoral rock*

Bedrock shores in the main body of Loch Gairloch, north and west of the constriction between Eilean Horrisdale and Sròn na h'Airde, are exposed or moderately exposed to wave action and are dominated by barnacles, red algae, bladder wrack *Fucus vesiculosus* f. *linearis* and mussels *Mytilus edulis*. The shores are rugged with ledges, steps, vertical faces and crevices. Most consist of Torridonian sandstone which provides a pitted and fissured surface. Where the bedrock is Lewisian gneiss, such as on rocky headlands on the east coast at Gairloch, the surface is smoother

and species diversity is lower, although the basic communities remain the same. The extent and zonation of these communities thus varies with the slope and nature of the shore. On the south-west side of Longa Island, shallow rockpools are common (Cor). At most sites there is a well-developed and often wide lichen zone with both yellow and grey lichens (YG) and *Verrucaria maura* on open rock (Ver.Ver). Fucoids *Pelvetia canaliculata* and *Fucus spiralis* are typically present below the lichens (PelB; Fspi). The mid-shore is dominated by barnacles *Semibalanus balanoides* and *F. vesiculosus* (FvesB) with limpets *Patella vulgata* common. Vertical fissured rock is typically dominated by *S. balanoides* with extensive patches of *M. edulis* (MytFves). On less steep rock, a greater amount of *F. vesiculosus* is present. The lower shore supports *Fucus serratus* and *F. vesiculosus*, often underlain by a turf of red algae (Fser.R), the sponge *Halichondria panicea* and small hydroids. Kelp *Laminaria digitata* is common in the sublittoral fringe, and at many sites the brown algae *Alaria esculenta* and *Himanthalia elongata* are present, both of which are indicative of greater wave exposure.

Typical sheltered, steep bedrock shores are present along the sides of the bay at Badachro and in Loch Shieldaig. In contrast to exposed bedrock, these shores are dominated by fucoid algae with well-developed bands of channelled wrack *P. canaliculata* (Pel) and spinal wrack *F. spiralis* (Fspi) on the upper shore, a very dense blanket of knotted wrack *Ascophyllum nodosum* and bladder wrack *F. vesiculosus* covering the entire mid-shore (Asc.Asc), and toothed wrack *F. serratus* on the lower shore (Fser). However, areas of vertical bedrock on the upper shore tend to be barnacle-dominated (BPat.Sem). Similar but less extensive lichen zones are found on these sheltered shores compared to the exposed shores. The lower shore at the head of Badachro inlet consists of a wide area of mixed cobbles and pebbles on coarse shell-gravel and mud. Along with *F. vesiculosus* and the normal form of *A. nodosum*, this shore is covered by patches of the free-living form *A. nodosum* ecad. *mackii*, forming a dense zone at higher levels (AscX.mac).

#### *Littoral sediment*

There are extensive clean sandy beaches at Big Sand on the north coast and at Gairloch on the east coast. The latter beach is heavily used for recreation. These shores have not been surveyed in detail but appear to be fairly species-poor, as would be expected at such semi-exposed sites. The fauna is dominated by amphipods and polychaete worms, especially *Nephtys cirrosa*. The bivalves *Angulus tenuis* and *Ensis* sp., lugworms *Arenicola marina* and the burrowing sea urchin *Echinocardium cordatum* have all been recorded from these beaches. Areas of mixed muddy sediments and stones in Badachro inlet and in Loch Shieldaig, and a little mud in Loch Kerry where the River Kerry enters the loch, form the only other sediment shores.

#### **Sublittoral**

On the northern side of the loch, the seabed slopes moderately steeply from the shore down to 20 m depth and then very gradually to 50 m and beyond. Where bedrock and boulder slopes occur, their extent varies, to around 15 m depth. On the southern shore from the mouth to Badantionail, broken bedrock leads down from the shore, followed by boulders and angular blocks giving way to sediment at around 20 m depth. The deepest rock slopes are on the north side of Eilean Horrisdale and on Glas Eilean extending to 15–24 m depth. Both bedrock and boulder slopes occur in the sheltered inner parts of the loch. In Loch Shieldaig, the rock slope reduces from 15 m in the entrance to only 4 m at the head.

#### *Infralittoral rock*

Because Loch Gairloch is relatively exposed, *Laminaria hyperborea* is the predominant kelp on shallow rock around much of the loch. On the north side *L. hyperborea* forest extends from the entrance as far as Gairloch in the north-east corner (Lhyp.Ft). It also occurs around Glas Eilean. Along the south side of the loch, it extends from the mouth as far east as Badantionail. East of this there is a silty mixed kelp forest mainly around Eilean Horrisdale, with both *L. hyperborea* and *L. saccharina*, and occasionally *Saccorhiza polyschides* (LhypLsac.Ft). At Glas Eilean there is a

band of *L. hyperborea* above the mixed kelp forest. The more sheltered inner loch south-east of Eilean Horrisdale supports a cape-form *L. saccharina* forest. Most kelp forest throughout the loch has a dense understory flora of foliose and filamentous algae, at least during the early summer, with dense growths of Ectocarpaceae, *Desmarestia* spp., *Dictyota dichotoma* and many red algae. Comparisons of surveys done in early summer and early autumn suggest that increased grazing pressure and the disappearance of early rapidly growing species may greatly reduce the underflora as the summer progresses. A similar phenomenon has been noted in Loch Ewe (Area summary 24). *L. hyperborea* forest extends to a depth of around 10 m predominantly over a substratum of large boulders with steep bedrock in some places. Scattered kelp plants extend down through the lower infralittoral to around 15 m depth.

There are also small bedrock outcrops from the shallow sand-plains of Caolas Beag. In the inner part of the loch, including the small islands in and around Loch Shieldaig, there are bedrock slopes with platforms, small vertical faces, large fissures and crevices. These sheltered sites support large cape-form *L. saccharina* plants with some *Chorda filum*, especially at the rock-sediment boundary (Lsac.Ft). Understorey brown algae are common with dense red algae in places. The fauna is sparse but vertical faces support a few species such as the cup coral *Caryophyllia smithii* and some ascidians including *Ciona intestinalis* and *Ascidia mentula*. The mobile fauna are those commonly found in most kelp forests, such as the grazing common urchin *E. esculentus* and the topshell *Gibbula cineraria*.

#### *Circalittoral rock*

There are no areas of deep, sheltered bedrock in Loch Gairloch. Even at the entrance, sublittoral bedrock does not extend much below 20 m depth. In the entrance to the loch, the seabed at many sites consists of a gradual slope of boulders and cobbles lying on shell-gravel and sand. In the circalittoral at depths of more than 15 m or so, beyond the kelp forests, boulders support mainly encrusting species, including encrusting algae, the bryozoan *Parasmittina trispinosa* and the keel worm *Pomatoceros triqueter*, and a range of ascidians including *Clavelina lepadiformis*, *Ciona intestinalis*, *Corella parallelogramma* and *Ascidia aspersa*. Other erect sessile filter and suspension feeders include hydroids such as *Nemertesia* spp., and scattered foliose algae occur in varying amounts (e.g. FaAIC, SubSoAS and AmenCio). Spaces between the boulders are home to the squat lobster *Munida rugosa* and other cryptic species. Circalittoral rock in the inner areas to the north and east of Eilean Horrisdale is a mixture of bedrock and boulders on muddy shell-gravel. The species present are very similar to those in the outer regions. Where vertical rock is present, *C. intestinalis* sometimes covers large areas, and featherstars *Antedon* spp. may also be abundant.

#### *Sublittoral sediment*

Sublittoral sediments in Loch Gairloch are mostly coarse and sandy, reflecting the exposed nature of the loch, with soft mud found only in the environs of Loch Shieldaig and in the deeper central parts. Plains of fine sand fringe much of the loch stretching along the north coast, parts of the south coast and into the middle of the small bay of Loch Kerry. Sediment may extend up into very shallow water or begin at the bottom of a short rock slope. Fine sand substratum extends to around 8 m depth, and down to 16 m at the more exposed sites along the middle of the north coast. The sand is characterised by large infaunal species, especially the heart urchin *Echinocardium cordatum*, the burrowing sea cucumber *Labidoplax digitata*, the burrowing brittlestar *Amphiura filiformis*, razor clams *Ensis* spp., various other bivalves, and polychaete worms (EcorEns). Lugworms *Arenicola marina* and edible crabs *Cancer pagurus* throw the sediment up into mounds and hollows, and other casts and holes are also frequent. Algae are not generally common due to the lack of stones for attachment, but in shallow water filamentous brown algae may be common. At the south-eastern entrance of Caolas Beag there is a patchy bed of eelgrass *Zostera marina* (Zmar). The sediment here is slightly coarser in the increased tidal currents.



The coarsest sediments are found at the entrance to the loch. To the north and west of Longa Island there is a plain of coarse clean mobile stone-gravel and shell-gravel at a depth of 16–18 m. The gravel is thrown up into waves and supports species typical of coarse sediments, such as the sea cucumber *Neopentadactyla mixta*, the anemone *Peachia cylindrica*, the razor clam *Ensis arcuatus* and other more widespread species including scallop *Pecten maximus* and the tubeworm *Chaetopterus variopedatus* (Ven.Neo). A similar coarse mobile shell-gravel with scattered maerl *Phymatolithon calcareum* is found at slightly shallower depths in the entrance area along the south coast at least as far east as Badantionail (Phy). However, this sediment has a much greater species diversity, partly because numerous pebbles and whole shells provide attachment for algae, hydroids and ascidians especially *Ascidiella aspersa*. Algae include scattered *Laminaria saccharina* and *Desmarestia* spp. and many other smaller species, with some, such as *Scinaia turgida*, characteristic of mobile substrata. The habitat is very species rich, supporting most infauna described above plus many others.

The south-eastern section of Loch Gairloch east of Sròn nan Gabhar also has predominantly gravelly sediments in shallower water between 15 m and 30 m depth, often following on from rocky slopes, but since this area is more sheltered than the outer loch, these tend to be muddy gravels with an increasing proportion of mud towards the head of the loch. A variety of widely distributed species is present in sediments of this type but the most conspicuous in Loch Gairloch is *Ophiura ophiura*. Other common species include *P. maximus*, the gastropods *Turritella communis* and *Aporrhais pespelecani* and, at some sites, sea-pens *Virgularia mirabilis* and *Pennatula phosphorea* (VirOph). At a few sites, large pieces of shell debris allow the attachment of ascidians *Ciona intestinalis* and *A. aspersa* and a few hydroids (VirOph.HAs).

The deep central areas of Loch Gairloch, between about 35 m and 70 m along the whole length, consist of soft mud with slightly sandier mud towards the entrance. These areas, surveyed by dredging in the deeper areas, support a variety of species typical of soft sediments, including brittlestars *Amphiura* spp., the bivalve *Abra alba*, a variety of small polychaete worms, burrowing holothurians such as *Leptopentacta elongata* and sea-pens *P. phosphorea* (SpMeg). Similar soft mud occurs in the inner area of the loch below about 20 m and is heavily worked by the Norway lobster *Nephrops norvegicus* and possibly other mound and burrow-making species (SpMeg). Where the mud is slightly firmer and sandier there are larger numbers of *P. phosphorea* along with some *V. mirabilis* and *Ophiura* spp. Soft muddy sediments are also found in shallow water above 10 m but only in extreme shelter, such as the bay at Badachro, to the east of Eilean Horrisdale and at the southern end of Loch Shieldaig. These sediments have a patchy to continuous cover of loose-lying mats of filamentous red and brown algae, especially *Trailiella*. Areas not covered by these mats support species such as bootlace weed *Chorda filum*, lugworms *A. marina* and other sediment species (Tra; Lsac.X).

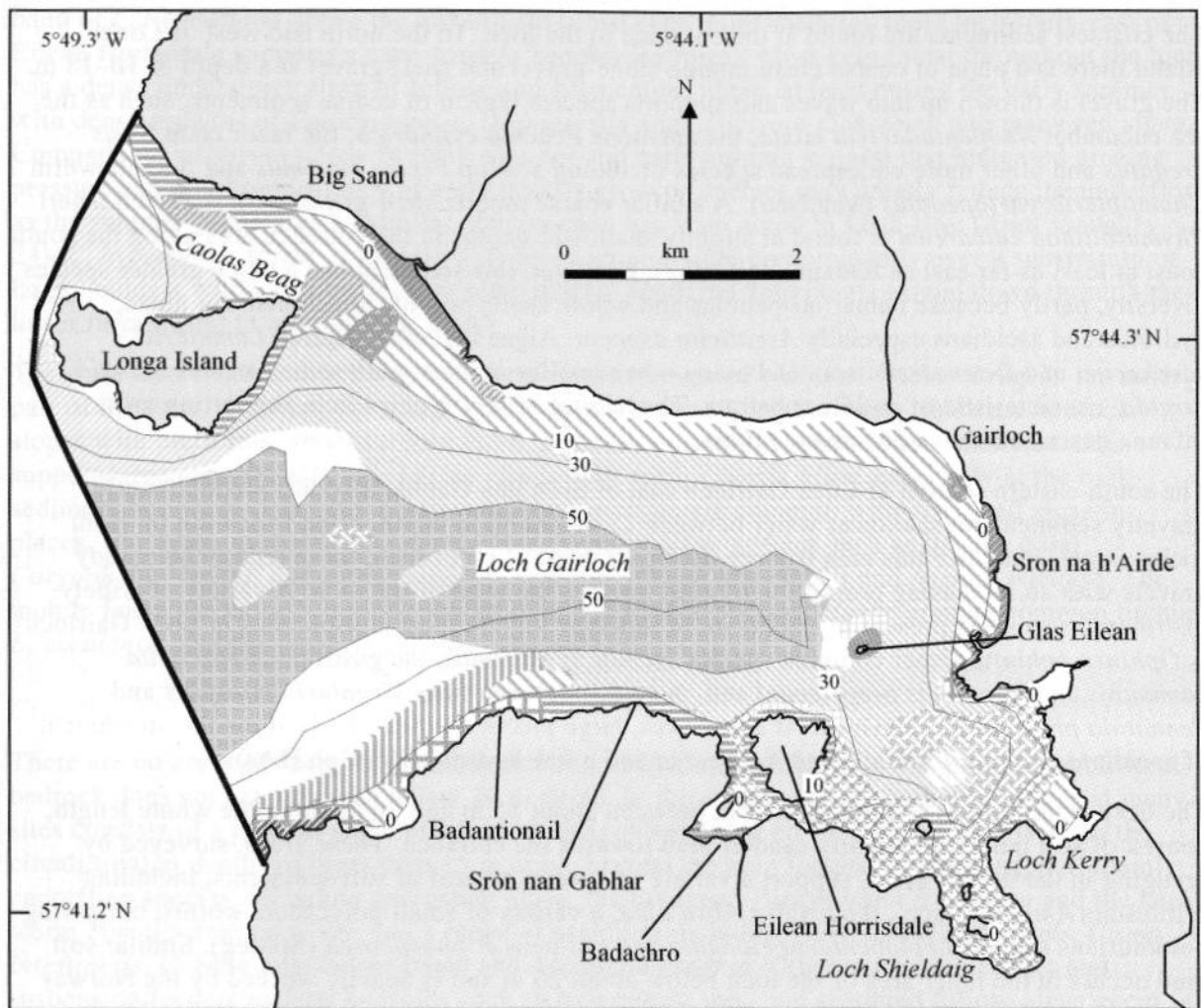
## Nature conservation

Conservation sites		
Site name	Designation	Main features
Coille Dubh	SSSI	Botanical
Wester Ross	NSA	Landscape

## Human influences

### Coastal developments and uses

There is good road access around most of Loch Gairloch, and the coastline is relatively developed and popular with tourists. Gairloch and associated villages are spread out along the north-east and east coastline and there are other villages along the south coast. The beach at Gairloch is one of the most heavily used in the Scottish Highlands and the town and surrounding area offer plenty of



**Figure 23.2** Indicative distribution of the main biotopes in the area (based on data from survey sites shown in Figure 23.1, cited literature and additional field observations).

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accommodation and facilities to visitors, including a heritage museum. Big Sand on the north-west coast is backed by sand dunes and has a large caravan park and watersports centre. Following extensive erosion in 1993 of the dunes protecting Gairloch golf course, a project to reinforce and re-profile the dunes was undertaken, taking sand from a bar on the beach which had formed after the erosion. Supported by dune stabilisation work and marram planting, the dunes have proved sufficiently robust to protect the golf course while retaining a natural appearance.

#### Marine developments and uses

Pleasure cruises and sea-angling trips leave from the pier at Gairloch. As well as the harbour in Gairloch, there are a number of other jetties and landing slips around the loch, such as at Badachro and Charlestown. The area is regularly visited by yachts, which can moor in the sheltered Loch Shieldaig, and there is a considerable amount of canoeing, wind-surfing and to a lesser extent sub-aqua diving.

At the time of the 1990 MNCr survey, much sewage from Gairloch was discharged untreated directly into the loch through eight main outfalls, as was sewage from Badachro village and Big Sand, and there were numerous other small outfalls discharging raw sewage or effluent from septic tanks.

At the time of the 1990 MNCR survey, six mussel or oyster farm leases had been granted in Loch Gairloch. There were no Atlantic salmon farms, although there is a licensed marine site, and there is a freshwater hatchery site upstream on the River Kerry. Commercial fishing boats use the small harbour at Gairloch and some landings are made there, but until 2003 Loch Gairloch was the only area in Sector 15 protected by a full-year closure prohibiting the use of mobile fishing-gear under the Inshore Fishing (Prohibition of Fishing and Fishing Methods) Order 1989 (see *Area summary* 22). There is some creeling for lobsters *Homarus gammarus* and crabs.

## References and further reading

- Eleftheriou, A. & McIntyre, A.D. 1976. *The intertidal fauna of sandy beaches – a survey of the Scottish coast*. Aberdeen, Department of Agriculture and Fisheries for Scotland. (Scottish Fisheries Research Report, No. 6.)
- Gubbay, S. 1990. Seasearch survey of Gruinard Bay, Loch Ewe and Loch Gairloch. (Contractor: Marine Biological Consultants, Ross-on-Wye.) *Nature Conservancy Council, CSD Report*, No. 1082. (MBC report, No. 89/SS/4.)
- Howson, C.M. 1991. Surveys of Scottish sealochs. Loch Gairloch and Loch Ewe. (Contractor: University Marine Biological Station, Millport.) *JNCC Report*, No. 15.
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- Smith, S.M. 1978. Shores of Wester Ross, with emphasis on the Mollusca of rocky shores. (Contractor: S.M. Smith, Edinburgh.) *Nature Conservancy Council, CSD Report*, No. 227.

## Sites surveyed

- Survey 30: 1990 UMBSM Loch Gairloch and Loch Ewe survey (Howson 1991).
- Survey 86: 1978 Smith Wester Ross littoral survey (Smith 1978).
- Survey 265: 1970–80 SMBA/MBA Great Britain intertidal survey (Powell *et al.* 1980).
- Survey 283: 1989 Seasearch: Gruinard Bay, Loch Ewe and Loch Gairloch survey (Gubbay 1990).
- Survey 326: 1965–70 DAFS Scottish littoral sediment survey (Eleftheriou & McIntyre 1976).

Littoral sites					
Survey	Site	Place	Grid reference	Latitude/longitude	Biotores recorded
30	11	Shore at Badachro Inn, Loch Gairloch	NG 782 738	57°41.9'N 05°43.3'W	FvesX; AscX.mac; Ver.Ver; Pel
30	13	Shore W of Caolas Bad a'Chrotha, Loch Gairloch	NG 781 742	57°42.2'N 05°43.4'W	YG; Ver.Ver; Fspi; Asc.Asc; Pel; BPat.Sem
30	18	Shore W of Gairloch Church, Loch Gairloch	NG 804 759	57°43.2'N 05°41.2'W	YG; Ver.Ver; FvesB; Fspi; Fser.R; PelB
30	29	Shore, headland, Cnoc a' Carn Dearg, Loch Gairloch	NG 760 777	57°44.0'N 05°45.7'W	YG; FvesB; Fspi; PelB
30	36	Shore S of Eag Mhór, Longa Island, Loch Gairloch	NG 731 773	57°43.6'N 05°48.6'W	Cor; FK; FvesB; Fser.R; PelB
86	C	Loch Gairloch, Wester Ross	NG 803 759	57°43.2'N 05°41.3'W	MLR AP.Pon
265	77	Gairloch Head, Loch Gairloch	NG 804 756	57°43.0'N 05°41.2'W	
265	78	Big Sand, Loch Gairloch	NG 757 782	57°44.2'N 05°46.1'W	
265	115	Sròn na Carra 1, Loch Gairloch	NG 742 737	57°41.7'N 05°47.3'W	ELR
265	116	Sròn na Carra 2, Loch Gairloch	NG 744 738	57°41.8'N 05°47.1'W	MLR
265	117	Sròn na Carra 3, Loch Gairloch	NG 745 738	57°41.8'N 05°47.0'W	Cor MytB BPat.Cht

<b>Littoral sites</b>					
<i>Survey</i>	<i>Site</i>	<i>Place</i>	<i>Grid reference</i>	<i>Latitude/longitude</i>	<i>Biotores recorded</i>
326	13	Gairloch, Loch Gairloch	NG 804 756	57°43.0'N 05°41.2'W	AP.P; AP.Pon; AEur; Tal
326	14	Big Sand, Loch Gairloch	NG 756 783	57°44.3'N 05°46.2'W	AP.P; AP.Pon; AEur; BarSnd
<b>Sublittoral sites</b>					
<i>Survey</i>	<i>Site</i>	<i>Place</i>	<i>Grid reference</i>	<i>Latitude/longitude</i>	<i>Biotores recorded</i>
30	1	Loch Kerry, Loch Gairloch	NG 809 740	57°42.1'N 05°40.6'W	EcorEns
30	2	NW Ard Ialltaig, Loch Gairloch	NG 806 738	57°42.0'N 05°40.9'W	AmenCio; VirOph; Lsac.Ft
30	3	N of Eilean Shieldaig, Loch Shieldaig, Loch Gairloch	NG 803 730	57°41.6'N 05°41.2'W	Lsac.Ft; Tra
30	4	N of Fraoch-eilean, Loch Gairloch	NG 798 739	57°42.0'N 05°41.7'W	AmenCio; VirOph.HAS; Lsac.Pk
30	5	Flowerdale Bay, Loch Gairloch	NG 803 745	57°42.4'N 05°41.3'W	SpMeg
30	6	Pinnacle, centre of Flowerdale Bay, Loch Gairloch	NG 799 743	57°42.3'N 05°41.6'W	AmenCio; VirOph
30	7	Sròn na h-Airde, Loch Gairloch	NG 797 751	57°42.7'N 05°41.9'W	FaAIC; VirOph; LhypGz.Ft
30	8	NE corner, Eilean Horrisdale, Loch Gairloch	NG 790 747	57°42.5'N 05°42.6'W	VirOph; AntAsH; Ven.Neo
30	9	Sgeir Dubh Bheag, Loch Gairloch	NG 790 742	57°42.2'N 05°42.4'W	Lsac.Ft; Peri
30	10	Channel S of Eilean Horrisdale, Loch Gairloch	NG 786 739	57°42.0'N 05°42.9'W	Tra
30	12	S Caolas Bad a'Chrotha, Loch Gairloch	NG 783 741	57°42.1'N 05°43.2'W	Tra
30	14	E of Rubha na Moine, Loch Gairloch	NG 781 745	57°42.3'N 05°43.4'W	AlcByH; XKScrR; LsacX
30	15	N of Rubha na Moine, Loch Gairloch	NG 781 749	57°42.6'N 05°43.4'W	SpMeg
30	16	Slope N of Eilean Horrisdale, Loch Gairloch	NG 786 750	57°42.6'N 05°42.9'W	FaAIC; VirOph; Lhyp.Pk
30	17	N of Glas Eilean, Loch Gairloch	NG 793 754	57°42.8'N 05°42.3'W	FaAIC; VirOph.HAS; Lhyp.Ft; XKScrR
30	19	Off Auchtercairn, Strath Bay, Loch Gairloch	NG 800 766	57°43.5'N 05°41.7'W	XKScrR; EcorEns
30	20	S of Lonemore, Loch Gairloch	NG 783 770	57°43.6'N 05°43.4'W	VirOph; EcorEns
30	21	W of Strath Bay, Loch Gairloch	NG 775 764	57°43.3'N 05°44.1'W	SpMeg
30	22	Sròn nan Gabhar, Loch Gairloch	NG 774 749	57°42.5'N 05°44.1'W	VirOph.HAS
30	23	An Oirthir, Loch Gairloch	NG 778 771	57°43.7'N 05°43.9'W	EcorEns
30	24	Leac Bad an Tionail, Loch Gairloch	NG 763 749	57°42.5'N 05°45.3'W	Phy.HEc; EcorEns; LhypGz.Pk
30	25	Port Henderson Bay, Loch Gairloch	NG 750 739	57°41.9'N 05°46.5'W	EcorEns
30	26	Offshore, Sròn na Carra, Loch Gairloch	NG 743 740	57°42.0'N 05°47.3'W	Phy.HEc
30	27	N of Sròn na Carra, Loch Gairloch	NG 742 739	57°41.9'N 05°47.3'W	LhypGz.Ft
30	28	SE of Ceann a'Chreagan, Loch Gairloch	NG 760 773	57°43.8'N 05°45.7'W	LsacX
30	30	E of Longa Island, Loch Gairloch	NG 747 775	57°43.9'N 05°47.0'W	VirOph.HAS
30	31	E end of Caolas Beag channel, Loch Gairloch	NG 750 782	57°44.2'N 05°46.7'W	Zmar
30	32	SE Rubha Bàn, Loch Gairloch	NG 735 792	57°44.7'N 05°48.3'W	Lhyp.Ft; EcorEns
30	33	Channel N of Longa Island, Loch Gairloch	NG 728 790	57°44.6'N 05°49.0'W	Ven.Neo
30	34	E of Camas na Rainich, Loch Gairloch	NG 753 781	57°44.1'N 05°46.5'W	XKScrR
30	35	W Longa Island, Loch Gairloch	NG 724 777	57°43.9'N 05°49.4'W	Ven.Neo; FaAIC
30	37	S of Sròn na Caillich, Longa Island, Loch Gairloch	NG 738 770	57°43.6'N 05°47.9'W	Ven.Neo; FaAIC

<b>Sublittoral sites</b>					
<i>Survey</i>	<i>Site</i>	<i>Place</i>	<i>Grid reference</i>	<i>Latitude/longitude</i>	<i>Biotores recorded</i>
30	38	Flowerdale Bay, Loch Gairloch	NG 803 745	57°42.4'N 05°41.2'W	SpMeg
30	39	NW of Glas Eilean, Loch Gairloch	NG 789 758	57°43.0'N 05°42.7'W	BrAs
30	40	SE of Longa Island, Loch Gairloch	NG 787 765	57°43.4'N 05°42.9'W	VirOph
30	41	N Glas Eilean, Loch Gairloch	NG 786 753	57°42.8'N 05°42.9'W	SpMeg
30	42	S of Cnoc a Carn Dearg, Loch Gairloch	NG 763 767	57°43.4'N 05°45.3'W	VirOph
30	43	SE of Longa Island, Loch Gairloch	NG 753 764	57°43.2'N 05°46.4'W	SpMeg
30	44	Centre of outer loch, Loch Gairloch	NG 756 759	57°43.0'N 05°46.0'W	VirOph.HAs
30	45	Between Longa Island and Sròn na Carra, Loch Gairloch	NG 740 759	57°42.9'N 05°47.6'W	VirOph
283	1	Lonemore, Loch Gairloch	NG 787 767	57°43.5'N 05°43.0'W	LsacX EcorEns
283	2	Sròn nah Airde, Loch Gairloch	NG 800 750	57°42.6'N 05°41.6'W	SpMeg VirOph.HAs XKScrR Lsac
283	3	S of Rubha Bàn, Loch Gairloch	NG 732 788	57°44.5'N 05°48.6'W	LsacX EcorEns
283	4	N Caolas Beag, Loch Gairloch	NG 736 792	57°44.7'N 05°48.2'W	Zmar Lhyp.Ft
283	5	NE Longa Island, Loch Gairloch	NG 738 782	57°44.2'N 05°48.0'W	LsacX XKScrR LhypLsac Lsac
283	6	Glas Eilean, Loch Gairloch	NG 794 753	57°42.8'N 05°42.2'W	Aasp Lhyp.Ft LhypLsac Lhyp
283	7	An Oirthir, Loch Gairloch	NG 774 771	57°43.7'N 05°44.3'W	LsacX EcorEns
283	8	N of Glas Eilean, Loch Gairloch	NG 794 756	57°42.9'N 05°42.2'W	IMS SCR
283	9	E of Longa Island, Loch Gairloch	NG 746 781	57°44.1'N 05°47.2'W	LsacX EcorEns
283	10	Caolas Beag Narrows, Loch Gairloch	NG 743 787	57°44.4'N 05°47.5'W	LsacX Zmar EcorEns
283	11	N of Port Henderson, Loch Gairloch	NG 749 746	57°42.3'N 05°46.7'W	CMS
283	12	Nares Rock, Loch Gairloch	NG 751 744	57°42.1'N 05°46.5'W	XKScrR
283	13	Rubha mhic Chonnuill, Loch Gairloch	NG 795 737	57°41.9'N 05°42.0'W	Tra
283	14	Well Rock, Loch Gairloch	NG 792 739	57°42.0'N 05°42.3'W	Aasp FaMx LsacX Lsac
283	15	Sròn na Carra, Loch Gairloch	NG 744 739	57°41.9'N 05°47.1'W	LhypGz XKScrR
283	16	N of Sròn a'Mhuilt, Loch Gairloch	NG 757 746	57°42.3'N 05°45.9'W	LhypGz XKScrR
283	17	Leac Bad an Tionail, Loch Gairloch	NG 763 750	57°42.5'N 05°45.3'W	Phy
283	18	NE of Eileann Horrisdale, Loch Gairloch	NG 793 745	57°42.3'N 05°42.3'W	Aasp LhypGz Lsac
283	19	Ard Lallaig, Loch Gairloch	NG 803 738	57°42.0'N 05°41.2'W	Aasp LhypLsac Lsac

<b>Sublittoral sites</b>					
<i>Survey</i>	<i>Site</i>	<i>Place</i>	<i>Grid reference</i>	<i>Latitude/longitude</i>	<i>Biotopes recorded</i>
283	20	E coast Longa Island, Loch Gairloch	NG 744 777	57°43.9'N 05°47.4'W	SpMeg VirOph VirOph.HAs Tra
283	21	Carn Dearg, Loch Gairloch	NG 762 769	57°43.5'N 05°45.5'W	SpMeg VirOph.HAs
283	22	Fraoch Eilean, Loch Gairloch	NG 798 740	57°42.1'N 05°41.7'W	SpMeg VirOph.HAs LhypLsac Tra
283	23	Reef W of Glas Eilean, Loch Gairloch	NG 781 755	57°42.8'N 05°43.5'W	
283	24	W of Gairloch Hotel, Loch Gairloch	NG 799 767	57°43.5'N 05°41.8'W	SpMeg VirOph VirOph.HAs
283	25	Sròn na h-Airde, Loch Gairloch	NG 799 752	57°42.7'N 05°41.7'W	SpMeg VirOph.HAs
283	26	Flowerdale Bay, Loch Gairloch	NG 804 747	57°42.5'N 05°41.2'W	Beg
283	27	Loch Kerry, Loch Gairloch	NG 808 742	57°42.2'N 05°40.7'W	Tra
283	28	NE of Sgeir Dubh Bheag, Loch Gairloch	NG 790 743	57°42.2'N 05°42.5'W	SpMeg VirOph.HAs FaMx LsacX Tra Lsac
283	29	Eileah an t-Sabhail, Loch Gairloch	NG 802 734	57°41.8'N 05°41.3'W	Tra

Location		
Position (centre)	NG 849 872	57°49'N 05°38'W
Administrative area	Highland	
Conservation agency/area	Scottish Natural Heritage	North Areas
Physical features		
Physiographic type	Fjordic sealoch	
Length of coast	51.6 km (62.3 km including islands)	
Length of inlet	13.6 km	
Area of inlet	48.5 km <sup>2</sup> (45.0 km <sup>2</sup> excluding islands)	
Bathymetry	Maximum depth: 73 m inner basin; 49 m outer basin	
Wave exposure	Very exposed to very sheltered	
Tidal streams	Very weak; moderately strong (1 knot) in the Sound	
Tidal range	4.4 m (mean springs); 1.7 m (mean neaps) (Mellon Charles)	
Salinity	Marine	

## Introduction

Loch Ewe is a deep fjordic sealoch running roughly north-south between the major headlands of Rubha Reidh and Rubha Mór, 30 km due west of Ullapool. The loch is relatively wide with a maximum width of around 5 km and, apart from a few small drying rocks, has only one large island, the Isle of Ewe, in the north-east sector. Loch Thùrnaig is a very sheltered semi-enclosed area near the head of the loch. Loch Ewe lies within an area of Torridonian sandstone, partly along one of the major north-west to south-east fault lines of the western Highlands. Therefore most of the shores consist of heavily fissured and rough sandstone, apart from the south-western shore where the underlying Lewisian gneiss is exposed; this gives a harder and more rounded look to the rocky shores. Most of the northern half of the loch is relatively low-lying with the exception of the mouth area. The remainder of the loch is surrounded by hills.

Glaciation has resulted in a classic U-shaped structure to the loch, which has relatively steep sides and deep water nearly to the head. The loch is divided into two main basins with a sill at the entrance and a second sill running between the north-west of the Isle of Ewe, the nearby islet Sgeir an Araig and the west side of the loch at Mellangaun. About 50% of the shoreline is rocky, the rest consisting of sandy beaches or sand mixed with stones and boulders. Fine sand beaches are particularly well represented in Loch Ewe. Sublittoral rock extends to only around 15 m depth with the exception of one or two areas. The majority of the seabed consists of mud to the south of the second sill and muddy gravel and sand to the north. The loch faces north-north-west and gains very little protection from the Outer Hebrides. Much of the outer basin and the west side of the loch therefore experiences varying degrees of high wave exposure. The Isle of Ewe Sound and the head of the loch, including Loch Thùrnaig, are sheltered.

The loch supports a large population of wintering seabirds including the largest populations of black-throated divers *Gavia arctica* and great northern divers *G. immer* in north-west Scotland.

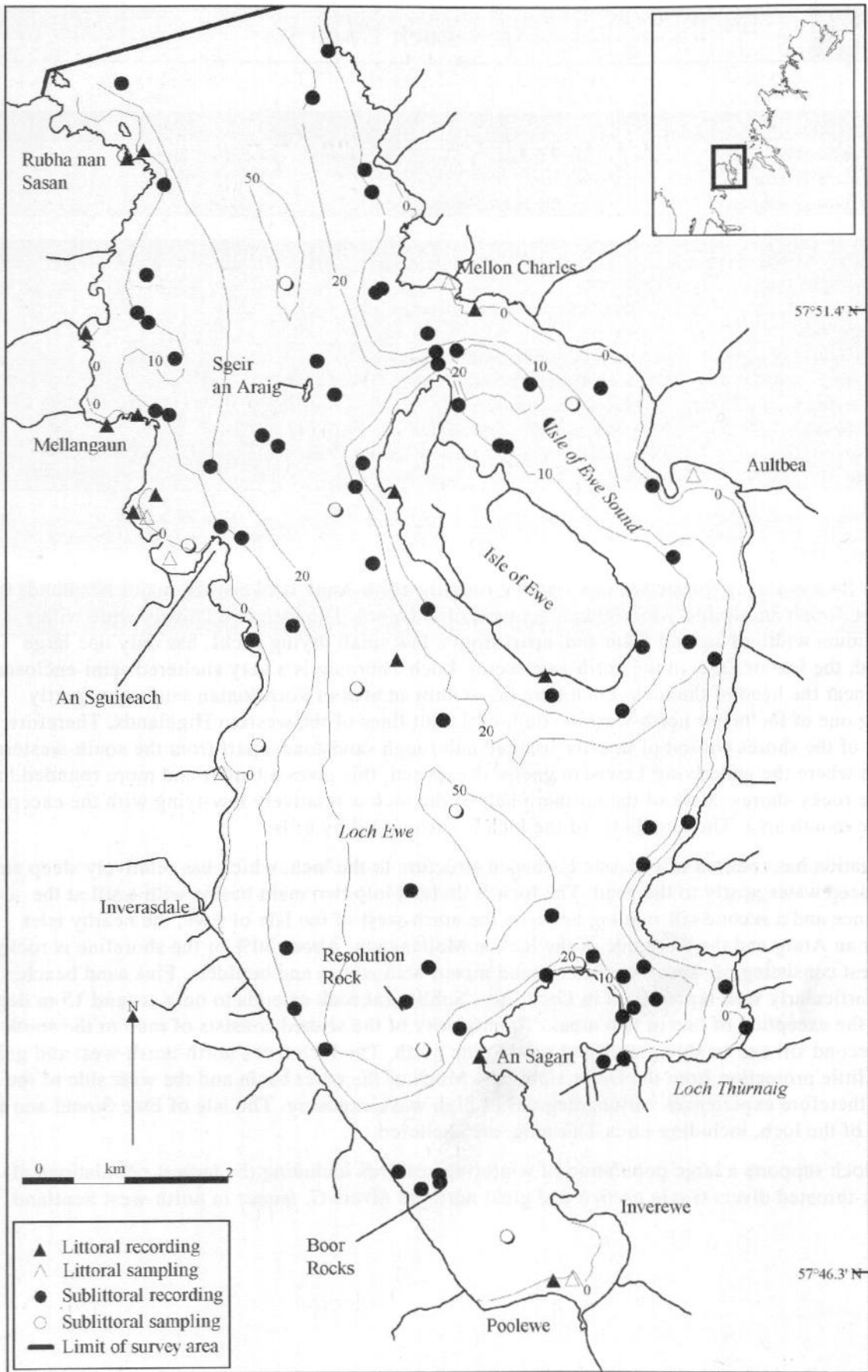


Figure 24.1 Main features of the area, showing sites surveyed.

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## Marine biology

Marine biological surveys				
	Survey methods	No. of sites	Date(s) of survey	Source
Littoral	Recording (epibiota)	6	June 1990	Howson (1991)
	Recording (epibiota)	3	August 1979	Powell <i>et al.</i> (1980)
	Recording (epibiota)	4	August 1978	Smith (1978)
	Infaunal sampling (cores)	5	Not stated	Eleftheriou & McIntyre (1976)
Sublittoral	Recording (epibiota)	35	June 1990	Howson (1991)
	Recording (epibiota)	38	September 1989	Gubbay (1990)
	Infaunal sampling (dredge)	5	June 1990	Howson (1991)
	Infaunal sampling (suction sampling)	6	June 1990	Howson (1991)

### Littoral

The shores around Loch Ewe are limited in extent, with typical intertidal widths of around 20–50 m, and consist primarily of bedrock with some boulders, mixed sand and rock, and clean sandy beaches. The latter are found mainly in the northern, more exposed part of the loch. Much of the western shore south of the peninsula of An Sguiteach consists of stony beaches alternating with sand, and the beach at Poolewe is of stones lying on coarse sand. The shores around the Isle of Ewe are mainly cobble, as are the eastern mainland shores opposite the island, but with some sand at Aultbea. The shores in Loch Thùrnaig are characterised by sloping, stepped bedrock grading into a predominantly muddy area.

#### Littoral rock

Rocky shores throughout Loch Ewe support communities characteristic of exposed to moderately exposed conditions, even on headlands near the head of the loch such as An Sagart. This is probably because many of the headlands consist of extremely steep rock. Also, many sites within the inner areas are still subject to a very long fetch down the loch and are thus more exposed than might be expected. The predominance of knotted wrack *Ascophyllum nodosum*, as seen in many of the sealochs in Sector 15, is therefore not apparent. Instead, rocky areas are dominated by bladder wrack *Fucus vesiculosus* in varying amounts, together with barnacles *Semibalanus balanoides* and limpets *Patella vulgata*. Sites exposed to considerable wave surge, such as the north-west side of the Isle of Ewe, are almost totally dominated by barnacles *S. balanoides* (BPat.Sem). More sheltered sites have a greater cover of *F. vesiculosus* on the mid-shore, often with a distinct band of barnacles above the fucoids which continues down the shore beneath the seaweed canopy (FvesB). Towards the exposed mouth of the loch, *F. vesiculosus* is often of the *linearis* form, interspersed with mussels *Mytilus edulis*. The lower shore bedrock at exposed sites has a rich flora of small red algae, a good cover of encrusting coralline algae (Fser.R; R) and, in the sublittoral fringe, the kelps *Alaria esculenta* and *Laminaria digitata* (Ala.Ldig). *Alaria* does not occur in the sublittoral fringe in more sheltered inner areas (Ldig.Ldig). Typical lichen-dominated supralittoral zones (YG) are present on bedrock all round the loch but are especially high and extensive at exposed sites near the mouth. On seabird cliffs at the northern end of the Isle of Ewe, the nitrophilous green alga *Prasiola stipitata* forms a wide band with the lichen *Verrucaria maura* (Pra).

#### Littoral sediments

Extensive beaches of fine sand are present on the west coast in bays at Mellangaun, Inverasdale and on the east coast at Mellon Charles and Aultbea. There are also other small sandy bays. These beaches are not exceptional but provide good examples of fine sand shores. The sand beaches slope gently down to low water and continue into the sublittoral. Aultbea and Inverasdale are sheltered, whilst the other shores mentioned are semi-exposed. The diversity and biomass of the infauna of these beaches increase with increasing shelter. The beaches support a typical sand

macrofauna with an 'Angulus community' extending up to around mid-tide level (AP.Pon). Conspicuous macrofauna are sparse and only the bivalve *Angulus tenuis* and polychaete worms such as *Nephtys* sp. are found by casual searching. However, over 60 small macrofaunal species have been recorded from these beaches (McIntyre & Eleftheriou 1968). The beach at Mellon Charles is faster draining than the others and mainly supports communities of polychaetes and amphipods. Sediment beaches in Loch Ewe are important for their long history of marine biological research where the macrofauna was recorded in detail in the 1960s as part of an extensive study of food chains for flatfish (McIntyre & Eleftheriou 1968). Studies of meiofauna, including nematodes, were also made over a period of ten years (McIntyre & Murison 1973). Seasonal cycles of organic matter, production and amphipod distribution have also been studied in detail on these beaches and in the sublittoral (Steele & Baird 1968; Robertson *et al.* 1989).

The shore at the head of the loch at Poolewe is a typical area of very mixed substrata, mainly small boulders, cobbles and pebbles with patches of coarse sand between. The sediment patches are colonised by numerous lugworms *Arenicola marina* and, near low water, the sand mason worm *Lanice conchilega*.

### Sublittoral

#### *Sublittoral rock*

The major part of the sublittoral in Loch Ewe consists of sediments, with rock restricted to near-shore areas apart from a few isolated rocky pinnacles and islets. Where the littoral consists of bedrock, this usually extends down into the shallow sublittoral to around 5–7 m depth, followed by a boulder slope to around 15 m depth. However, in common with many other similar sealochs, the depth of the rock/sediment boundary decreases with distance into the loch. Rock is present to at least 29 m depth at the loch entrance but reaches only 5 m depth at Boor Rocks near the head of the loch. There are two main exceptions to this: the sheltered Loch Thùrnaig, which is steep-sided and relatively deep and has boulders extending to around 23 m depth, and Resolution Rock in the centre of the inner part of the loch where bedrock extends to 27 m depth.

#### *Infralittoral rock*

The degree of exposure to wave action within Loch Ewe is reflected in the distribution of kelps. In the outer, exposed to moderately exposed entrance basin *Laminaria hyperborea* kelp forest predominates, extending as far south as the north-west of the Isle of Ewe. Most of the central area of the loch supports a mixed kelp forest of *L. hyperborea* and *L. saccharina*, whilst the very sheltered Loch Thùrnaig supports a forest of cape-form *L. saccharina*.

Dense *L. hyperborea* forest occurs in the entrance basin on bedrock and boulders to a depth of around 10 m. A distinct lower infralittoral zone with *L. hyperborea* park to around 15 m is also present in this outer area, wherever the rock extends this deep, mostly on boulders and cobbles interspersed by shell-gravel. At Firemare Bay there are some bedrock outcrops in the shallow sand-plains, and kelp forest here shows some signs of sand-scour. At most sites at the time of the early summer 1990 MNCR survey, there was a wide range of foliose and filamentous algae on the rock surfaces and kelp stipes. This also applies to the mixed kelp forests of the central area. This is in contrast to reports from other surveys done later in the year where intense grazing was apparent. This suggests that increasing grazing pressure and the disappearance of early, rapidly growing species may greatly reduce the underflora as the summer progresses. A similar phenomenon has been noted in Loch Gairloch (*Area summary* 23). In Loch Ewe some sites are intensely grazed early in the year and this was observed by the MNCR team at Rubha nan Sasan on the west coast and at the headland off Mellon Charles on the east coast. At grazed sites, undergrowth algae are reduced and robust species such as the barnacle *Balanus crenatus* and coralline crusts predominate under the kelp. Grazing pressure appears to be greater in the lower infralittoral, especially at the outermost sites.

Mixed kelp forests are characteristic of the moderately sheltered areas of the central basin south of the Isle of Ewe, and occur on bedrock and boulders. This type of forest is present, for example, on stepped bedrock at Resolution Rock, and near the entrance to Loch Thùrnaig to about 14 m depth. Depending on the substratum and exposure, both *L. hyperborea* and *L. saccharina* may occur in equal amounts or one may predominate over the other (LhypLsac). The rock surfaces tend to be silty but there are good growths of filamentous and foliose algae at some sites. Fauna tends to be sparse and encrusting species of both animals and algae are common.

#### *Circalittoral rock*

Circalittoral rock is relatively limited in extent within Loch Ewe. In the outer basin, at depths of around 25–30 m, there are areas of boulder, cobble and pebble plain overlying shelly sediments. These support communities of hydroids, ascidians and encrusting species. In places, such as at the western side of the mouth, there are beds of brittlestars *Ophiothrix fragilis* (Oph). Off the north side of Sgeir an Araig, the boulders and cobbles are rather bare, apart from encrusting species and the squat lobster *Munida rugosa* sheltering beneath the rocks (FaAIC). In the more sheltered central basin, boulders on mud and boulder tumbles are characterised by the brachiopod *Neocrania anomala* along with a variety of encrusting and semi-encrusting species and hydroids (AmenCio). Deep sheltered vertical bedrock, characteristic of the inner sheltered areas of fjordic lochs, is only present at Resolution Rock. Here, the fissured and ledged rock is very silty with coralline crusts beneath the silt, and numerous cup corals *Caryophyllia smithii*. Various hydroids and the ascidians *Clavelina lepadiformis*, *Ciona intestinalis* and *Ascidia mentula* are also common and there are a few silt-tolerant sponges such as *Polymastia mamillaris*.

#### *Sublittoral sediment*

A variety of sediments occur below the rock-sediment boundary, the grade depending on the degree of shelter afforded by depth and geographical position. Fine sand extends up into the littoral zone adjacent to the sandy bays described above. More extensive areas of mud are present in Loch Ewe than in the nearby and similarly shaped Loch Gairloch (*Area summary* 23). The majority of the seabed in deep water south of the sill at Sgeir an Araig and into Loch Thùrnaig consists of soft mud. North of the sill, there is some mud in the deep areas but much of the seabed is muddy gravel and sand. Sand and gravel occur inshore along the entire west coast of the loch, grading into sandy mud deeper than about 10 m. The sheltered sound east of the Isle of Ewe is flooded mainly by muddy gravel rather than sand. Sand in areas of increased water movement, such as the sill at the northern entrance to this sound, has a high proportion of shell debris. The embayment at Poolewe supports a bed of maerl *Phymatolithon calcareum* on sandy mud (see below).

Deep soft muds floor the inner basin of Loch Ewe south of the Isle of Ewe. Areas within diving depths appear well-worked, giving the impression of a lunar landscape with mounds and burrows of crustaceans and polychaete worms but few visible epifauna. The Norway lobster *Nephrops norvegicus* is responsible for many of the burrows (SpMeg). The burrowing brittlestar *Amphiura filiformis* is also common along with scattered anemones *Cerianthus lloydii* and sea-pens *Pennatula phosphorea*. Mud sampled by dredging at greater depths is dominated by polychaetes, especially cirratulids, and the brittlestars *Amphiura chiajei* and *A. filiformis*. This soft mud grades into a firmer and sandier mud in shallower water around the edges of the inner part of the loch. This type of sediment also predominates in the more exposed areas to the west of the Isle of Ewe. The sediment here is characterised by much larger numbers of sea-pens, especially *P. phosphorea*, with smaller numbers of *Virgularia mirabilis* and much smaller numbers of *N. norvegicus*. The turret shell *Turritella communis*, brittlestars *Ophiura* spp. and *Cerianthus lloydii* are present in variable abundances (SpMeg; VirOph).

In some areas, these firmer sandy and gravelly muds have large amounts of cobbles, pebbles and empty shells overlying them. Plains of this type occur in particular along the sill to the west of Sgeir an Araig and across the northern entrance to the Isle of Ewe Sound, at depths of around

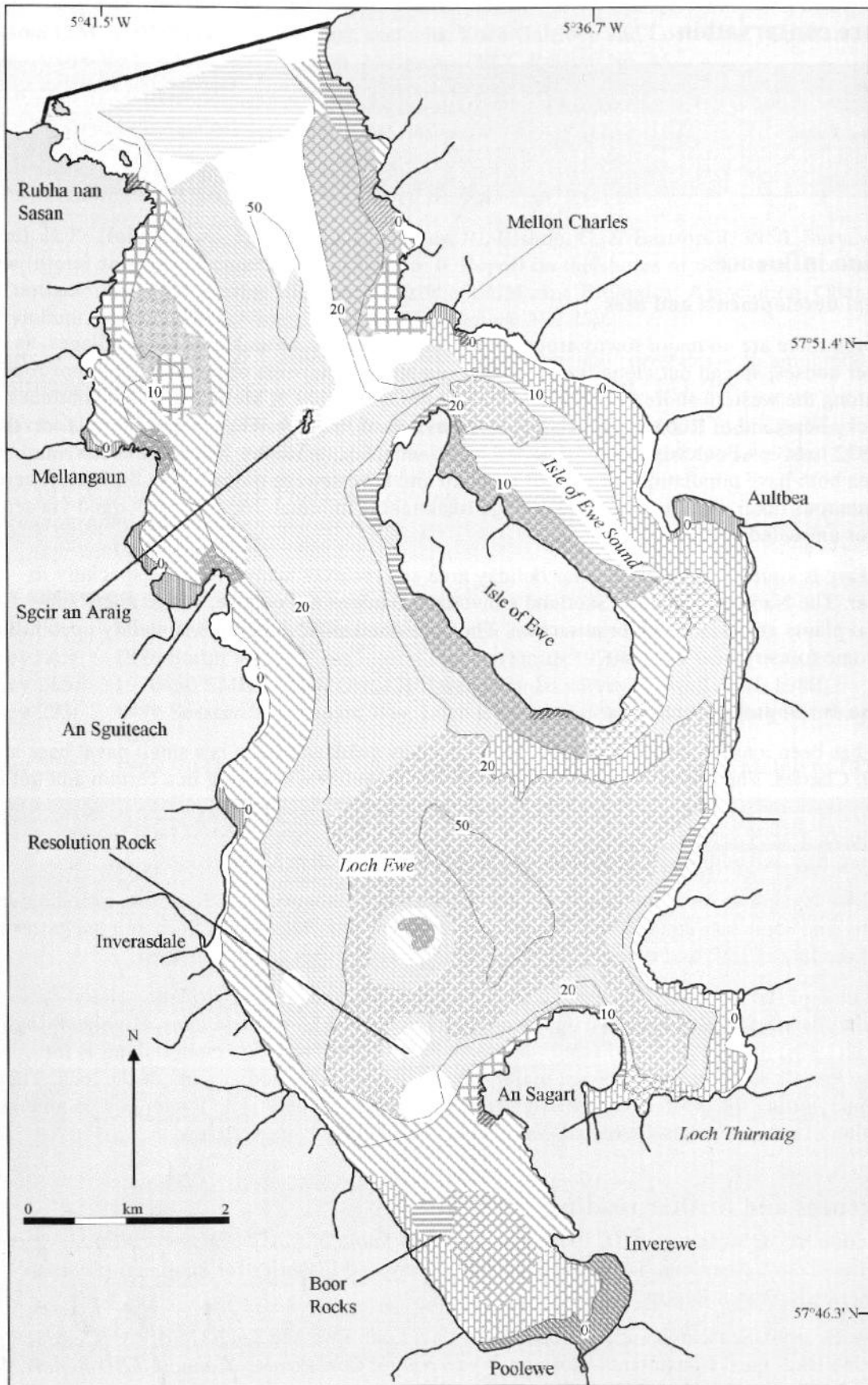
20–30 m. Here there is a slightly increased tidal flow and this, together with the availability of attachment sites, encourages the growth of numerous hydroids, bryozoans and ascidians (VirOph.HAs). Brittlestars *Ophiura* spp. are common on the sediment surface, whilst sea-pens are sparsely distributed. Similar areas are present along the south-east coast either side of Loch Thùrnaig entrance and also around Resolution Rock.

Shallow infralittoral mixed sediments at around 5–10 m depth are found in sheltered parts of the loch where the rock slope is reduced in extent. Much of the sediment in the sound behind the Isle of Ewe falls into this category, as well as areas within Loch Thùrnaig and behind Boor Rocks. The sediment cover is predominantly algal and, in particular, loose-lying mats of the filamentous red alga *Trailiella* are common, often covering large areas. Other filamentous brown and red algae, including ectocarpoids, are common at some sites, and scattered larger algae including *L. saccharina*, *Chorda filum* and *Desmarestia viridis* are found attached to stones and shells. Within the sediment, bivalves, especially *Modiolus modiolus*, are frequently present along with polychaete worms and burrowing holothurians (Tra; Lsac.X). At Boor Rocks the *Trailiella* mat extends out over the adjacent maerl bed (see below). In the northern part of the sound, patchy *Trailiella* extends down to 12–15 m depth with larger numbers of *Modiolus* and associated ascidians *Ascidiella aspersa*. At the southern end in similar depths, the red alga *Phyllophora crispa* forms the main cover over sediment and pebbles.

As might be expected, the coarsest sediments, consisting of shell-gravels, sand and fine sand, are found in the outer parts of Loch Ewe in the entrance basin. Infralittoral sands also extend along most of the west coast. In the shallows, at around 0–8 m depth, sometimes deeper at exposed sites, there are extensive plains of fine sand and slightly muddy sand in the loch entrance, extending south along the western shore and also along the south-east of the Isle of Ewe. These sands grade into those of the littoral in sandy bays such as Firemare. Algae are sparse due to a lack of hard substrata for attachment. The fauna is characterised by burrowing species, especially the heart urchin *Echinocardium cordatum*, the holothurian *Labidoplax digitata*, razor clams *Ensis* spp. and lugworms *Arenicola marina* (EcorEns). Mobile epifauna include brittlestars *Ophiura* spp. and various starfish and crabs.

Around the edges of the outer basin, coarse mobile infralittoral shell-gravel and sand-plains are present between about 10 m and 15 m depth. This sediment is thrown up into waves at the more exposed sites. Unlike the fine infralittoral sands, numerous pebbles and shells provide attachment for a fairly wide variety of algae, including *L. saccharina*, *D. viridis* and *Desmarestia aculeata*. Smaller foliose and filamentous species include several that are characteristic of mobile substrata, such as *Scinaia turgida*, *Phyllophora crispa* and *Gracilaria verrucosa*. The fauna is characterised by the holothurian *Neopentadactyla mixta*, the bivalves *Ensis arcuatus* and *Pecten maximus*, brittlestars *Ophiura albida* and the topshell *Gibbula magus* (Phy). Coarse shelly sand thrown up into waves continues into the circalittoral to at least 20 m depth and is present along the east side of the loch as far south as the peninsula off Mellon Charles (Ven.Neo).

An extensive bed of maerl *P. calcareum* covers the shallow water area between Boor Rocks and Poolewe at the head of the loch. Most of the maerl is live in a layer up to 12 cm deep, bound together by *Trailiella*, and overlying mud and muddy sand. Towards the Poolewe end of the bed, the file shell *Limaria hians* is common, its byssal threads further helping to bind the maerl. At least during the spring and early summer, parts of the bed are covered in a blanket of filamentous brown ectocarpoid algae and scattered kelp *L. saccharina*. Maerl is also present in small amounts around Resolution Rock, lying in pockets on sediment covered bedrock at around 8–15 m depth.



**Figure 24.2** Indicative distribution of the main biotopes in the area (based on data from survey sites shown in Figure 24.1, cited literature and additional field observations).

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## Nature conservation

Conservation sites		
Site name	Status	Main features
Inverewe Garden	NTS	Garden and adjacent coast and woodland
Aultbea	MoD	Rock/shingle/sand
Wester Ross	NSA	Landscape

## Human influences

### Coastal developments and uses

Although there are no major towns around Loch Ewe, there are a number of large villages, as well as other houses, spread out along the roads that run along either side of the loch. A minor road runs along the western shore to the beautiful, fine sandy beaches at Mellongaun and continues to the rocky headland of Rubha nan Sasan near the mouth of the loch. The eastern shore is served by the A832 between Poolewe and Aultbea and by minor roads to Mellon Charles. Poolewe and Aultbea both have populations of several hundred and have sewage outfalls into the loch. There are numerous other small outfalls and sewage treatment is minimal. Most is discharged via septic tanks or untreated outfalls.

Loch Ewe is situated within a popular holiday area and receives many visitors, especially in summer. The National Trust for Scotland's Inverewe Gardens at Poolewe, where many sub-tropical plants grow, are a major attraction. The hinterland around the loch is mainly open hills, with some forestry near Poolewe.

### Marine developments and uses

There has been a naval presence in Loch Ewe for many years and there is a small naval base at Mellon Charles. There is also a naval refuelling jetty at Aultbea, resulting in a certain amount of military boat traffic. The loch has a long history of marine biological research by the Department of Agriculture and Fisheries for Scotland (now Fisheries Research Services) field laboratory at Firemore Bay and additional facilities at the naval base in Mellon Charles.

Loch Ewe is popular for water sports, with a considerable amount of wind-surfing, canoeing and yachting and some sub-aqua diving. There are permanent moorings off Aultbea and the eastern side of the Isle of Ewe and a number of public and private jetties around the loch.

At the time of the 1990 MNCR survey, leases had been granted for four Atlantic salmon farms and three shellfish facilities, and active operations were noted at four of these sites. Highland Regional Council (1988) prepared a Fish Farm Framework Plan for the loch. The main fishing is for Norway lobster *Nephrops norvegicus*, mainly by creeling in the muddier parts of the loch. There is also some potting for lobsters *Homarus gammarus* and crabs. There is no longer any commercial collection of native oysters *Ostrea edulis* because their numbers are very low.

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- Survey 265: 1970–80 SMBA/MBA Great Britain intertidal survey (Powell *et al.* 1980).
- Survey 283: 1989 Seasearch: Gruinard Bay, Loch Ewe and Loch Gairloch survey (Gubbay 1990).
- Survey 326: 1965–70 DAFS Scottish littoral sediment survey (Eleftheriou & McIntyre 1976).

Littoral sites					
Survey	Site	Place	Grid reference	Latitude/longitude	Biotores recorded
30	51	S of An Sagart, Loch Ewe	NG 848 834	57°47.3'N 05°37.2'W	YG; Ver.Ver; FvesB; Fspi; Fser.R; PelB
30	52	Shore at Londubh, Poolewe, Loch Ewe	NG 855 812	57°46.1'N 05°36.4'W	FvesX; Lan; Fscrr.VS
30	62	Shore W Gualann Mhór, Loch Ewe	NG 854 871	57°49.3'N 05°36.7'W	YG; Ver.Ver; Fves; Fspi; Fser.Fser; Ldig.Ldig; Pel
30	69	Shore E of Sgeir Ghlas, Loch Ewe	NG 847 907	57°51.2'N 05°37.6'W	YG; Ver.Ver; Fves; Fspi; Fser.Fser; Ldig.Ldig; Fser.Fser.Bo; Pel; BPat.Sem
30	73	Shore at Camas Beithe, Isle of Ewe, Loch Ewe	NG 839 889	57°50.2'N 05°38.3'W	Cor; Pra; FvesB; XR; BPat.Cht; BPat.Sem
30	79	Shore at Gaimeamh Smo, Loch Ewe	NG 814 887	57°50.1'N 05°40.9'W	AP.Pon
86	7	Loch Thùrnaig, Loch Ewe, Wester Ross	NG 840 873	57°49.3'N 05°38.2'W	SLR
86	8	Firemore Bay, Loch Ewe, Wester Ross	NG 816 889	57°50.2'N 05°40.7'W	AP.Pon
86	9	Cove, Loch Ewe, Wester Ross	NG 810 905	57°51.0'N 05°41.4'W	F; Pol
86	10	Rubha nan Sasan, Loch Ewe, Wester Ross	NG 815 922	57°52.0'N 05°41.0'W	ELR
265	58	Camas Allt Eoin Thomais, Loch Ewe	NG 812 896	57°50.5'N 05°41.2'W	MLR; Rho
265	104	Rubha nan Sasan, Loch Ewe	NG 814 922	57°51.9'N 05°41.1'W	MLR; Ala
265	114	Sròn Meallan a' Ghàmhna, Loch Ewe	NG 815 897	57°50.6'N 05°40.9'W	Rkp; ELR

<b>Littoral sites</b>					
Survey	Site	Place	Grid reference	Latitude/longitude	Biotores recorded
326	8	Mellon Charles, Loch Ewe	NG 845 910	57°51.4'N 05°37.9'W	AP.P; AP.Pon; AEur; BarSnd
326	9	Aultbea, Loch Ewe	NG 869 891	57°50.4'N 05°35.4'W	AP.Pon; PCer
326	10	Inverasdale, Loch Ewe	NG 823 862	57°48.7'N 05°39.9'W	AP.Pon; BarSnd
326	11	S Firemore Bay, Loch Ewe	NG 818 883	57°49.8'N 05°40.5'W	AP.P; AP.Pon; AEur; BarSnd
326	12	N Firemore Bay, Loch Ewe	NG 814 887	57°50.0'N 05°40.9'W	AP.P; AP.Pon; AEur; BarSnd

<b>Sublittoral sites</b>					
Survey	Site	Place	Grid reference	Latitude/longitude	Biotores recorded
30	46	Inner Loch Thùrnaig, Loch Ewe	NG 860 833	57°47.3'N 05°36.0'W	LsacX
30	47	W side of Loch Thùrnaig, Loch Ewe	NG 861 838	57°47.5'N 05°35.8'W	AmenCio; FaSwV; Lsac.Ft; Lsac.Pk
30	48	Central Loch Thùrnaig, Loch Ewe	NG 865 839	57°47.6'N 05°35.5'W	SpMeg
30	49	SW side of entrance to Loch Thùrnaig, Loch Ewe	NG 857 843	57°47.8'N 05°36.3'W	VirOph
30	50	Rubha' Ard na Bà, Loch Ewe	NG 854 842	57°47.7'N 05°36.6'W	VirOph; Ldig.Ldig; LhypGz.Ft; LhypGz.Pk
30	53	Offshore Poolewe, Loch Ewe	NG 850 816	57°46.3'N 05°36.8'W	Lcor
30	54	W of Boor Rocks, Loch Ewe	NG 842 821	57°46.6'N 05°37.7'W	Tra
30	55	NE Boor Rocks, Loch Ewe	NG 843 822	57°46.7'N 05°37.6'W	Lcor; LhypLsac.Ft
30	56	NW An Sagart, Loch Ewe	NG 840 839	57°47.6'N 05°38.0'W	SpMeg; AntAsH
30	57	SE of Midtown, Loch Ewe	NG 829 844	57°47.8'N 05°39.2'W	VirOph.HAs; AmenCio.Met
30	58	Offshore, N of Rubha Thùrnaig, Loch Ewe	NG 864 856	57°48.5'N 05°35.7'W	SpMeg
30	59	SW of Sidhean Corrach, Loch Ewe	NG 869 857	57°48.6'N 05°35.2'W	AmenCio; LhypLsac.Ft; LsacX
30	60	SW of Isle of Ewe, Loch Ewe	NG 845 882	57°49.9'N 05°37.7'W	VirOph; FaAlC
30	61	SW Gualann Mhór, Isle of Ewe, Loch Ewe	NG 855 869	57°49.2'N 05°36.7'W	EcorEns; Tra
30	63	E end of Isle of Ewe, Loch Ewe	NG 864 874	57°49.5'N 05°35.8'W	Lsac.Ldig; EcorEns
30	64	W of NATO jetty, Loch Ewe	NG 868 874	57°49.5'N 05°35.4'W	VirOph.HAs
30	65	SW of Aird Point, Loch Ewe	NG 862 886	57°50.2'N 05°36.1'W	ModHo
30	66	NE Aird Fraoch, Loch Ewe	NG 850 893	57°50.5'N 05°37.3'W	LsacX
30	67	The Sound (centre), Loch Ewe	NG 857 897	57°50.7'N 05°36.6'W	VirOph
30	68	S of Oitis Ormiskaig, Loch Ewe	NG 859 899	57°50.8'N 05°36.4'W	Tra
30	70	N of Gob na Lice, Isle of Ewe, Loch Ewe	NG 845 903	57°51.0'N 05°37.8'W	VirOph.HAs
30	71	N entrance to Sound, Loch Ewe	NG 843 903	57°51.0'N 05°38.0'W	VirOph.HAs
30	72	Sgeir a' Bhuic, Loch Ewe	NG 836 892	57°50.4'N 05°38.7'W	LsacX; Sac; XKScrR
30	74	S of Camas Beithe, Loch Ewe	NG 837 882	57°49.9'N 05°38.5'W	SpMeg
30	75	E Inverasdale, Loch Ewe	NG 826 864	57°48.9'N 05°39.5'W	EcorEns
30	76	E of An Fhaighear Bheag, Loch Ewe	NG 829 876	57°49.5'N 05°39.3'W	LsacX
30	77	Near Camas na Muic, Loch Ewe	NG 820 884	57°49.9'N 05°40.3'W	EcorEns
30	78	An Sguiteach, Loch Ewe	NG 823 886	57°50.0'N 05°40.0'W	Lhyp.Ft; EcorEns
30	80	SW of Sgeir an Araig, Loch Ewe	NG 828 894	57°50.4'N 05°39.5'W	VirOph.HAs
30	81	Sròn Meallan a' Ghàmhna, Loch Ewe	NG 816 897	57°50.6'N 05°40.7'W	XKScrR
30	82	SE Sròn nan Oban, Loch Ewe	NG 818 902	57°50.9'N 05°40.5'W	FaS; XKScrR
30	83	N Sgeir an Araig, Loch Ewe	NG 832 902	57°50.9'N 05°39.2'W	FaAlC; VirOph.HAs; Sac
30	84	Eilean Rubh' a' Choin, Loch Ewe	NG 838 909	57°51.3'N 05°38.6'W	FoR; IGS; Ala.Ldig; LhypGz.Ft
30	85	SE Sgeir an Eich, Loch Ewe	NG 815 910	57°51.3'N 05°40.9'W	Ven.Neo
30	86	Off Sgeir an Eich, Loch Ewe	NG 814 922	57°51.9'N 05°41.1'W	EcorEns
30	87	Rubha nan Sasan, Loch Ewe	NG 817 919	57°51.8'N 05°40.7'W	SedK; LhypGz.Ft



Sublittoral sites					
Survey	Site	Place	Grid reference	Latitude/longitude	Biotopes recorded
30	88	Ploc Leacan Donna, Loch Ewe	NG 837 918	57°51.8'N 05°38.7'W	EphR
30	89	Headland near Geodh a'Bhodaich, Loch Ewe	NG 833 932	57°52.5'N 05°39.2'W	Lhyp.Ft; EcorEns
30	90	N of Sgeir Maol Mhoraidh Shuas, Loch Ewe	NG 813 929	57°52.3'N 05°41.2'W	Oph
30	91	NW Sgeir Maol Mhoraidh, Loch Ewe	NG 806 933	57°52.5'N 05°42.0'W	LhypGz.Pk
30	92	Resolution Rock, Loch Ewe	NG 841 850	57°48.1'N 05°38.0'W	VirOph.HAs; LhypLsac.Ft; Phy
30	93	SW of Warburg Rock, Loch Ewe	NG 842 834	57°47.3'N 05°37.7'W	VirOph
30	94	E Resolution Rock, Loch Ewe	NG 846 858	57°48.6'N 05°37.5'W	SpMeg
30	95	End of Fisher Point, Loch Ewe	NG 836 870	57°49.2'N 05°38.6'W	VirOph
30	96	W of Sgeir a Bhuic, Loch Ewe	NG 834 887	57°50.1'N 05°38.9'W	VirOph
30	97	W of Rubh' a'Choin, Loch Ewe	NG 829 909	57°51.3'N 05°39.5'W	VirOph.HAs
283	53	W by Boor Rocks, Loch Ewe	NG 840 823	57°46.7'N 05°37.9'W	Tra
283	54	Boor Rocks, Loch Ewe	NG 844 822	57°46.6'N 05°37.5'W	Mrl; FaMx; LsacX; Tra
283	55	Off Naast Jetty, Loch Ewe	NG 830 839	57°47.5'N 05°39.0'W	FaMx; LsacX; Tra
283	56	Off Sròn nan Oban, Loch Ewe	NG 816 906	57°51.1'N 05°40.8'W	IGS; EphR; Lhyp
283	57	Sròn nan Oban reef, Loch Ewe	NG 815 907	57°51.1'N 05°40.9'W	Phy.HEc; LhypGz
283	58	Sròn Meallan a Shambna, Loch Ewe	NG 818 897	57°50.6'N 05°40.6'W	EphR; XKScrR; Lhyp
283	59	Off Midtown School, Loch Ewe	NG 826 875	57°49.4'N 05°39.6'W	SpMeg; VirOph.HAs
283	60	Channel an Squiteach, Loch Ewe	NG 833 835	57°47.3'N 05°38.7'W	SpMeg; VIROph.HAs
283	61	An Squiteach Point, Loch Ewe	NG 825 885	57°50.0'N 05°39.8'W	Phy.HEc; FaMx; LsacX; Tra
283	62	Camas na Muil Bay, Loch Ewe	NG 822 892	57°50.3'N 05°40.1'W	Phy.HEc
283	63	Sitheanan Dubha Bay, Loch Ewe	NG 846 898	57°50.7'N 05°37.7'W	SpMeg; VirOph.HAs; IGS; XKScrR
283	64	Gob na Lice, Loch Ewe	NG 844 902	57°50.9'N 05°38.0'W	IGS; XKScrR; Lhyp
283	65	Sgeir an Araig, Loch Ewe	NG 834 899	57°50.7'N 05°39.0'W	XKScrR; Lhyp; Lsac
283	66	Loch Thùrnaig Jetty, south, Loch Ewe	NG 874 837	57°47.5'N 05°34.6'W	Aasp
283	67	N of Leach Bhudhe, Loch Ewe	NG 872 841	57°47.7'N 05°34.8'W	Aasp
283	68	W side of Loch Thùrnaig, Loch Ewe	NG 863 839	57°47.6'N 05°35.7'W	Aasp
283	69	Ob na ba Rudidhe, Loch Ewe	NG 862 834	57°47.3'N 05°35.8'W	Pcri; Beg
283	70	Loch Thùrnaig narrows, Loch Ewe	NG 864 843	57°47.8'N 05°35.6'W	VirOph
283	71	N of Ploc an Rubha, Loch Thùrnaig, Loch Ewe	NG 862 842	57°47.7'N 05°35.8'W	SpMeg; VirOph.HAs; LhypLsac
283	72	Rubha' Ard na Bà, Loch Ewe	NG 859 844	57°47.8'N 05°36.1'W	Aasp; SpMeg; VirOph.HAs; LhypLsac; SCR; Lsac
283	73	NATO oil depot jetty, Loch Ewe	NG 871 873	57°49.4'N 05°35.1'W	Aasp; FaMx; LsacX; Tra
283	74	N of Rubha Thùrnaig, Loch Ewe	NG 864 853	57°48.3'N 05°35.7'W	Aasp; FaMx; LsacX; SCR; CMU; Tra
283	75	Off An Sagart Point, Loch Ewe	NG 846 837	57°47.4'N 05°37.4'W	SpMeg, VirOph.HAs; LsacX; EcorEns
283	76	Resolution Rock, Loch Ewe	NG 843 843	57°47.7'N 05°37.8'W	FaMx; LsacX; Lsac; Tra
283	77	N of Rubha' Ard na Bà, Loch Ewe	NG 855 848	57°48.0'N 05°36.6'W	SpMeg; VirOph.HAs
283	78	S point of Isle of Ewe, Loch Ewe	NG 862 868	57°49.1'N 05°36.0'W	Pcri
283	79	W coast of Isle of Ewe, Loch Ewe	NG 843 878	57°49.6'N 05°37.9'W	Mrl; Tra
283	80	S of Sgeir a Bhuic, Loch Ewe	NG 836 890	57°50.3'N 05°38.7'W	SpMeg; VirOph.HAs
283	81	S of Aird Point, Loch Ewe	NG 867 883	57°50.0'N 05°35.6'W	Pcri
283	82	Aultbea slip, Loch Ewe	NG 865 890	57°50.3'N 05°35.8'W	FaMx; LsacX; Tra
283	83	Gob na Lice/Rubh' a'Choin, Loch Ewe	NG 843 905	57°51.1'N 05°38.1'W	SpMeg; VirOph.HAs; IGS
283	84	E of Fairway Buoy, Loch Ewe	NG 832 928	57°52.3'N 05°39.3'W	PomByC
283	86	Rubh' a'Choin, Loch Ewe	NG 838 909	57°51.3'N 05°38.6'W	IGS
283	87	W of Sgeir an Araig, Loch Ewe	NG 827 895	57°50.5'N 05°39.6'W	SCR

<b>Sublittoral sites</b>					
<i>Survey</i>	<i>Site</i>	<i>Place</i>	<i>Grid reference</i>	<i>Latitude/longitude</i>	<i>Biotopes recorded</i>
283	88	SE of Sitheanan Dubha, Loch Ewe	NG 850 894	57°50.5'N 05°37.3'W	ModHAs; Tra
283	89	Al buoy, SW of Ormiskaig, Loch Ewe	NG 853 900	57°50.8'N 05°37.1'W	SpMeg
283	90	Stithean Dubha/Culconich, Loch Ewe	NG 855 896	57°50.6'N 05°36.8'W	ModHAs