A geological excursion guide to Rum: the Paleocene igneous rocks of the Isle of Rum

Front cover

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Map extracts used as bases for (Figure 6), (Figure 26), (Figure 33), (Figure 44), (Figure 51), (Figure 58), (Figure 62), (Figure 71) are reproduced with the permission of Scottish Natural Heritage, © SNH.

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Acknowledgements

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Introduction

The Isle of Rum is the largest of the Small Isles in the Inner Hebrides, north-west Scotland (Figure 1). It is a National Nature Reserve, owned and managed by Scottish Natural Heritage (SNH)* and there are several geological Sites of Special Scientific Interest (Emeleus and Gyopari, 1992). In addition to the spectacular geology, the island is noted for its herd of red deer (the subject of a long-term study initated in the 1950s), feral goats, plant life, birds (Rum was used as the base for the reintroduction of the Sea Eagle to the Hebrides), and insects. Rum has a population of about 20, the majority of whom live at Kinloch.

Visitors to Rum can usually freely explore the immediate surroundings of Kinloch, where there are several well-marked nature trails. At certain times during the year there are restrictions on access to parts of the island, especially the northern area around Kilmory which is the centre for ongoing deer studies. Notification of these activities is usually given on the information boards outside the White House. Those walking or working outwith Kinloch should always fill in daily route cards (available outside the White House) and make sure that these are completed on return. Leaders of parties visiting the island must contact the Reserve Manager well in advance of their intended visit; geologists should note that rock sampling can only be carried out with the Reserve Manager's permission. Collecting from loose material is usually not a problem but hammering exposures is not generally permitted.

Rum and the other Small Isles (Eigg, Canna, and Muck) are served by ferry (foot passengers only) from Mallaig, which is connected by road and railway to Fort William (70 km) and Glasgow (240 km), and by road to Inverness (180 km). The nearest airports are at Glasgow and Inverness. There is also a regular vehicle ferry connection (*c*. 40 minutes) between Mallaig and Armadale on the Isle of Skye.

*SNH, The White House, Kinloch, Isle of Rum, PH43 4RR; Tel. 01687–46–2026; www.snh.org.uk

Fieldwork on Rum generally involves cross-country walking over rough, damp ground and climbing to between 500–800 m elevation. Rain and strong winds are common. It is therefore essential to have good walking boots and adequate waterproof clothing. There is no public transport and all vehicles on the island are for the use of SNH employees. There are no paved roads, only rough tracks and paths.

The island is well known for the ferocity of its midges, which can be very trying on still, humid days. Visitors should bring their preferred repellant and midge nets, for these may not be available on the island. Ticks occur in the areas frequented by deer and goats. The best protection against both of these is provided by long trousers and long-sleeved shirts. There are no snakes on Rum.

A selection of maps and books relating to Rum is listed below. Topographic maps can be obtained through most booksellers or from Edward Stanford Ltd, 12–14 Long Acre, London, WC2E 9LP (www.stanfords.co.uk). SNH publications are available from the Publications Section, Scottish Natural Heritage, Battleby, Redgorton, Perth, PH1 3EW (www.snh.org.uk) and some may be bought from the SNH office on Rum. The SNH 1:20,000 geological map is only obtainable from SNH on Rum. Publications (maps, memoirs, etc.) of the British Geological Survey (www.bgs.ac.uk) can be purchased from: BGS, Murchison House, West Mains Road, Edinburgh, EH9 3LE; BGS Keyworth, Nottingham, NG12 5GG; The Natural History Museum, Earth Sciences Galleries, South Kensington, London; or through approved stockists. (NB: BGS publications required for educational purposes and ordered through an educational establishment may attract a discount.)

Maps

Visitors to Rum should bring a copy of the Ordnance Survey 1:25,000 map and use this at all times when in the field.

Ordnance Survey topographic maps:

1:50,000 Landranger series: Sheet 33, *Rum and Eigg*

1:25,000 Explorer series: Sheet 397,

Rum, Eigg, Muck, Canna and Sanday

Geological maps

1:50,000 British Geological Survey Scotland Sheet 60, *Rum*(Solid & Drift) (1994)

1:20,000 Scottish Natural Heritage, *Rum — Solid Geology*

(Second Edition, 1992) (obtainable only from SNH on Rum)

Selected books, etc.

GOODENOUGH, K. and BRADWELL, T. (2004): *Rum and the Small Isles: A Landscape fashioned by Geology*(Redgorton, Perth: Scottish Natural Heritage).

BELL, B. R. and WILLIAMSON, I. T. (2002): 'Chapter 14: Tertiary igneous activity', in TREWIN, N. H. (editor): *The Geology of Scotland*(London: The Geological Society).

EMELEUS, C. H. (1997): 'Geology of Rum and the adjacent islands', *Memoir of the British Geological Survey*, sheet 60 (Scotland) (Nottingham: British Geological Survey).

EMELEUS, C. H. and BELL, B. R. (2005): *British regional geology: the Palaeogene volcanic districts of Scotland*(fourth edition) (Nottingham: British Geological Survey).

UPTON, B. G. J. (2004): *Volcanoes and the Making of Scotland*(Edinburgh: Dunedin Academic Press).

Travel

Caledonian MacBrayne operates a service from Mallaig to Rum and the other Small Isles. Details about the current timetable and fares should be obtained from Caledonian MacBrayne (Mallaig 01687–46–2403; or see the company's website, www.calmac.co.uk). For train connections between Mallaig, Fort William and Glasgow, consult the National Rail Timetable or First Scotrail ([http://www.firstgroup.com/scotrail) www.firstgroup.com/scotrail).] Buses operate between Mallaig and Fort William (Shiel Buses, Acharacle, Argyll, PH36 4JY; shiel.buses@virgin.net). As ferry departures from Mallaig are generally earlier than the arrival of trains (except on Saturdays during the summer), it is necessary to stay in Mallaig overnight. Hotel, B&B and other accommodation is available but should be booked in advance. A summer ferry service also operates between Arisaig and Rum on certain days; for details contact Arisaig Marine (tel. 01687–465224; www.greentourism.org.uk/ ArisaigMarine). Private vehicles (cars, motorcycles, etc.) are not permitted on the island and the SNH office on Rum should be consulted about the use of mountain bikes prior to arrival.

NB: Ferry sailings can be delayed or cancelled when there are adverse weather conditions. This rarely happens during the summer and delays are less frequent since the completion of the new slipways on Rum and the other islands.

Accommodation

Accommodation (self-catering/individual meals/full board) is currently available at Kinloch Castle hostel (contact: The Manager, Kinloch Castle, Isle of Rum, PH43 4RR, Tel. 01687–46–2037). Camping is allowed at Kinloch; elsewhere camping is strictly controlled and may only be arranged with the permission of the Reserve Manager. Bothies maintained by the Scottish Mountain Bothies Association are located at Dibidil [NM 393 927] and Guirdil [NG 320 013]; the Reserve Manager should be consulted if it is intended to use these.

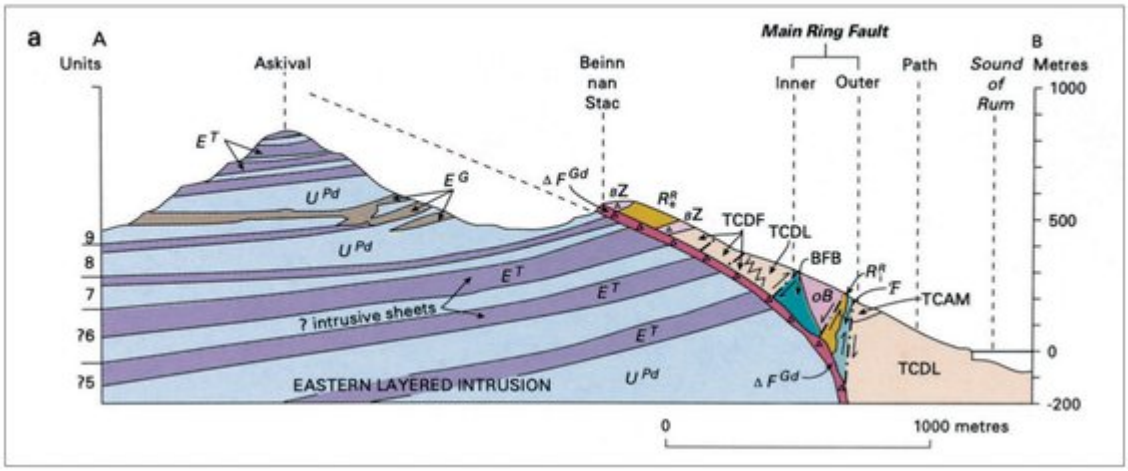
A small licensed shop and post office next to the community hall [NM 403 997] at Kinloch sells a selection of groceries and beverages. Opening hours are from about 17.00–19.00. A limited selection of postcards may be available and postcards may also be on sale in the castle, along with Scottish Natural Heritage literature about Rum. A comprehensive selection of SNH publications about Rum is obtainable from the Reserve Office which is open on mornings, Monday–Friday. There is a public telephone near the old post office [NM 403 996] and in the castle courtyard. At present, mobile phone reception is possible on parts of the east side of the island, but is poor to non-existent elsewhere.

Items needed for the bothies

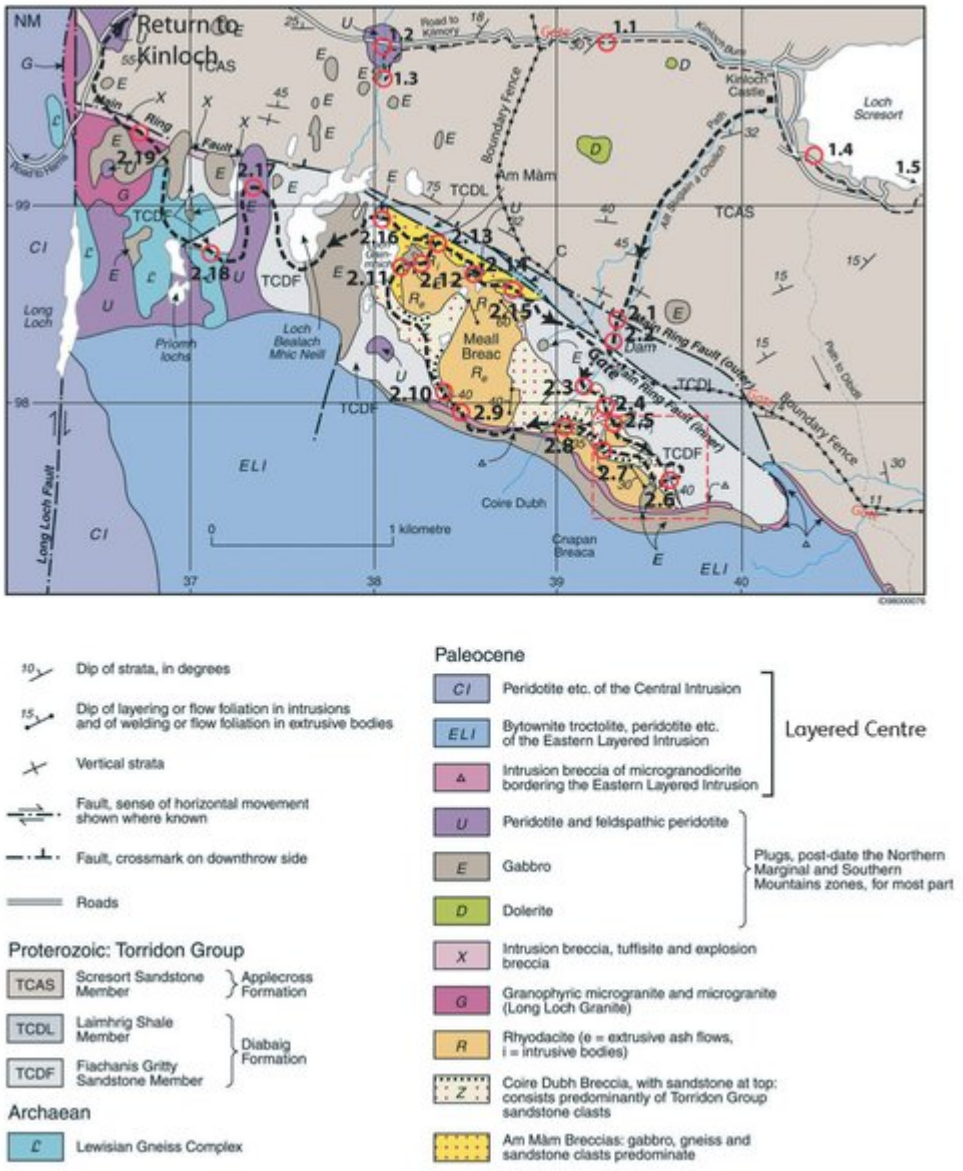
The bothy accommodation is spartan. There are two rooms, each of which has a fireplace, a table, and some benches. There is no plumbing and at Dibidil there is no nearby source of fuel (driftwood or otherwise). If you wish to light a fire in this bothy, bring a supply of fuel (kindling, firewood, coal, firelighters, matches, etc.). Sleeping bags, cooking utensils, a lightweight stove, all food, and candles/torches will be required. Mobile phone signal is generally good in the Dibidil bothy.

References

(Front cover)

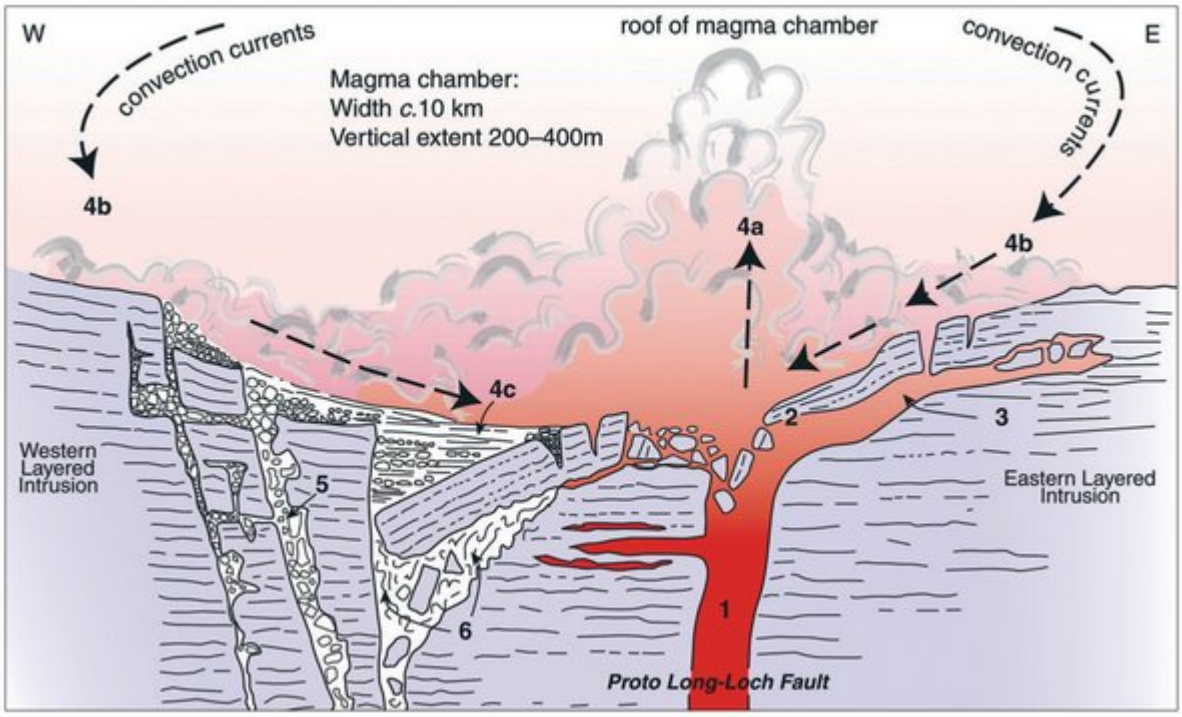


(Figure 8) Cross-section through the south-east portion of the Rum Central Complex (Askival–Beinn nan Stac–Sound of Rum), illustrating relationships and tectonics along the Main Ring Fault system, after Emeleus (1997) (see pp. 148–49 for full (Key).) (© NERC)

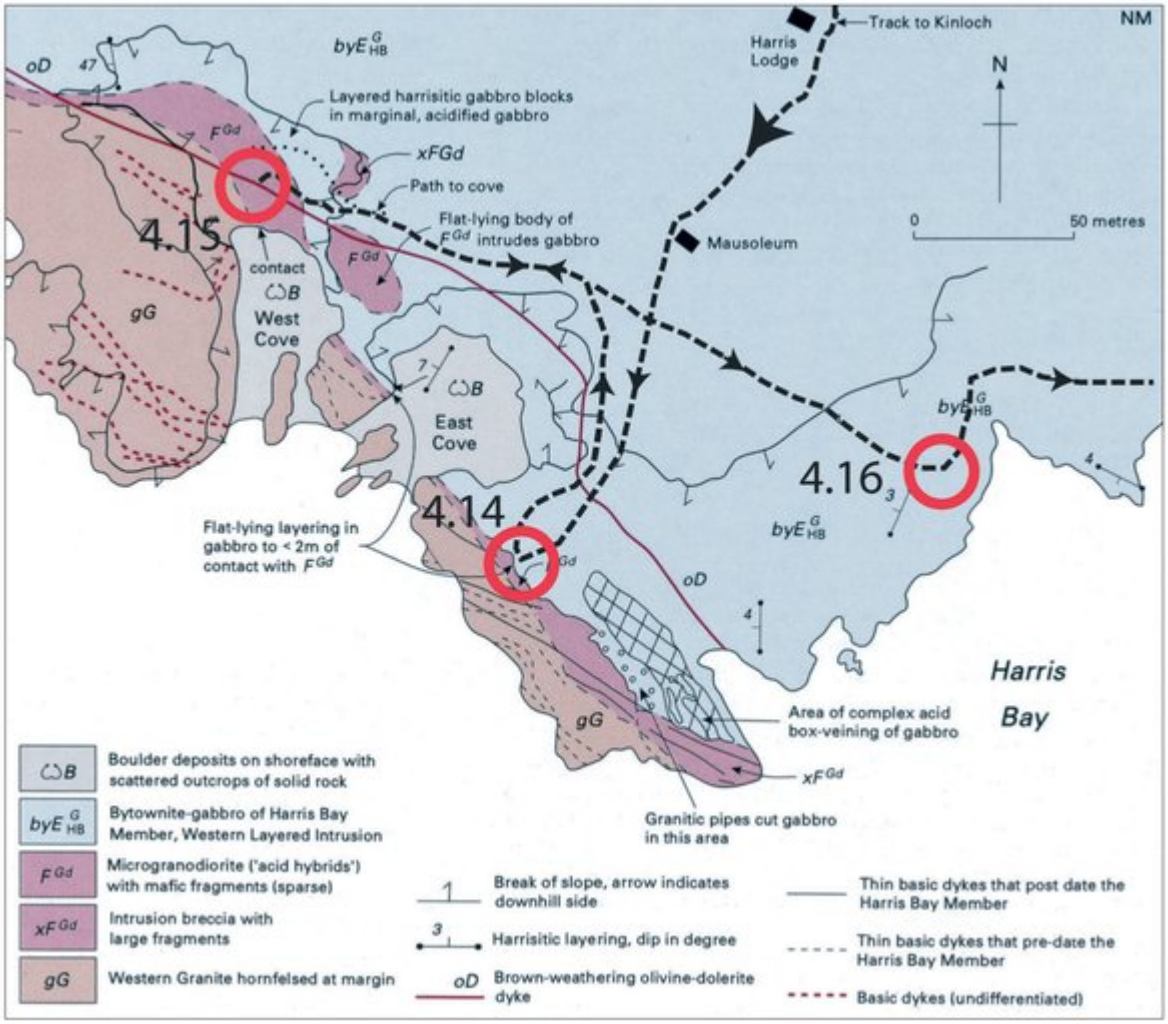


(Figure 13) Geological map of Excursion 2: the Northern Marginal Zone. Dykes and cone-sheets omitted. Modified after Emeleus and Bell (2005). (© NERC)

(Figure 25) Banded Lewisian granodioritic biotite gneisses with amphibolitic layers, near Priomh-lochs. (Photo: Emeleus/ BGS© NERC)



(Figure 43) Schematic representation of possible events leading to the formation of the Central Intrusion. Periodic replenishments of picritic magma (1) rejuvenated the magma chamber causing sliding and slumping (2) and intruded laterally into earlier cumulates (3). Magma fountaining into the chamber (4a) flows off the roof and down the sides as crystal-laden, gravity-driven currents (4b), dislodging crystal mushes as they move, then spread across the floor, reworking cumulate debris and depositing this material and primary crystals on the floor (4c). Movement on faults was accompanied by magma injection, thermal erosion of earlier rocks and their fragmentation to form breccia zones (5). Slides of coherent blocks of cumulate across partly liquefied cumulate led to spectacular slump mélanges (6). (Emeleus et al. [1996]. After Emeleus and Bell [2005].) (© NERC)

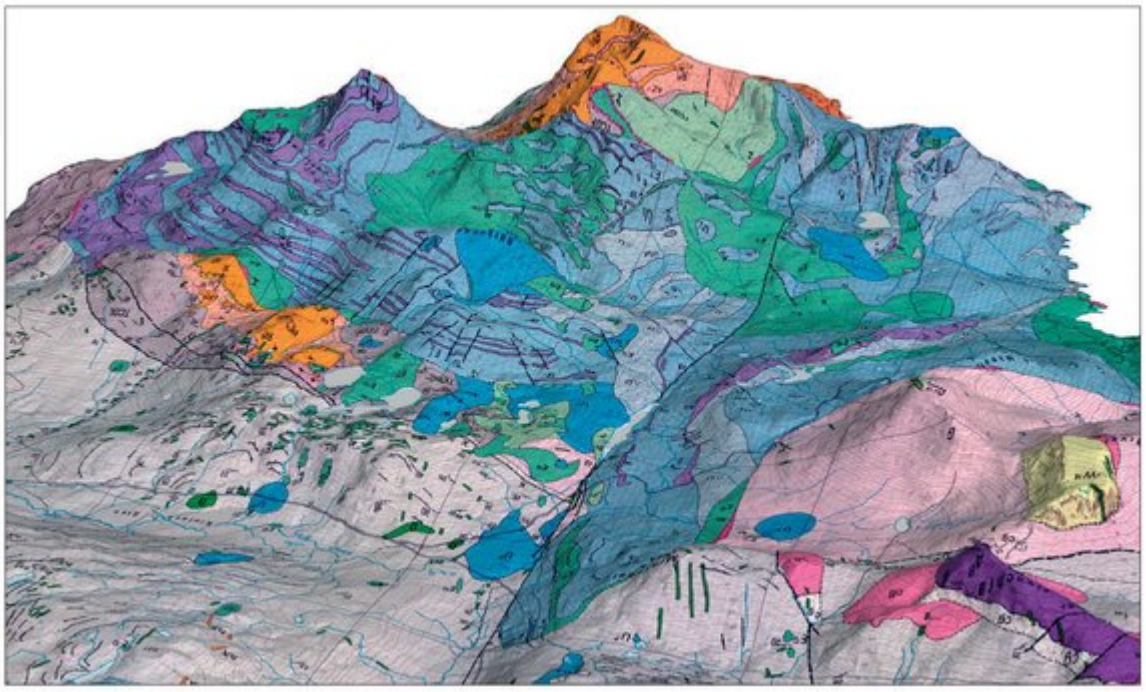


(Figure 45) Geological map of western Harris Bay, showing details of the contact between the Western Layered Intrusion and the Western Granite (after Emeleus, 1997 /© NERC) (Key).

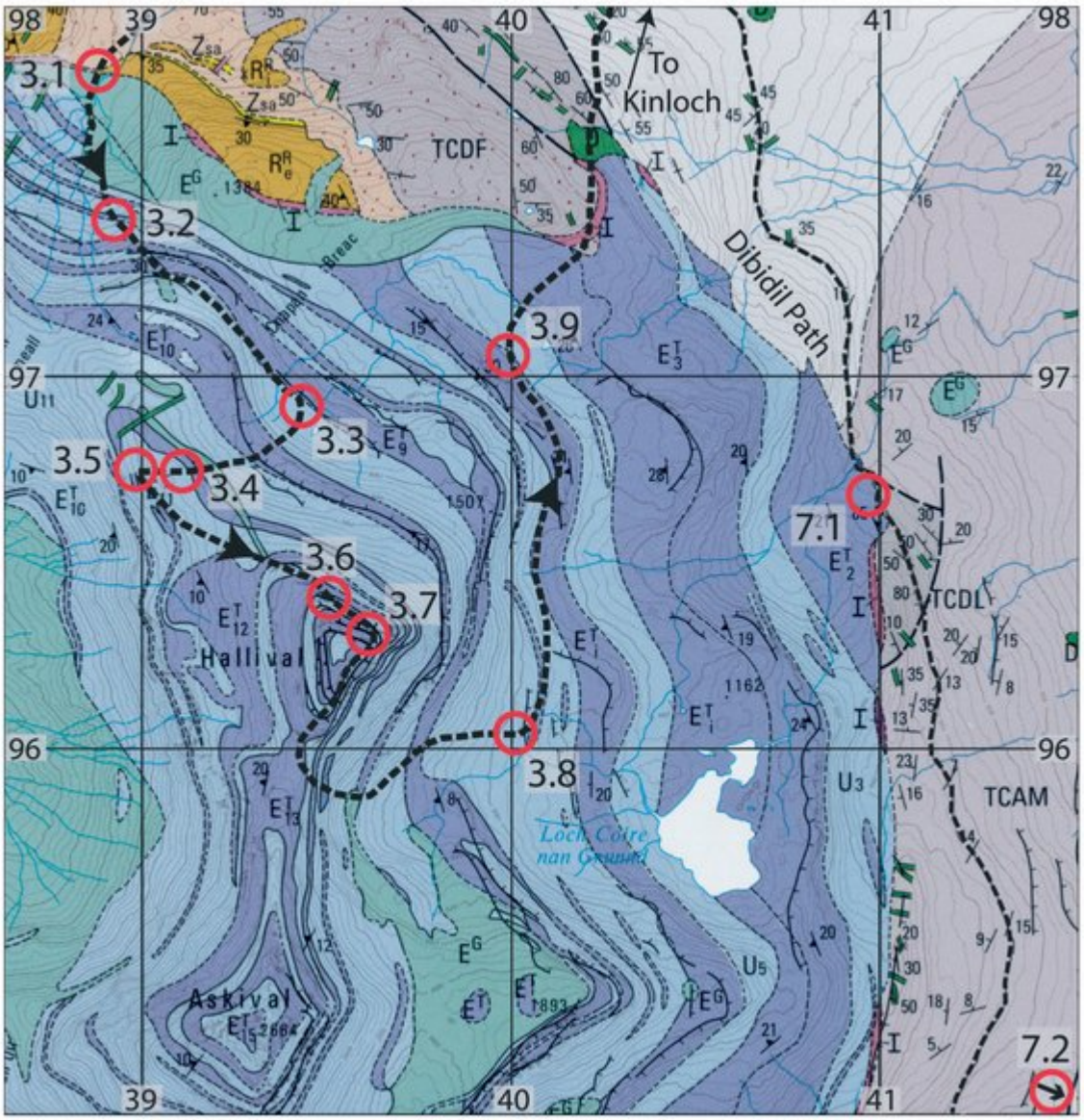
(Figure 49) Zone of intrusion breccia at the contact of the Western Granite with bytownite gabbro of the Western Layered Intrusion, Locality 4.17, East end of Harris Bay. The line of dark blocks is a dyke broken up in the remobilised acid (felsic) matrix. (Photo: Emeleus/BGS © NERC)

(Figure 54) Fluviatile conglomerates underlying tholeiitic basaltic andesite ('icelandite') lava flow (Guirdil Member, Canna Lava Formation). Locality 5.10, south side of Fionchra. Scale: hammer shaft: 30 cm. (Photo: Emeleus/BGS© NERC)

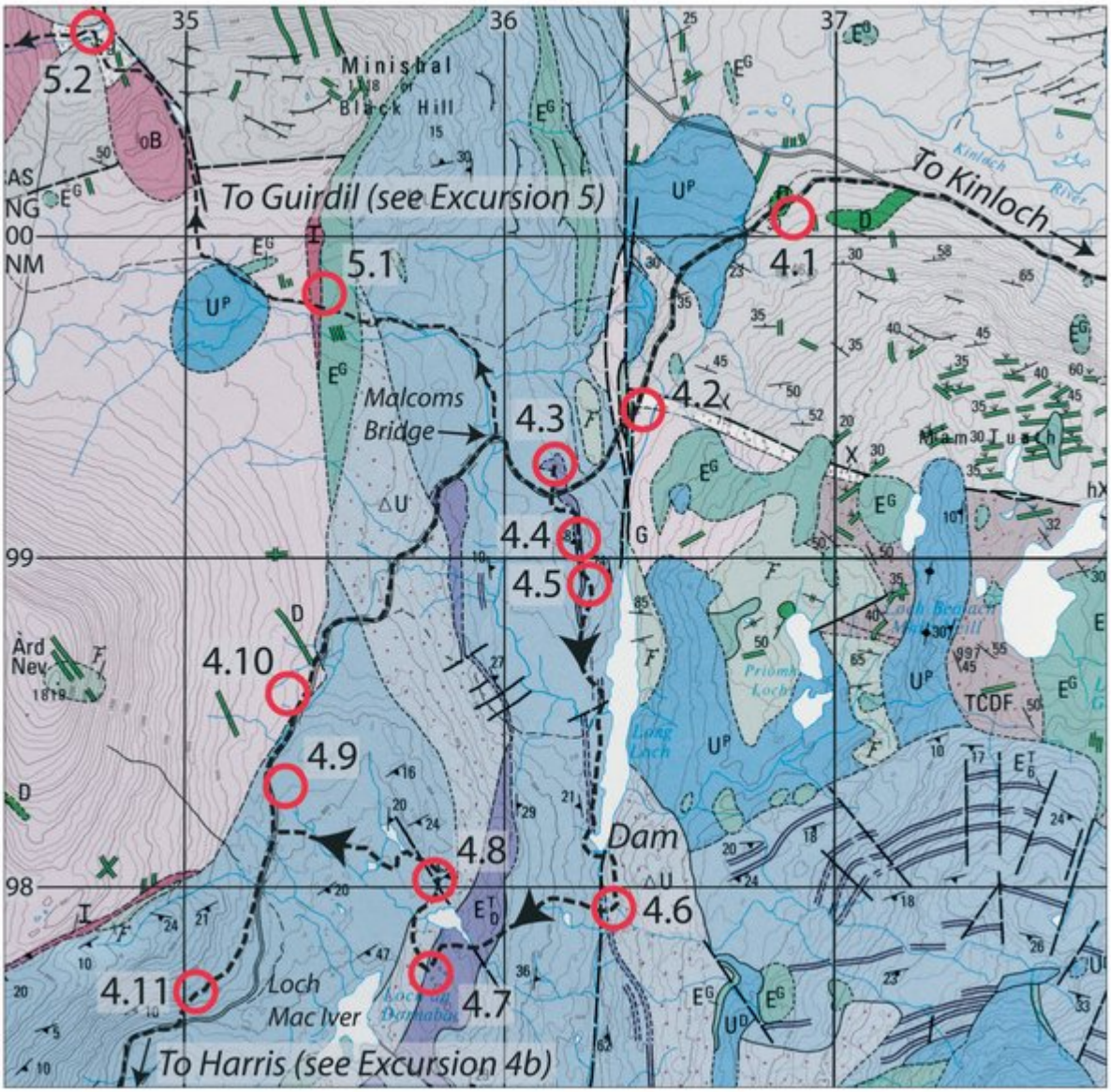
(Figure 61) Triassic Monadh Dubh Sandstone Formation (MODS) overlying Torridon Group, Aultbea Formation (TCSM). Cornstones in the basal Triassic beds form a white band half-way up cliff and permeate joints and bedding planes in the underlying Torridonian sandstones at the base of the cliff for up to 3 m. Thin basaltic sheets cut the Torridonian rocks. Locality 6.10, about 1 km north of Glen Shellesder, north-west Rum. (Photo: Emeleus/BGS© NERC)



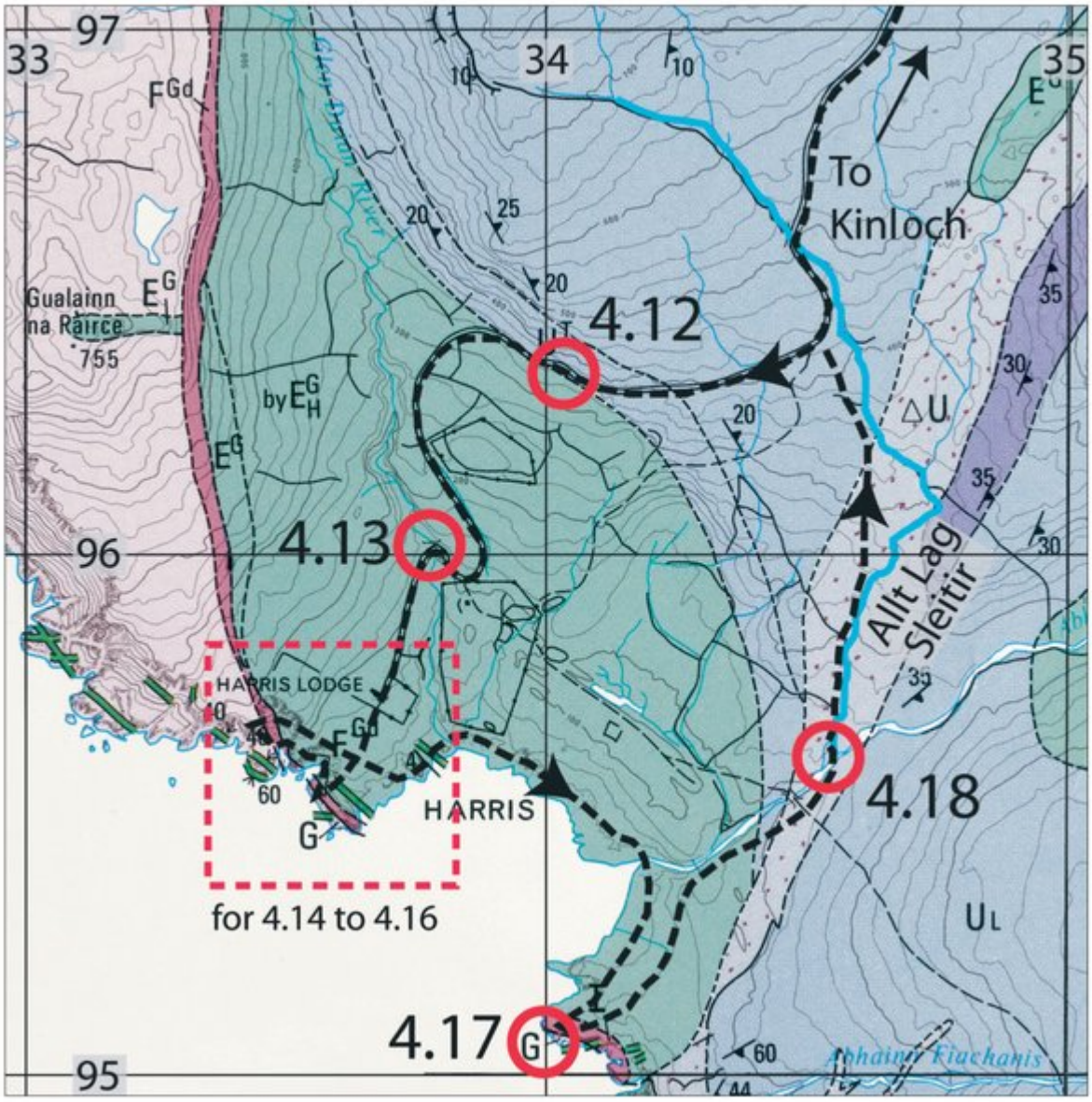
(Figure 6) Geological map draped over topography. Oblique view from the north-west (© Crown copyright/database right 2004; an Ordnance Survey/[Datacentre] supplied service. Courtesy of J. Barraud). The central complex is separated from the Torridonian country rock by a topographic shoulder that is also a geological boundary marking the Main Ring Fault. Note the pink and orange colours of Stage 1 rocks (rhyodacites and microgranites) being underlain and intruded by the ultrabasic rocks of Stage 2. Post- central complex igneous activity is marked by strong erosion and deposition of lavas of the Canna Lava Formation on the Western Granite and the MRF. ((Key) based on SNH 1:20,000 solid geology map; © SNH.)



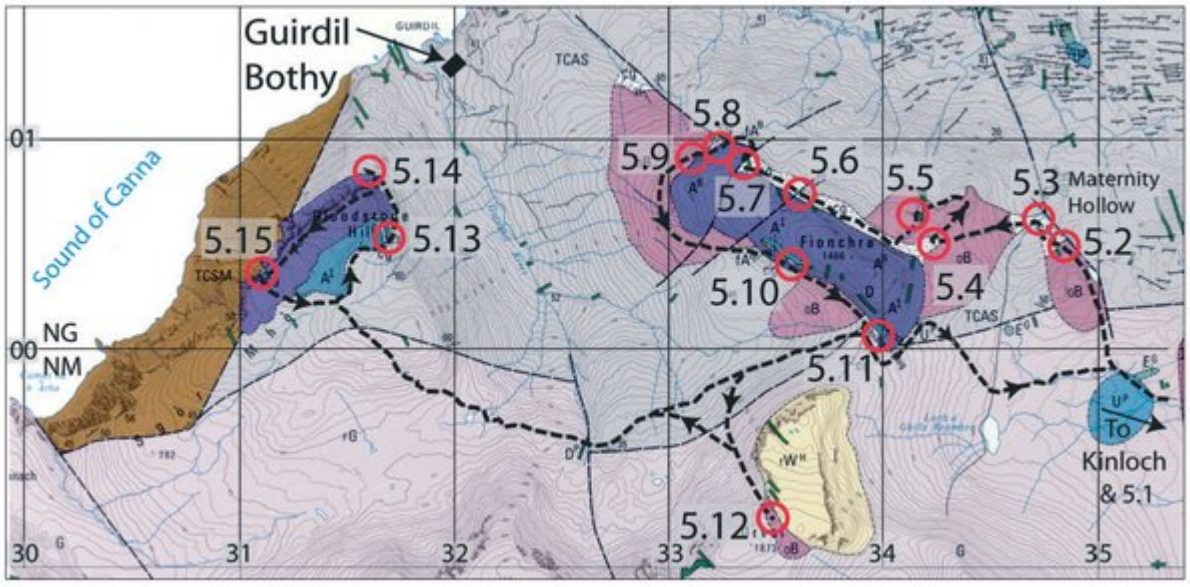
(Figure 26) Geological map of Excursion 3: Eastern Layered Intrusion, Hallival and Askival ((Key) ; based on SNH 1:20,000 solid geology map; © SNH).



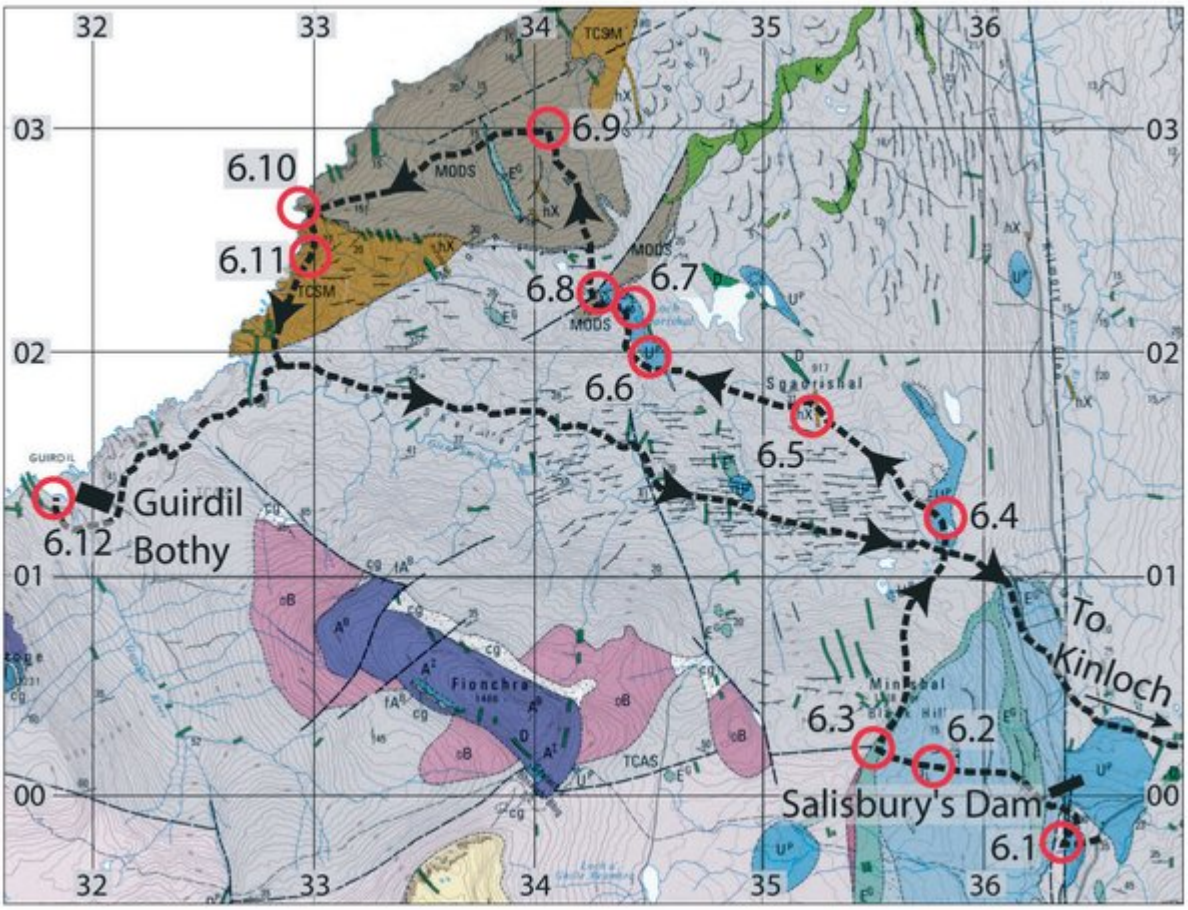
(Figure 33) Geological map of Excursion 4A, Central Rum, covering the northern end of the Central Intrusion and adjoining layered areas of the Eastern Layered Intrusion and Western Layered Intrusion ((Key) ; based on SNH 1:20,000 solid geology map; © SNH).



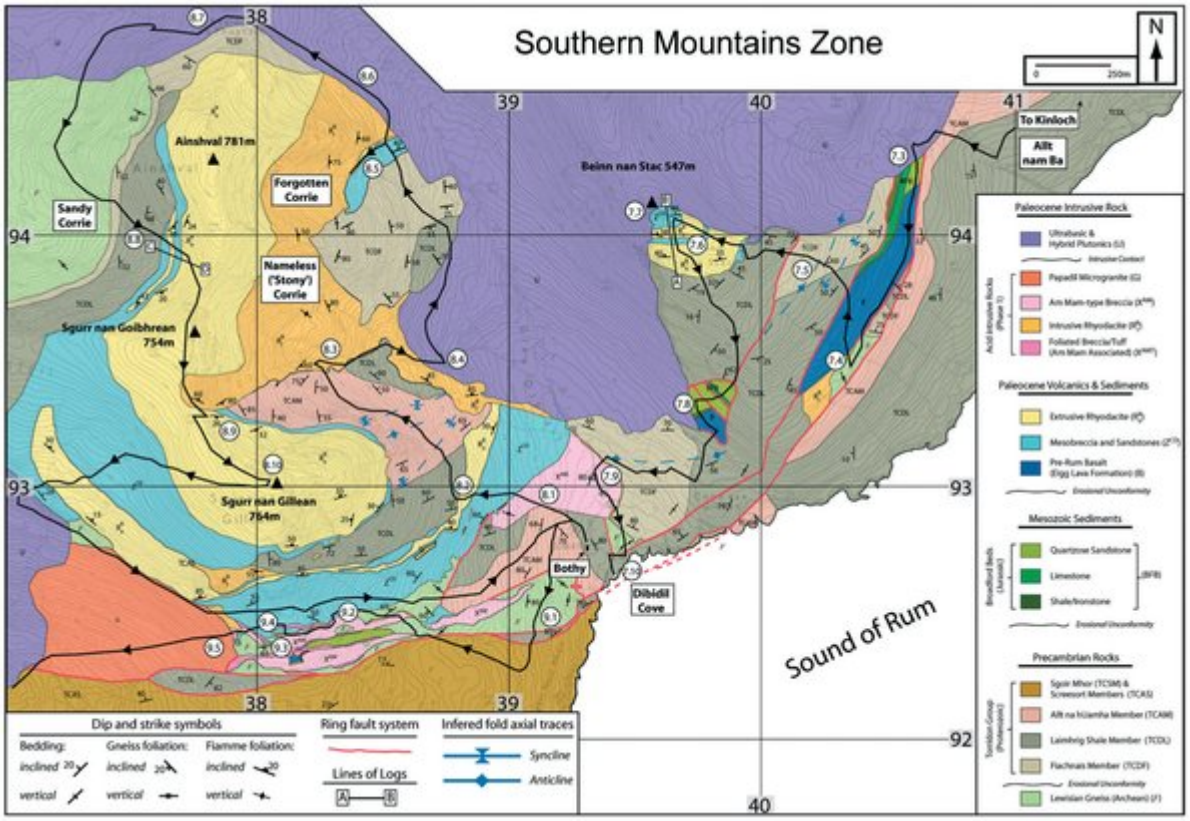
(Figure 44) Geological map of the Harris Bay area, Excursion 4b. ((Key) ; based on SNH 1:20,000 solid geology map; © SNH.)



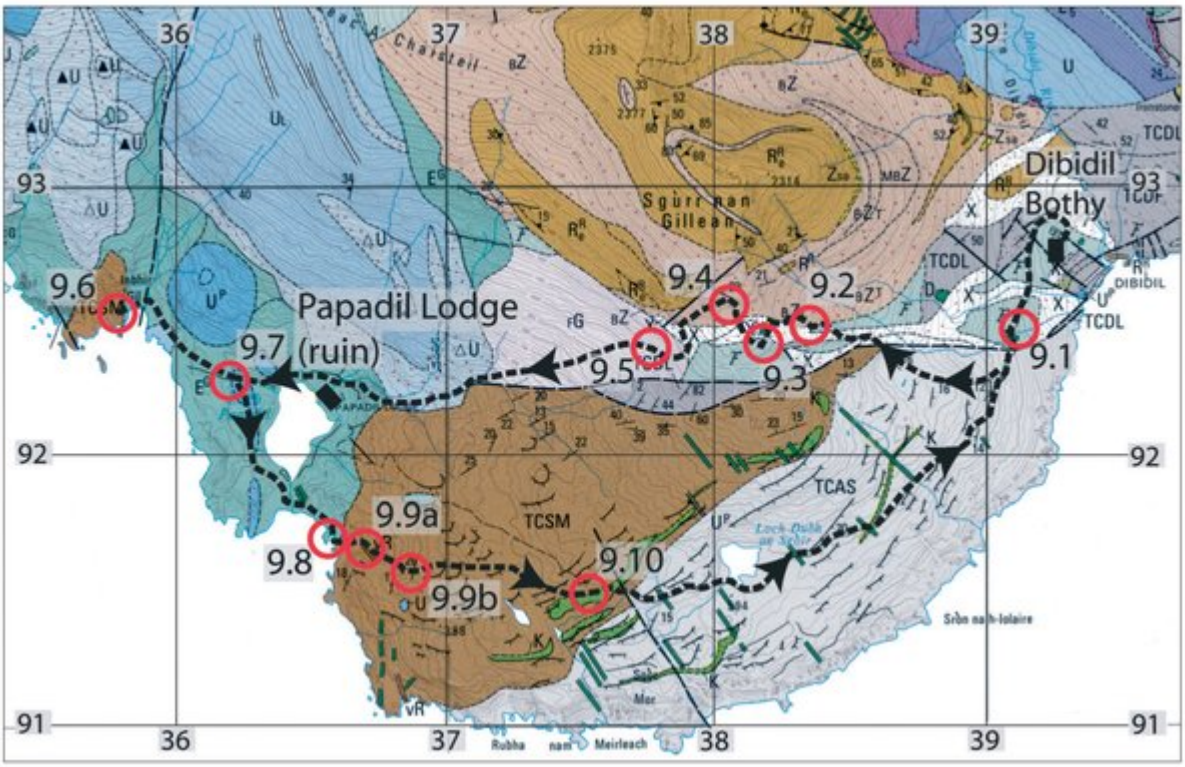
(Figure 51) Geological map of the Canna Lava Formation on Fionchra and Bloodstone Hill, north-west Rum. Excursion 5, for locality 5.1 and Kinloch road see (Figure 33). ((Key) ; based on SNH 1:20,000 solid geology map; © SNH.)



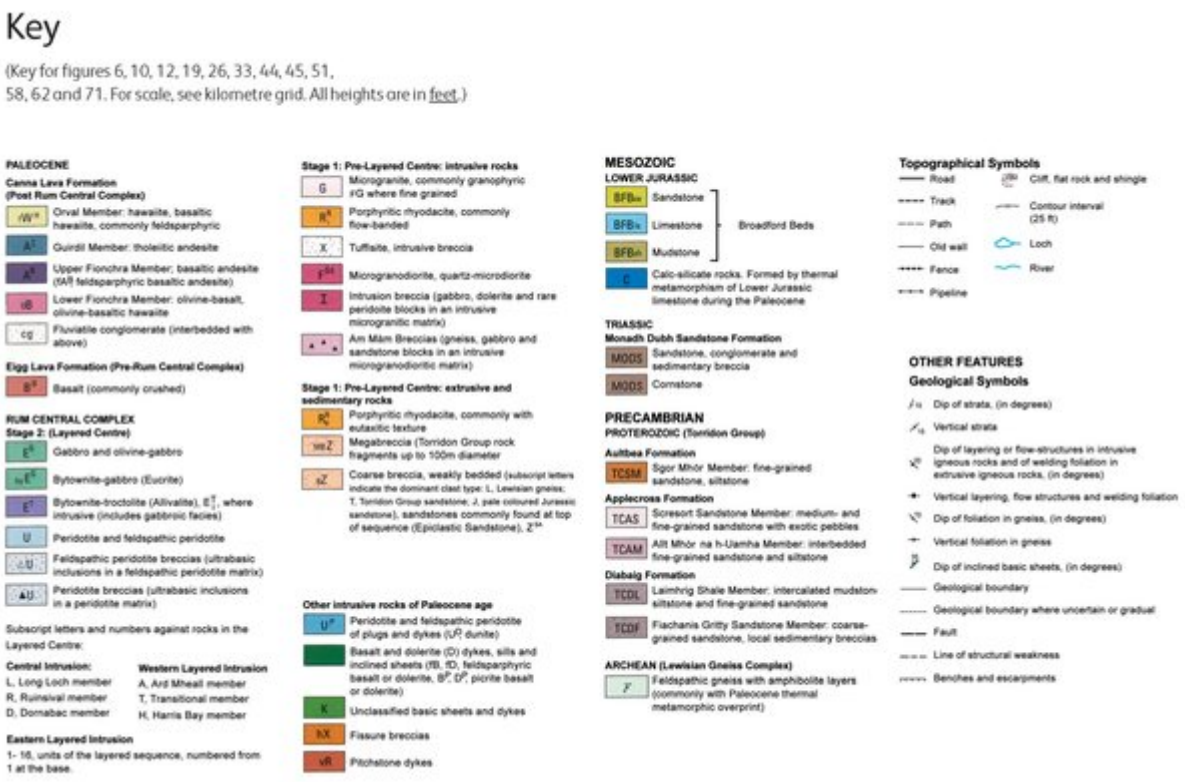
(Figure 58) Geological map of the north end of the Central Intrusion, Minishal and the country around Sgaorishal and the north-west coast of Rum. Excursion 6. (See pp. 148–49 for full (Key); based on SNH 1:20,000 solid geology map; © SNH.)



(Figure 62) Geological map of the Southern Mountains Zone. Based on SNH 1:20,000 solid geology map (© SNH), but extensively revised by E. Holohan and M. Errington. Excursions 7, 8 and part of 9. For localities 7.1 and 7.2 see (Figure 26), and for all of Excursion 9 see (Figure 71) (Key) .



(Figure 71) Geological map of the southern end of Rum from Sgurr nan Gillean to Rubha nam Meirleach. Excursion 9. ((Key); based on SNH 1:20,000 solid geology map; © SNH.)



(Key) Key for (Figure 6), (Figure 10), (Figure 12), (Figure 19), (Figure 26), (Figure 33), (Figure 44), (Figure 45), (Figure 51), (Figure 58), (Figure 62) and (Figure 71). For scale, see kilometre grid. All heights are in feet.) Key based on RUM – Solid Geology (© Scottish Natural Heritage 1992). Reproduced with the permission of the Scottish Natural Heritage. All rights reserved.

(Figure 1) General map of Rum, showing main geographical features.