Cuillin Hills 7:

Kilmarie to Sligachan

Blà-bheinn ('Blaven') (929m OD) from the Kilmarie-Camasunary track. This spectacular outlier of the Paleocene Cuillin Intrusive Centre remains in view for much of this wonderful low-level traverse through central Skye.

Aspects covered: Mesozoic sedimentary rocks; Paleocene lavas and dykes; Late Proterozoic ('Torridonian') sedimentary rocks; the Camasunary-Skerryvore Fault; Holocene raised marine deposits; the Coire Uaigneich Granite; Ordovician marbles and the Kishorn Thrust; a complex marginal facies of the Paleocene Cuillin Intrusive Centre; Torridonian sedimentary rocks subjected to high-temperature contact metamorphism and melting; granites and related rocks of the Srath na Crèitheach and Western Red Hills intrusive centres.

Route: Kilmarie - Am Màm - Abhainn nan Leac – Camas Fhionnairigh - Camasunary (Cottage) - Abhainn Camas Fhionnairigh - Loch na Crèitheach - Srath na Crèitheach - Harker's Gully, Marsco - Glen Sligachan - Allt na Measarroch - Sligachan.

Distance: *c.* 17 kilometres.

Time: Up to 10 hours, but can be shortened by omitting examination of rocks at certain localities along the route, restricting excursion to more of a walk-through and enjoying the 'big picture' geology.

General comments: A long one-way route, requiring transport to/from beginning/end. Requires good weather and only suitable for those capable of its 17km+ length. If detour onto the lower slopes of Marsco is avoided, then most of the excursion is low-level, below 60m OD.

Proceed to Kilmarie [NG 5452 1721] on the Broadford-Elgol (B8083) road, 19km (12 miles) SW of Broadford. Here, the Camasunary Track joins the main road. Space for vehicles is available on the east side of the road.

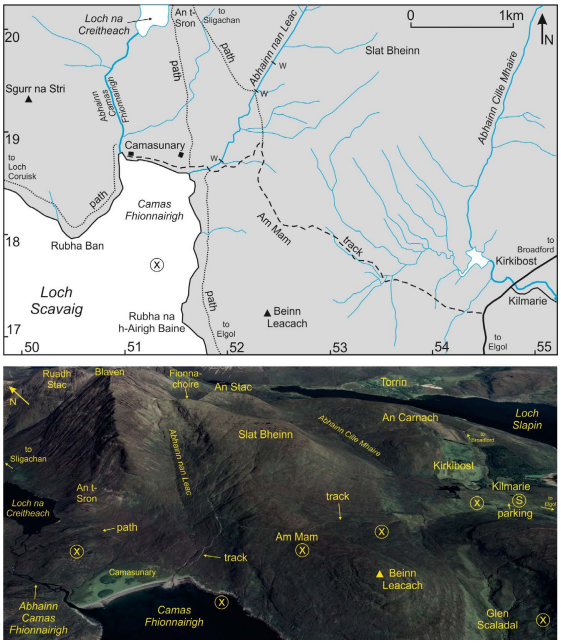

Figure Cuillin 7.1: Route map and annotated oblique Google Earth® image for the Kilmarie to Camasunary part of the excursion.

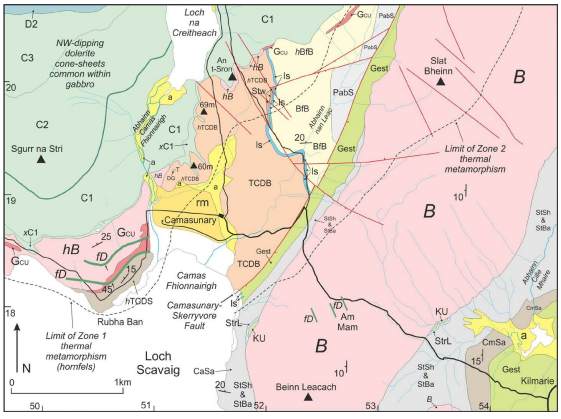

Figure Cuillin 7.2: Summary map and key for the Camasunary Bay area.

Figure Cuillin 7.3: Camasunary Bay viewed towards the west from the main access track. The summit in the middle ground is Sgùrr na Stri, composed of layered bytownite gabbros, intruded by dolerite cone-sheets dipping towards the NW (right) of the Paleocene Cuillin Igneous Centre. The lower ground to the south (left of) the summit of Sgùrr na Stri comprises country-rock Paleocene lavas overlying Late Troterozoic ('Torridonian') sedimentary rocks. In the distance is the main arc of the Cuillin Hills.

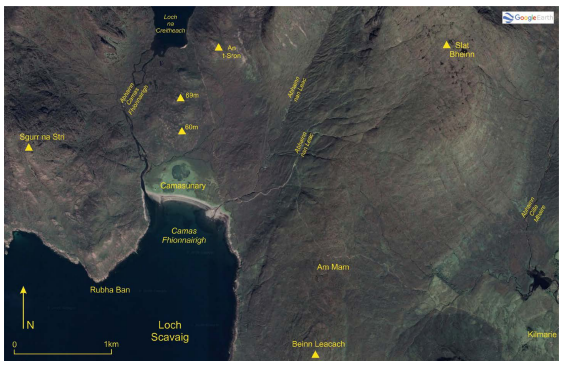

Figure Cuillin 7.4: Annotated Google Earth® image of the Camasunary Bay area.

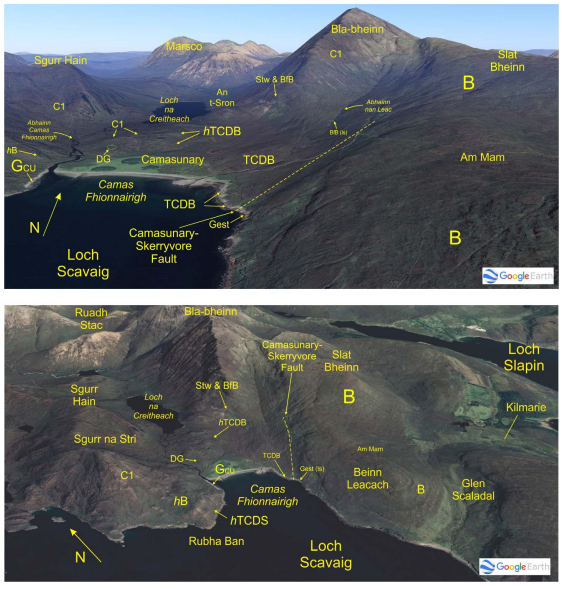

Figure Cuillin 7.5: Annotated oblique Google Earth® images of the Camasunary Bay area. Lithology codes as per Figure Cuillin 7.2, above.

Locality 1 [NG 5449 1720]:

Towards the NE from the beginning of the Camasunary Track at Kilmarie, note the trap topography of Slat Bheinn and An Càrnach to the north, with Paleocene plateau lavas overlying the lower cultivated ground composed of Middle and Upper Jurassic sedimentary rocks, all of which dip at a shallow angle to the west. At least twenty lavas (or flow units of compound lavas) may be identified readily on Slat Bheinn. In the immediate area, especially in the vicinity of the track, are poorly exposed Jurassic strata belonging to the Great Estuarine Group, intruded by NW-SE -trending Paleocene dolerite dykes.

Proceed 1.5km (1 mile) along the track over Jurassic strata (Great Estuarine Group and Staffin Bay Formation) to where a gate crosses the path.

Locality 2 [NG 5344 1772]:

Exposed on the track, 30m west of the gate, are basaltic lavas at the base of the Paleocene plateau sequence. These amygdaloidal lavas are distinctly green and contain visible secondary chlorite, epidote, albite, calcite and quartz, hence the green coloration. Secondary zeolites are rare. Fresh olivine is uncommon and is typically replaced by aggregates of chlorite, serpentine, talc, magnetite and carbonate,. Primary features of the lavas, such as flow structures, have been destroyed by the pervasive hydrothermal (meteoric) fluid circulation and alteration which occurred in the Paleocene.

From here, continue NW along the footpath, upwards through the lava sequence, to Am Màm.

Locality 3 [NG 5269 1803]:

At Am Màm, 25m south of the path, a large dolerite dyke (at least 10m wide) forms a prominent feature, trending *c.* 150°. This intrusion consists of euhedral calcic plagioclase megacrysts (typically up to 10mm) and olivine phenocrysts (1–2mm), set in a fine-grained, dark groundmass. A vertical contact to this dyke is exposed on its west side, together with a 30cm-thick skin of contact-metamorphosed plateau lava.

Figure Cuillin 7.6: Plagioclase-porphyritic dolerite dyke intruded into (poorly exposed) basalt lavas at Am Màm. View is towards south. Iain Allison for scale.

Continue along the track to where Camasunary Bay is fully visible. This is a spectacular view, one of the best on Skye and a wonderful reward for a modest walk of an hour, or less.

Locality 4 [NG 5180 1863]:

Continue along the track, down into Camasunary Bay. In doing so, you cross the poorly exposed Camasunary (-Skerryvore) Fault, which brings Middle Jurassic strata on the eastern (downthrow) side into contact with Late Proterozoic 'Torridonian' strata on the western (upthrow) side. The location of the fault is better constrained on the coast on the eastern side of the bay, outlined below.

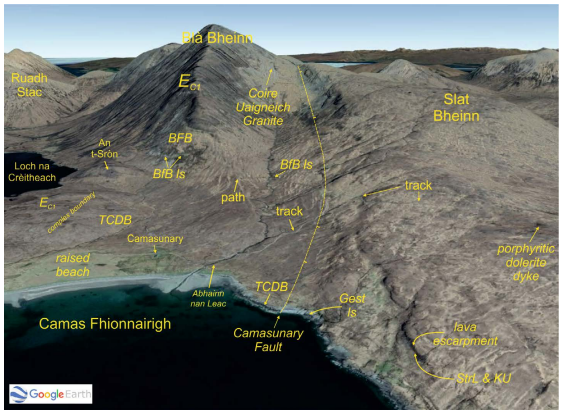

Figure Cuillin 7.7: Annotated oblique Google Earth® image, approximately towards north, of the east side of Camasunary Bay, indicating the location of the Camasunary (-Skerryvore) Fault, the Blà-bheinn Member Torridonian strata, the Great Estuarine Group strata, and other general points of interest. Lithology codes as per Figure Cuillin 7.2, above.

In the vicinity of the bridge over the Abhainn nan Leac, relatively undeformed Torridonian siltstones, sandstones and grits of the Blà-bheinn Member are exposed but lack clear evidence of cross-bedding and grading, more obvious in coastal exposures to the south (see below). Paleocene basaltic and doleritic dykes of the NW-SE -trending regional swarm cut these rocks and are exposed in the stream bed south of the bridge.

Follow the rough path to the south, to the rocky coast south of the bothy (built in 2015 and maintained by the Mountain Bothies Association).

Locality 5 [NG 5169 1820]:

Follow the path down to the east side of the bay, near to the bothy. Here, steeply dipping Torridonian strata of the Blà-bheinn Member of the Diabaig Formation (Torridon Group), intruded by Paleocene basaltic and doleritic dykes, are exposed on relatively clean surfaces.

The Camasunary (-Skerryvore) Fault is not exposed but is relatively well constrained. Cross the small beach to the downside of the fault, where various limestones, sandstones and siltstones of the Middle Jurassic Great Estuarine Group are exposed.

Figure Cuillin 7.8: Dark basaltic and doleritic dykes with irregular margins within pale, stratified Blà-bheinn Member ('Torridonian') strata, on the eastern side of Camasunary Bay, immediately west of the Camasunsary (-Skerryvore) Fault. Pole *c.* 1m long.

Figure Cuillin 7.9: Interbedded sandstones, siltstones and limestones of the Great Estuarine Group intruded by dolerite and basalt sheets, east of the Camasunary (-Skerryvore) Fault.

Figure Cuillin 7.10: Interbedded sandstones, siltstones and limestones of the Great Estuarine Group intruded by dolerite and basalt sheets, east of the Camasunary (-Skerryvore) Fault. Pole *c.* 1m long.

Figure Cuillin 7.11: Burrows within limestone (partially recrystallized during thermal metamorphism) of the Great Estuarine Group, east of the Camasunary (-Skerryvore) Fault. Coin *c.* 20mm across.

Locality 6 [NG 5155 1878]:

Camasunary Cottage sits upon raised marine deposits, formed when relative sea-level was higher in response to Holocene glacio-isostatic uplift (rebound due to retreat of the ice) and eustatic sea-level change.

The hummocky ground *c.* 500m to the NW constitutes the irregular boundary between the Cuillin Intrusive Centre and Torridonian country-rocks and will be examined later in this excursion.

Continue westwards to the Abhainn Camas Fhionnairigh.

Caution needs to be exercised when crossing the river. It is tidal (where entering the bay) and, during periods of high tide, can only be crossed further (sometimes much further) upstream. During periods of high rainfall, even at low tide, the river may be difficult to cross. Conversely, during periods of drought, at low tide, the river can be safely crossed with ease (and exceptionally with dry boots).

Omit this locality if crossing the Abhainn Camas Fhionnairigh proves to be difficult.

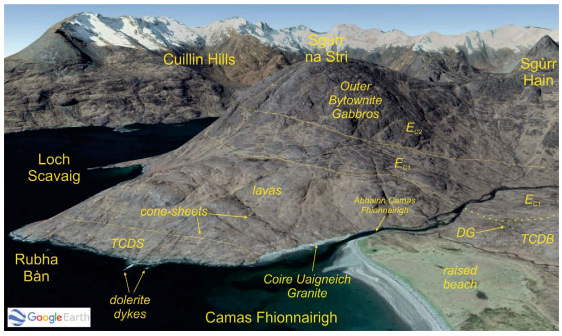

Figure Cuillin 7.12: Annotated oblique Google Earth® image, NW towards Sgùrr na Stri, illustrating the distribution of the Sgùrr na Stri Member (TCDS) Torridonian strata, Paleocene (plateau) lavas, and units of the Outer Bytownite Gabbros (E), together with other general points of interest. Lithology codes as per Figure Cuillin 1.2, above.

Locality 7 [NG 5094 1873]:

The approximate location of the contact between the Paleocene plateau lavas and the Coire Uaigneich Granite can be identified on the west side of the river. The contrasting rock-types, the dark green lavas and the pale grey granite, are readily distinguished. Brecciation by the younger granite has led to the incorporation of blocks of the lava. The boundary between these two rock-types dips to the SE at *c.* 60°. 10–20m south from this contact, where the granite is exposed on the wave-cut platform, several of its features may be observed. First, scattered xenoliths of Torridonian sedimentary rock, in various stages of digestion, may be identified. These xenoliths are typically 1–10cm across, although 'rafts' up to 5m long are also present. Their margins are commonly irregular and diffuse. This foreign material is typically finer-grained and somewhat darker than the granite. Second, the granite is pale grey and contains needles of hypersthene, up to 1cm long (commonly altered to chlorite), together with less obvious phenocrysts of sodic plagioclase, tridymite (now inverted to quartz) and Fe-Ti oxide. The distribution of these minerals is irregular, and all are set in a granophyric groundmass of alkali feldspar and quartz. Cone-sheets associated with the nearby Cuillin Intrusive Centre cut the Coire Uaigneich Granite but are not found within the clearly younger granites of the Srath na Crèitheach, Western Red Hills and Eastern Red Hills intrusive centres, providing a useful relative order of emplacement.

Figure Cuillin 7.13: Clean exposed surfaces of the Coire Uaigneich Granite on shore west of the Abhainn Camas Fhionnairigh, with inclusions/xenoliths of modified Torridonian material. Pole *c.* 1m long.

Figure Cuillin 7.14: Clean exposed surface of the Coire Uaigneich Granite on shore west of the Abhainn Camas Fhionnairigh, with an inclusion of modified Torridonian (sedimentary) material. Coin *c.* 26mm across.

The outcrop of the granite may be traced along the beach to where it gives way, abruptly, to well-bedded Torridonian siltstones, sandstones and grits of the Sgùrr na Stri Member, dipping at a shallow angle to the NW. The (intrusive) contact strikes *c.* 040° and dips at *c.* 35° to the NW.

The Torridonian strata south of the Coire Uaigneich Granite outcrop, as far as Rubha Bàn, are attributed to the Sgùrr na Stri Member and are predominantly relatively fine-grained, comprising tabular, well-bedded, siltstones and shales. These strata contain obvious ripples, as seen in both cross-section and plan view, and are interpreted to have been deposited in a relatively low energy, possibly lacustrine, environment. These remarkably clean exposures should be examined as far south as the prominent NW-SE –trending dolerite dykes that form obvious small promontories.

Figure Cuillin 7.15: Tabular fine-grained sandstones, siltstones and shales with well-developed ripples in the Sgùrr na Stri Member, in the coastal section on the west side of Camas Fhionnairigh. Pole *c.* 1m long.

Figure Cuillin 7.16: A thick, NW-SE –trending dolerite dyke of the Paleocene regional dyke swarm intruded into Sgùrr na Stri Member strata on the coast SE of Sgùrr na Stri. Further inland, to the NW, this dyke, and many others, cut (lower units) of the overlying lava sequence.

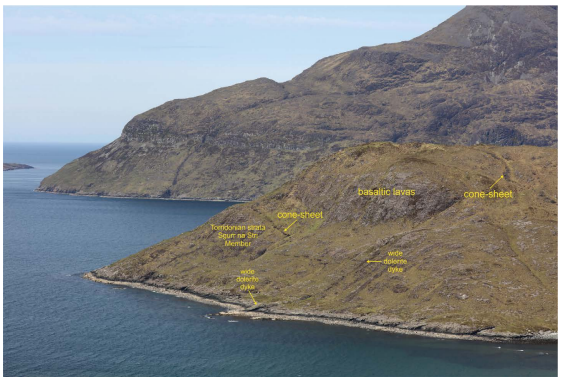

Figure Cuillin 7.17: The south side of Sgùrr na Stri, viewed towards the west. The Torridonian strata of the Sgùrr na Stri Member and the overlying hornfelsed basaltic lavas have distinctive topographic expressions. Cone-sheets of the Cuillin Intrusive Centre and NW-SE –trending dykes of the Paleocene regional swarm are also readily identified by their topographic expressions.

Figure Cuillin 7.18: The SE side of Sgùrr Hain from Camasunary, comprising layered bytownite gabbros intruded by cone-sheets and dykes. The pale rocks in the foreground are thermally metamorphosed (Torridonian) strata of the Blà-bheinn Member**.**

The basaltic lavas that overlie the Sgùrr na Stri Member can be examined on the lower slopes on the west side of the Abhainn Camas Fhionnairigh. Walking up the west

bank of the river to a point opposite the northern limit of the raised beach in the bay, gain the higher ground where obvious relatively dark crags are composed of the lavas.

Locality 8 [NG 5079 1911]:

The typical terraced character of the lavas is absent, and it is difficult to identify individual lava tops and bases. The rocks are thermally metamorphosed, to pyroxene hornfels grade, and, consequently, are considerably altered, also containing abundant veins of secondary hydrothermal minerals. Fresh rock surfaces are typically grey-green or grey-blue, with the original magmatic minerals replaced by metamorphic pyroxene and plagioclase in a typically granulitic arrangement. Primary joints (including any columnar joints) are sealed with hydrothermal minerals such as epidote, chlorite, various zeolites and carbonates. Amygdaloidal texture is still preserved and is one of the few features of these rocks that aid the interpretation of their field relationships as lavas. Amygdale mineral assemblages include chlorite, prehnite and plagioclase, not easily distinguished in the field.

Figure Cuillin 7.19: Hornfelsed basaltic lava on the west side of the Abhainn Camas Fhionnairigh, *c.* 60m above the level of the river, with abundant veins containing various secondary hydrothermal minerals, including epidote, chlorite, various zeolites and carbonates. Hammer *c.* 30cm long.

Figure Cuillin 7.20: Detail of hornfelsed basaltic lava on the west side of the Abhainn Camas Fhionnairigh, *c.* 60m above the level of the river, with amygdale mineral assemblages including epidote, chlorite, various zeolites and carbonates. Length of hand lens *c.* 50mm.

Re-cross the Abhainn Camas Fhionnairigh, onto its east side, to where remnants of a stone wall run at right-angles to the river at [NG 5092 1922]. Follow the wall eastwards to where it goes through a right-angle and trends north, but continue eastwards for *c.* 60m to an area of bright green grass at [5110 1924].

Locality 9 [NG 5110 1924]:

Here, a small outcrop of marble, encircled and partially covered by a *c.* 15m x 10m area of bright green grass, sits in isolation. High grade thermal metamorphism of original limestone by the Cuillin Intrusive Centre in the Paleocene resulted in the development of the marble.

This outcrop of marble has been variously interpreted as: (a) *in situ* material of Jurassic age unconformably overlying Torridonian strata (Blà-Bheinn Member); (b) Jurassic age limestone within a fault-block; and, (c) Durness Group Cambro-Ordovician dolostone in a thrusted contact with (structurally overlying) Torridonian strata (Blà-Bheinn Member). The last of these three interpretations infers that the Moine Thrust Belt extended this far west. Chert nodules and stringers are relatively common in this impure marble, very similar to material that crops out to the east in the district of Strath, in the area around Torrin. During high-temperature thermal metamorphism, in the Paleocene, a complex, high-grade mineral assemblage formed, which includes wollastonite, melilite, spurrite, garnet, monticellite and perovskite, possibly at a temperature in excess of 900°C.

Figure Cuillin 7.21: Isolated outcrop of marble, most likely originally Durness Group Cambro-Ordovician dolostone, on the west side of Camasunary Bay. Pole *c.* 1m long.

Return to the right-angled junction of the old wall and follow the N-S –trending portion to where it meets large relatively continuous exposures of glacially-moulded gabbro.

Locality 10 [NG 5097 1965]:

These slabs are composed of relatively homogeneous unlayered gabbro belonging to the marginal E_{C1} unit, cut by numerous dykes of the regional swarm. This variety of gabbro, in which the plagioclase crystals are calcium-rich (hence the term Bytownite Gabbro), is composed predominantly of clinopyroxene (augite) and plagioclase

(bytownite to labradorite), together with lesser amounts of olivine, orthopyroxene (commonly pseudomorphed by bastite) and Fe-Ti oxides. Large ovoid segregation pods and veins are common, containing large (up to 20mm) crystals of augite and plagioclase. These crystals have developed in response to a more hydrous environment during crystallisation. Also present within the gabbro are large xenoliths of gabbro, dolerite and basalt, up to several metres across.

Figure Cuillin 7.22: Marginal facies of the E_{C1} unit, comprising unlayered bytownite gabbro, locally with xenoliths of gabbro, dolerite and basalt, intruded by NW-SE –trending basalt and dolerite dykes of the Paleocene regional swarm, together with minor gabbro pegmatites. View is SE towards Camasunary Cottage. Pole *c.* 1m long.

In a traverse from this area, SE, towards the margin of the intrusion and onward into the adjacent country-rock Blà-bheinn Member (Torridonian) strata, the relatively simple character of the rock sequence/section changes in a predictable, though locally variable manner (**b** → **a** in Figure Cuillin 1.23):

1. Marginal gabbro(s) with veins of pale felsite and micro-granite;

2. Localised breccias dominated by a matrix of similar pale material, with angular fragments of gabbro, dolerite and basalt;

3. Dominant fine-grained pale material that upon close inspection is stratified, although locally somewhat disrupted, and interpreted as the country-rock Torridonian strata;

4. Abundant veins, with a variety of orientations, containing hydrothermal minerals such as chlorite, epidote and carbonates;

5. Dykes divergent from their normal NW-SE –trends, commonly with irregular (or non-planar) margins, also veined by felsite and micro-granite;

6. Clearly recognisable Torridonian strata of the Blà-bheinn Member, comprising mainly fine- to medium-grained sandstones.

Essentially, over this *c.* 300m traverse, is a complex contact interval between the marginal gabbros and the country-rock Torridonian strata. The various heterogeneous lithologies within the interval have formed by the intense heating, deformation and partial melting of the country-rock sandstones by the 'gabbro' magma(s), with the resultant silicic magma back-veining the gabbro during its progressive cooling and crystallisation. The lithologies encountered in this traverse are of almost infinite variability and worthy of careful examination and contemplation; this is a remarkable contact metamorphic aureole.

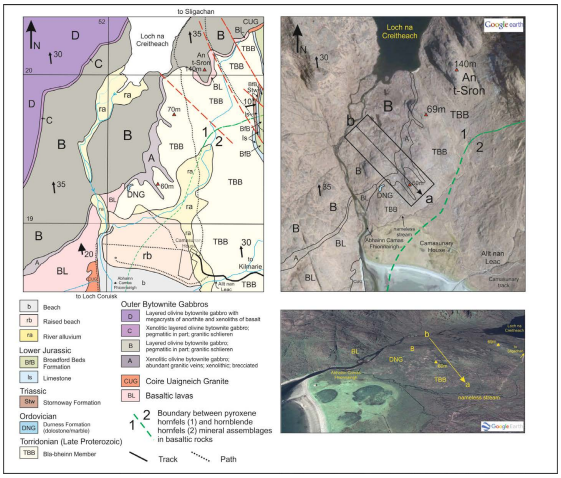

Figure Cuillin 7.23: Location of traverse in Camasunary Bay, where Torridonian strata (Blà-bheinn Member) are the dominant country-rocks, displaying increasing degrees of modification towards the margin of the Paleocene Cuillin Intrusive Centre.

Figure Cuillin 7.24: Granitic veins within marginal gabbro of the Cuillin Intrusive Centre, Camasunary Bay. Pole *c.* 1m long.

Figure Cuillin 7.25: Granitic veins within marginal gabbro of the Cuillin Intrusive Centre, Camasunary Bay. Pole *c.* 1m long.

Figure Cuillin 7.26: Sheets of dolerite with non-planar margins within thermally metamorphosed Torridonian sandstones, Camasunary Bay. Pole *c.* 1m long.

Figure Cuillin 7.27: Dominant stratified thermally metamorphosed Torridonian sandstones (Blà-bheinn Member), Camasunary Bay. Pole *c.* 1m long.

Traverse north to the southern end of Loch na Crèitheach and thence north on the path on the east side of the loch, with Blà-bheinn towering above to the east (right).

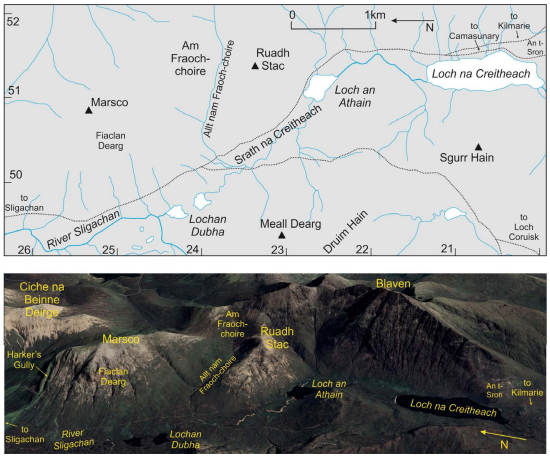

Figure Cuillin 7.28: Route map and an annotated oblique Google Earth® image for the Loch na Crèitheach - Marsco part of the excursion.

ESE of Loch an Athain, the Blaven Granite of the Paleocene Srath na Crèitheach Intrusive Centre forms the lower part of Blà-bheinn. The granite is readily distinguished from the dark layered bytownite gabbros that dominate Blà-bheinn by its rusty-brown character.

North of Loch an Athain are Meall Dearg and Ruadh Stac, Red Hills composed of the Meall Dearg Granite on the upper slopes of both hills, with the Ruadh Stac Granite, beneath, forming the lower ground. Both intrusions are members of the Srath na Crèitheach Intrusive Centre.

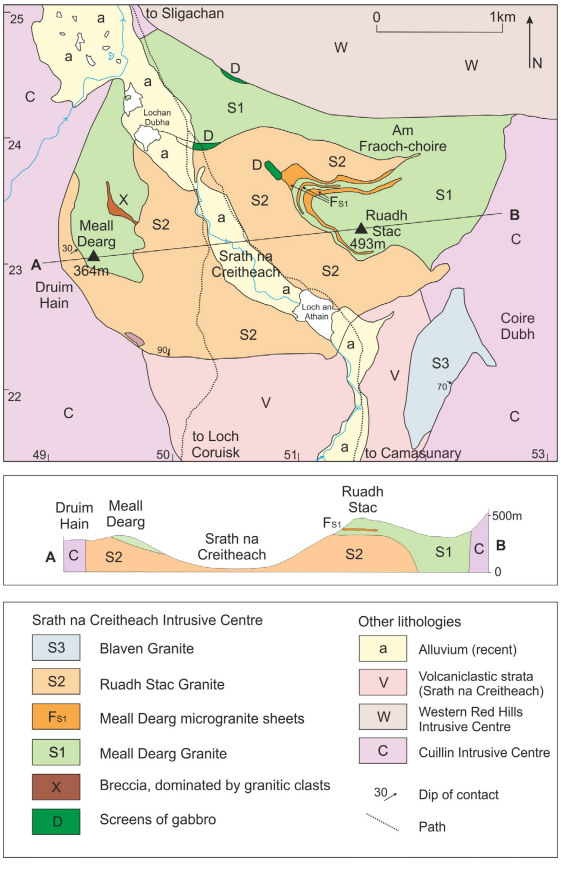

Figure Cuillin 7.29: Summary geological map and cross-section for Srath na Crèitheach, with the Meall Dearg Granite forming the upper parts of Meall Dearg and Ruadh Stac, and the Ruadh Stac Granite, beneath, forming the lower parts of the two hills. The Blaven Granite forms the lower part of the west side of Blà-bheinn.

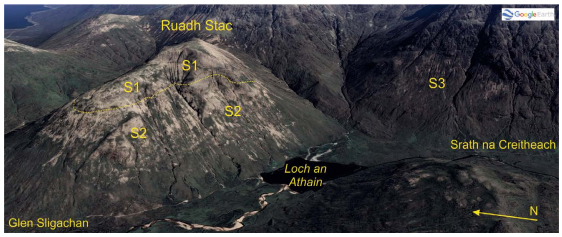

Figure Cuillin 7.30: Annotated oblique Google Earth® image of Ruadh Stac and the lower part of the west face of Blà-bheinn. View is towards the east. S1: Meall Dearg Granite; S2: Ruadh Stac Granite; and, S3: Blaven Granite.

Figure Cuillin 7.31: The lower western side of Blà-bheinn, composed of rusty-brown -weathering Blaven Granite, with the upper part of the mountain dominated by dark layered bytownite gabbros of the Cuillin Intrusive Centre. View is towards the NE.

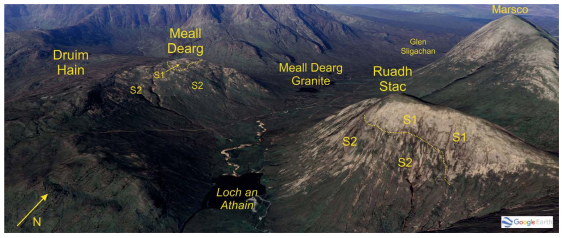

Figure Cuillin 7.32: Annotated oblique Google Earth® image of Meall Dearg, Ruadh Stac and Marsco. View is towards the NW. S1: Meall Dearg Granite; and, S2: Ruadh Stac Granite.

Figure Cuillin 7.33: Ruadh Stac, viewed towards the NE from Druim Hain. The upper part of the hill is composed of Meall Dearg Granite and the lower part of Ruadh Stac Granite.

Continue NW along the path, past Lochan Dubha, to where the western side of Marsco dominates the east side of the glen. This hill is composed of various intrusions, mainly granites, of the Paleocene Western Red Hills Intrusive Centre. The near-vertical face, Fiaclan Dearg ('red teeth'), forms spectacular crags of this granite-dominated hill, with the higher ground formed of the Southern Porphyritic Granite and the lower ground formed of the Marsco Granite.

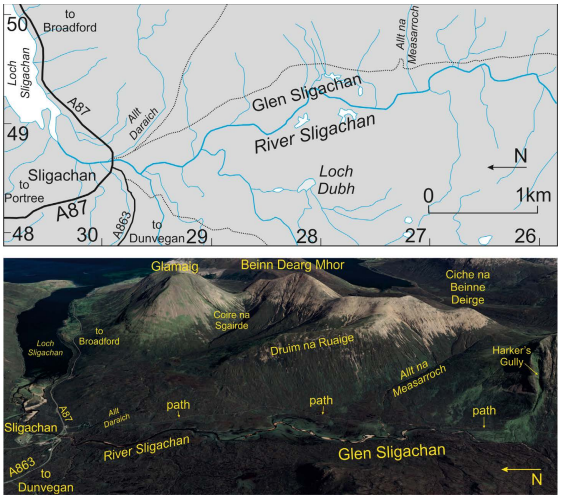

Figure Cuillin 7.34: Route map and an annotated oblique Google Earth® image for the Glen Sligachan part of the excursion.

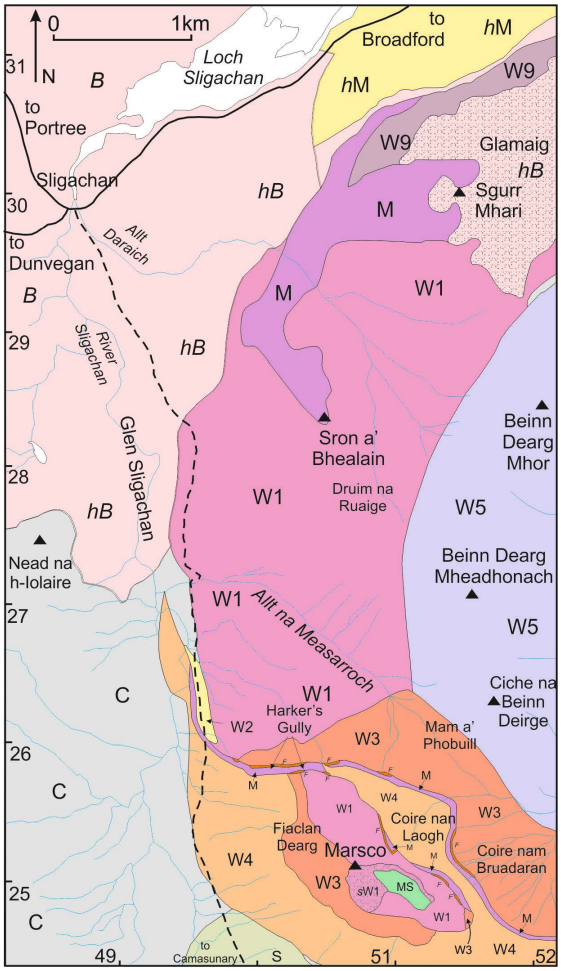

Figure Cuillin 7.35: Summary map of the Marsco area.

Western Red Hills Intrusive Centre

W9	Eas Mor Granite
W5	Beinn Dearg Mhor Granite
W4	Marsco Granite
W3	Southern Porphyritic Granite *F*, felsite marginal facies
W2	Sligachan Granite
W1	Glamaig Granite *s*W1, where stoped into MS
M	Marscoite Suite
MS	Marsco Summit Gabbro

Country-rocks

B	Palaeocene Basaltic lavas, hornfelsed adjacent to intrusions
cB	Palaeocene Basaltic lavas forming cap to intrusive units of Glamaig
S	Srath na Creitheach Intrusive Centre (granite)
C	Cuillin Intrusive Centre (various gabbros)

Figure Cuillin 7.36: Key to summary map of the Marsco area (Figure Cuillin 7.35).

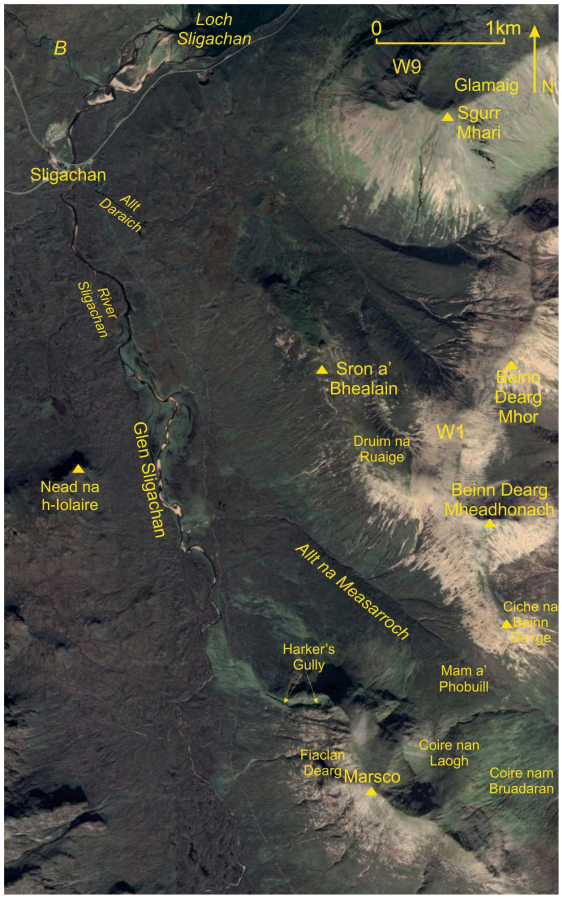

Figure Cuillin 7.37: Annotated Google Earth® image of Glen Sligachan.

On the NW side of Marsco there is a large conspicuous gully, colloquially referred to as Harker's Gully, in honour of Alfred Harker, doyen of igneous geology at the beginning of the 20th Century, who elucidated much of the complex geology of this area. At the base of the gully is a grass-covered outwash fan. The grass is bright green and luxuriant due to the calcium- and phosphorus-rich run-off water which drains from the ferrodiorite intrusion that crops out in the gully.

If time, energy and enthusiasm permits, leave the path at the stream draining the gully and walk uphill to the lowest exposures at the beginning of the gully.

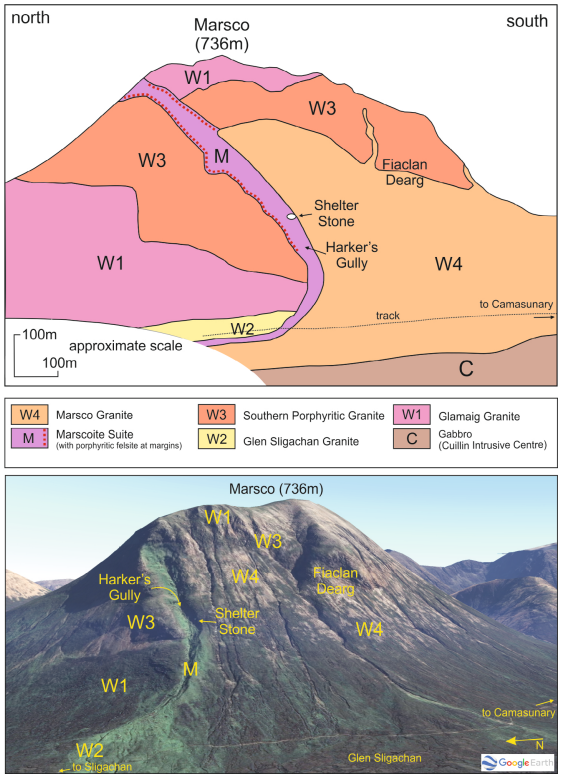

Figure Cuillin 7.38: Schematic representation of the various intrusions that crop out on Marsco and an annotated oblique Google Earth® image of Marsco. View is towards the east.

Figure Cuillin 7.39: Harker's Gully on the NW side of Marsco, defining the outcrop of the Marscoite Suite Ring-dyke.

Figure Cuillin 7.40: Detail of the lower part of Harker's Gully on the NW side of Marsco, defining the outcrop of the Marscoite Suite Ring-dyke. The large projecting rock (the Shelter Stone) on the south (right) side of the gully is composed of ferrodiorite of the Marscoite Suite.

Locality 11 [NG 4992 2586]:

On the north face of the gully, a few metres uphill from the lowest exposures, a large (at least 3m x 2m) xenolith of Lewisian Gneiss crops out. It is a well-banded, amphibolite-facies leucogneiss that has been thermally metamorphosed by the ferrodiorite intrusion that encloses it. Under the microscope, this thermal metamorphism is evidenced by patches of quartz and alkali feldspar in a granophyric intergrowth, together with the development of pyroxene hornfels facies mineral assemblages within the more mafic portions.

Walk up the gully to the overhanging Shelter Stone that projects from the south wall of the gully. *En route,* note the prominent jointing within the Southern Porphyritic Felsite above the north wall of the gully.

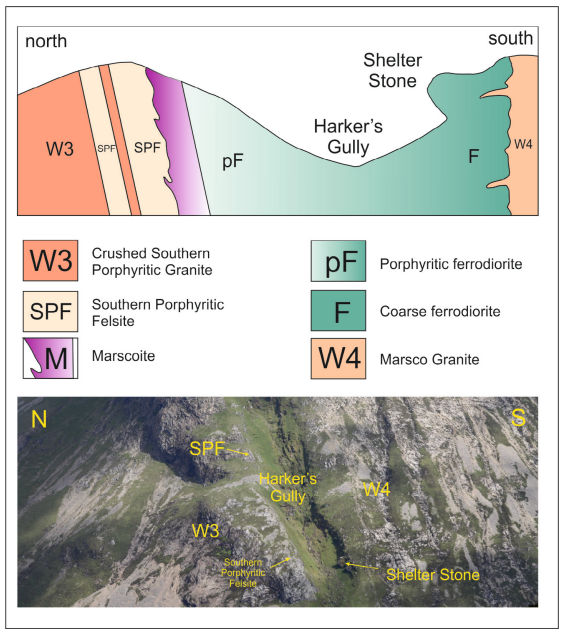

Figure Cuillin 7.41: Schematic cross-section of Harker's Gully at the level of the Shelter Stone and an annotated oblique Google Earth® image of the area. View is towards the east.

Figure Cuillin 7.42: Typical equigranular Marsco Granite in an exposure south of Harker's Gully at the height of the Shelter Stone. Coin *c.*24mm across.

Locality 12 [NG 5010 2581]:

At the level of, and above, the Shelter Stone, members of the Marscoite Suite are clearly exposed.

Figure Cuillin 7.43: The Shelter Stone in Harker's Gully, composed of non-porphyritic ferrodiorite. View is towards the south, across the gully.

The complete section across the gully comprises (from south to north): porphyritic and non-porphyritic (coarse-grained) ferrodiorite; marscoite; and, Southern Porphyritic Felsite.

In a south-to-north traverse of the gully, the following features should be noted:

1. The gradational contact between the coarse-grained, non-porphyritic ferrodiorite and the Marsco Granite (but best seen in the gully *c.* 100m up from the Shelter Stone in the south wall);

2. Coarse-grained, non-porphyritic ferrodiorite on the south side of the gully (the Shelter Stone is composed of this variety of ferrodiorite), which shows onion-skin weathering characteristics and the development of a dark brown soil;

3. Pale, coarse-grained, cognate xenoliths of andesinite (typically less than 2cm across) within the ferrodiorite and best examined in boulders within the stream bed just above the level of the Shelter Stone;

4. The gradational contact between grey marscoite on the north side of the gully and porphyritic ferrodiorite in the middle of the gully;

5. The bulbous, irregular contact between grey chilled marscoite and pale Southern Porphyritic Felsite, best developed sporadically along their mutual boundary on the top of the northern wall of the gully (indicating that the marscoite magma was emplaced after the Southern Porphyritic Felsite magma, but whilst the felsite magma had not completely crystallised);

6. The sharp, but unchilled, contact between the 6m-wide Southern Porphyritic Felsite intrusion and the coarse-grained Southern Porphyritic Granite, just beyond (north of) the northern gully wall.

Figure Cuillin 7.44: Typical non-porphyritic ferrodiorite. Coin *c.* 24mm across.

Figure Cuillin 7.45: Typical weathered ferrodiorite, with onion skin/doleritic/spheroidal (weathering) characteristics. Pole *c.* 1m long.

Figure Cuillin 7.46: Detail of ferrodiorite with onion skin/doleritic/spheroidal weathering characteristics. Coin *c.* 24mm across.

Figure Cuillin 7.47: Boundary between the Southern Porphyritic Granite and the Southern Porphyritic Felsite, north (outside) Harker's Gully, *c.* 100m above the Shelter Stone. The boundary coincides with the change in joint pattern/spacing. Pole is *c.* 1m long and positioned at the boundary.

Figure Cuillin 7.48: Contact between marscoite (grey, right-hand-side of exposure) and Southern Porphyritic Felsite (pale, left-hand-side of exposure), *c.* 100m above the Shelter Stone, north of Harker's Gully. Pole *c.* 1m long.

Figure Cuillin 7.49: Detail of contact between marscoite (grey, right-hand-side of exposure) and brecciated Southern Porphyritic Felsite (pale, left-hand-side of exposure), *c.* 100m above the Shelter Stone, north of Harker's Gully. Coin *c.* 24mm across.

Figure Cuillin 7.50: Detail of contact between marscoite (grey) and Southern Porphyritic Felsite (pale), *c.* 100m above the Shelter Stone, north of Harker's Gully. The non-planar contact is interpreted as evidence for the interaction of the two as magmas. Coin *c.* 24mm across.

Figure Cuillin 7.51: Detail of contact between marscoite (grey) and Southern Porphyritic Felsite (pale), *c.* 100m above the Shelter Stone, north of Harker's Gully. The non-planar contact is interpreted as evidence for the interaction of the two as magmas. Coin *c.* 24mm across.

Figure Cuillin 7.52: Detail of contact between marscoite (grey) and Southern Porphyritic Felsite (pale), *c.* 100m above the Shelter Stone, north of Harker's Gully. The non-planar contact is interpreted as evidence for the interaction of the two as magmas. Coin *c.* 24mm across.

Figure Cuillin 7.53: Typical (grey) marscoite, with xenocrysts of plagioclase, alkali feldspar and quartz, formed by the mixing of Southern Porphyritic Felsite magma and porphyritic ferrodiorite magma. Coin *c.* 24mm across.

Return to the path in Glen Sligachan and continue north towards Sligachan to where it crosses the Allt na Measarroch and proceed upstream to examine good exposures of the Glamaig Granite in the stream bed.

Locality 13 [NG 4951 2721]:

Where the path crosses the Allt na Measarroch, proceed upstream and examine good exposures of the Glamaig Granite in the stream bed. This granite is composed of equigranular crystals of quartz, alkali feldspar and plagioclase, together with hornblende and biotite. It is readily distinguished from other silicic intrusions within the Western Red Hills Intrusive Centre by the presence of numerous small (5–50mm), rounded to sub-angular, mafic inclusions, indicating the mingling and partial mixing of two compositionally-contrasting magmas. Paleocene alkali olivine dolerite dykes of the so-called Beinn Dearg Type intrude this granite and crop out further upstream (400–500m).

Figure Cuillin 7.54: Typical Glamaig Granite, with rounded mafic inclusions. Coin *c.* 24mm across.

Figure Cuillin 7.55: A late-stage alkali olivine dolerite dyke intruded into the Glamaig Granite in the Allt na Measarroch. View is towards the SE, with Marsco in the distance. Iain Allison for scale.

Return to the path and continue north to Sligachan, to the Collie and Mackenzie Sculpture. Two of Skye's pioneer climbers of the 19th Century, Norman Collie (left) and John Mackenzie (right), are celebrated by this dramatic bronze sculpture. Mackenzie, a local man from Sconser, first climbed Sgùrr nan Gillian when aged 10, and Collie, from Manchester, first met in the 1880s and forged a lifetime friendship and love of Skye's alpine peaks. Each has a summit named after them: Sgùrr Thormaid (Collie; 'Norman's Peak') and Sgùrr Mhic Choinnich (Mackenzie). Both are buried at the old graveyard in Struan, in sight of the Cuillins.

The view south, along Glen Sligachan, is one of Skye's most iconic. Take time to enjoy it. Retire to the hotel for a well-earned refreshment.

Figure Cuillin 7.56: The Collie and Mackenzie Sculpture at Sligachan.

End of excursion.