

North Skye 1:

The Portree area



Ben Tianavaig, SE of Portree (Port Rìgh, the King's port or harbour), viewed from Craig Ulatota towards the south across the bay that shelters Portree. This summit is dominated by a tilted sequence of Paleocene lavas that has partially collapsed on its seaward side to produce a large complex landslide. Rotational failure during the Holocene, or possibly towards the end of the Quaternary glaciations, was facilitated by underlying weak Jurassic sedimentary rocks and a Paleocene dolerite sill.

Aspects covered: Paleocene pyroclastic and volcaniclastic deposits; hyaloclastites; subaerial plateau lavas; pillowed lavas; Paleocene dolerite sills; Jurassic sedimentary rocks; Holocene landslips.

This excursion is split into three parts:

1. On the south side of [Loch Portree](#), at [Camas Bàn](#);
2. East of [Portree](#), between [Sgeir Mhòr](#) and [Creag Mhòr](#);
3. The stream bed of the [Lòn Drùiseach](#), 4km (2.5 miles) north of [Portree](#), and the inland crags from [Creag Ulatota](#) to [Fiuranean](#).

Routes:

1. [Penifiler](#) - [Camas Bàn](#) (- return [Penifiler](#));
2. [Portree](#) - [Sgeir Mhòr](#) - [Am Bile](#) - [Creag Mhòr](#) - [Port a' Bhata](#) (- return [Portree](#));
3. Portree-Staffin (A855) road - [Lòn Drùiseach](#) - [Creag Ulatota](#) - [Fiuranean](#) (- return Portree-Staffin (A855) road).

Distances: 1. 2km; 2. 7km; 3. 9km.

Times: 1. 2 hours; 2. 5 hours; 3. 5 hours.

General comments: Parking for all three parts of this excursion is limited. Only Part 1 is (marginally) tide-dependant. For Part 3, a spade may prove to be useful. It is not feasible to complete all three parts in one day; logically, parts 1 and 2 can be completed together in one day.

Excursion North Skye 1: The Portree Area

The town of [Portree](#) is located on the north side of [Loch Portree](#), on the east coast of north Skye. It lies 40km (25 miles) NW of [Broadford](#) on the A87 road.

The geology around [Portree](#) comprises Jurassic strata capped by Paleocene volcanic rocks, mainly lavas, with interbedded sedimentary rocks, all of which dip at a shallow angle towards the west. Paleocene dykes of the NW-SE -trending regional swarm cut these igneous and sedimentary units. The lavas form spectacular coastal cliffs east of [Ben Tianavaig](#), SE of [Portree](#), and east of [Bealach Cumhang](#) and [Sithean a' Bhealach Chumhaing](#), NE of [Portree](#). Locally, large masses of the volcanic sequence have landslipped to the east.

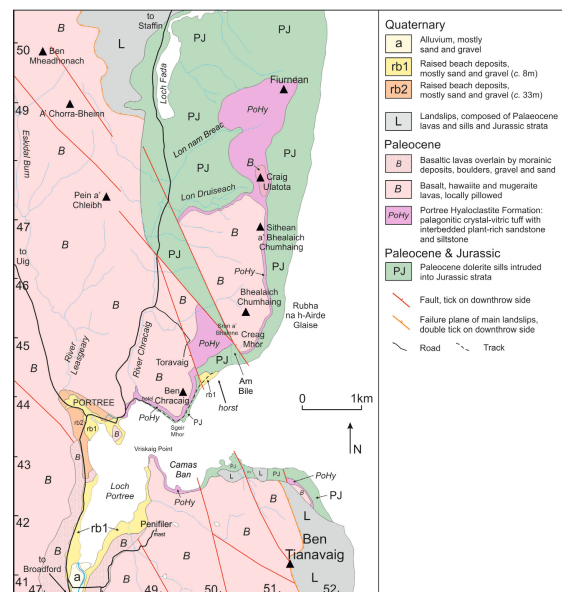


Figure North Skye 1.1: Summary map and annotated Google Earth® image of the Portree area.

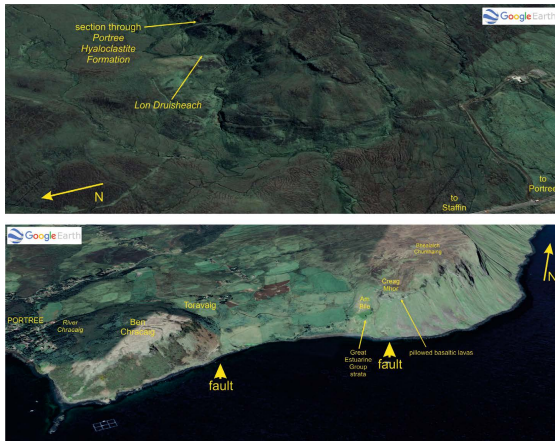


Figure North Skye 1.2: Annotated oblique Google Earth® images of the Portree area.

1. From [Portree](#), follow the main (A87) road south for 2.5km (1.5 miles) to the [Braes \(B883\) road](#), immediately south of [Loch Portree](#). If travelling from [Broadford](#), the [road to Braes](#) is a very sharp right-hand turn-off from the A87 road. Proceed along the B883 road, across the [Varragill River](#), to the [Penifiler turn-off](#) (0.8km (0.5 miles)) and continue to [Penifiler](#) (1.5km (1 mile)). Very limited parking is available near the road-end (which is a turning point only). From the end of the road, walk NE over the step-like trap topography of the plateau lavas, past a prominent cairn approximately mid-way *en route*, to [Camas Bàn](#). Descend the grassy slopes in the middle of the bay to the dark sandy beach.



Figure North Skye 1.3: Camas Bàn, south of Portree. The Portree Hyaloclastite Formation crops out on the west (left-hand) side of the bay. The summit on the far side of the bay is Ben Chraigaig, comprising a sequence of Paleocene basaltic lavas dipping towards the west (left).

Locality 1 [NG 4923 4245]:

On the east side of [Camas Bàn](#), the Paleocene volcanic succession consists of a sequence of hyaloclastites, the Portree Hyaloclastite Formation, intruded by a dolerite sill. The sill is columnar-jointed, with columns typically 30cm across that fan out in an irregular fashion. The hyaloclastite is best examined on the west side of the bay on the wave-cut platform.



Figure North Skye 1.4: Dolerite sill with irregular columnar joints, intruded into Middle Jurassic Berreraig Sandstone Formation strata (locally poorly exposed) on the east side of Camas Bàn. Iain Allison for scale.

Locality 2 [NG 4913 4250]:

The dark, bedded and cross-bedded hyaloclastites on the west side of [Camas Bàn](#) comprises a breccia with large (up to 15cm) angular to sub-angular fragments of various types of basalt (massive, amygdaloidal etc.) set in a dark matrix of lapilli-sized fragments and thoroughly altered (microscopic) fragments of what was originally basaltic glass, now the secondary clay-like material, palagonite. The fine-grained component of these deposits consists of upward-finishing cycles, approximately 20cm thick. The uppermost part of the exposed sequence has been altered to a highly ferruginous laterite. In the crags above the west side of the bay the base of the plateau lava sequence may be examined. The first (lowest) lava is an amygdaloidal basalt that infills minor irregularities in the (underlying) hyaloclastites.



Figure North Skye 1.5: Brown-weathering Paleocene Portree Hyaloclastite Formation on the west side of Camas Bàn, overlain by plateau lavas. Iain Allison for scale.



Figure North Skye 1.6: Brown-weathering Paleocene Portree Hyaloclastite Formation on the west side of Camas Bàn. Note stratification inclined towards the west (right) and the presence of angular to sub-angular fragments (blocks) of basalt. Hammer c. 60cm long.



Figure North Skye 1.7: Detail of brown-weathering Paleocene Portree Hyaloclastite Formation on the west side of Camas Bàn. Note stratification inclined towards the west (right) and the presence of angular to sub-angular fragments (blocks) of basalt. Hammer c. 30cm long.

A Paleocene lignite seam (from 30cm to 1m thick) at the top of the hyaloclastite sequence (directly below the lowest lava) was worked for low-grade coal during the 18th Century, yielding an estimated 500–600 tons (Parish records, reported by John Macculloch in 1819). The partially collapsed entrance to the drift mine may be examined at the base of the crags, although difficult to access, especially in the Summer months when vegetation is high. Above the lignite, the amygdaloidal, rubbly base of the lowest lava grades into, over 1m, crudely jointed dolerite, forming the massive, central portion of the lava.

From here, return to [Camas Bàn](#), and thence to [Penifiler](#).

2. Return (or proceed) to [Portree](#) and follow the route through the town signposting Staffin (A855) to where the [junction to Budhmor](#) is indicated. Follow this minor road down the hill and around the north side of the bay, across the [River Chraçaig](#). Continue for a further c. 200m to where [parking](#) is available on the south side of the road. Follow the prominent footpath SE along the coast,

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past the promontory of [Sgeir Mhòr](#). Note on the south side of Loch Portree, on [Ben Tianavaig](#), that the plateau lava sequence dips at a shallow angle towards the west and, at its eastern extremity along the coast at [Udairn](#), masses of lava have rotated and landslipped eastwards.



Figure North Skye 1.8: Ben Tianavaig viewed towards the south. The main part of the hill is composed of Paleocene basaltic lavas dipping towards the west (right). On the east (left-hand side) of the hill, down to sea-level, is landslipped material, comprising Paleocene basaltic lavas and underlying Middle Jurassic Bearreraig Sandstone Formation strata intruded by dolerite sills.

Locality 3 [\[NG 4933 4348\]](#):

From [Sgeir Mhòr](#), to the NE, a thick Paleocene dolerite sill is exposed along the coast. Proceed NE along the path and cross, via a [small wooden gate](#), a dry-stone wall, beyond which the ground opens out into a [meadow](#). Walk across this gently sloping, cultivated ground, over Middle Jurassic strata, which has a near-identical dip, to just beyond the crags of [Am Bile](#), SW of the base of the [Creag Mhòr](#) cliffs. A few metres east of [Am Bile](#), in the vicinity of a [small stream](#), a fault downthrows the Paleocene volcanic sequence exposed in the cliffs, bringing the contrasting rocks of Paleocene and Middle Jurassic ages into juxtaposition.



Figure North Skye 1.9: Coastal section NE of Portree. The crags of Creag Mhòr on the east (right-hand) side are composed of Paleocene basaltic lavas, underlain (masked by the large apron of scree) by Middle Jurassic Berreraig Sandstone Formation strata intruded by Paleocene dolerite sills. The lower meadow area to the west (left) of Am Bile is composed of Middle Jurassic Berreraig Sandstone Formation strata. At the obvious break in slope between these two sections, at Am Bile, a fault downthrows the volcanic sequence. Based on these relationships, together with the structurally elevated lavas to the west of the meadow (see **Figure North Skye 1.12**), the low-lying area underlain by the Great Estuarine Group strata is interpreted (structurally) as a horst.



Figure North Skye 1.10: The meadow above Port a' Bhata and SE of Toravaig, NE of Portree. Here, Middle Jurassic Berreraig Sandstone Formation strata crop out, producing good pasture. On the far side of this grassy area, forming the rugged coastal crags of Creag Mhòr, with an intervening fault at Am Bile, are Paleocene plateau basaltic lavas.



Figure North Skye 1.11: Detail of the meadow above Port a' Bhata and SE of Toravaig, NE of Portree. Here, Middle Jurassic Berreraig Sandstone Formation strata crop out, producing good pasture. On the far side of this grassy area, forming the rugged coastal crags of Creag Mhòr, with an intervening fault at Am Bile, are Paleocene plateau basaltic lavas.



Figure North Skye 1.12: Reverse view of the meadow above Port a' Bhata and SE of Toravaig, NE of Portree. Here, Middle Jurassic Berreraig Sandstone Formation strata crop out, dipping at a shallow angle to the west. On the far side of the meadow, forming the higher ground, with an intervening fault, are Paleocene plateau basaltic lavas.



Figure North Skye 1.13: Inclined Middle Jurassic Berreraig Sandstone Formation strata at Am Bile, east of Toravaig. These shallow-marine sandstones have well-developed cross-stratification and uncommon layers rich in pebble-grade material. Pole c. 1m long.

Locality 4 [\[NG 5052 4469\]](#):

Follow the lowest exposures of the volcanic rocks on the east side of the small stream for c. 200m, to where the exposed volcanic sequence is dominated by a series of pillowed, plagioclase porphyritic (tholeiitic) basalt lavas (with pillows up to 1m across). For reference, this locality is directly above the point on the beach where the grey pebbles give way to a boulder beach representing the beginning of the shoreline scree from the lava sequence. Individual pillows have ropy surfaces and contain radiating pipe amygdalae of various carbonates. Between and below the pillows are sporadic exposures of hyaloclastite, up to 0.5m thick. The hyaloclastite is dark brown, rich in crystals and glass, and contains amygdalae of zeolite and opaline silica. Below the hyaloclastite are further exposures of amygdaloidal basalt lava.



Figure North Skye 1.14: Creag Mhòr, NE of Portree, composed of Paleocene lavas and (poorly exposed, mainly covered by grass, soil and scree) hyaloclastite. The lowest part of the main cliff is dominated by pillowed lavas, indicative of sub-aqueous eruption.

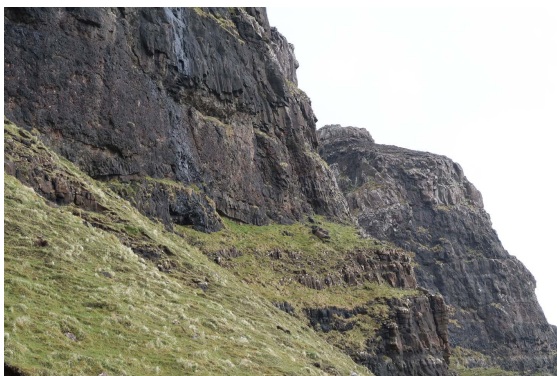


Figure North Skye 1.15: The lower part of the cliffs of Creag Mhòr, NE of Portree, composed of Paleocene lavas. The brown-weathering lowest part of the exposed section, above the grass-covered slope, is dominated by pillowed lavas, indicative of sub-aqueous eruption.



Figure North Skye 1.16: Paleocene pillowed basaltic lavas in lowest exposed part of the Creag Mhòr cliffs, indicative of sub-aqueous eruption. Pole c. 1m long.



Figure North Skye 1.17: Detail of Paleocene pillowed basaltic lavas in lowest exposed part of the Creag Mhòr cliffs, indicative of sub-aqueous eruption. Ruler 30cm long.



Figure North Skye 1.18: Detail of Paleocene pillowed basaltic lavas in lowest exposed part of the Creag Mhòr cliffs, indicative of sub-aqueous eruption. Ruler 30cm long.

Return to [Am Bile](#) and, either, continue across the [meadow](#) back to [Portree](#), or, follow the indistinct path along the immediate foot of the crags below [Am Bile](#). The upper part of these crags consists of Middle Jurassic Bearreraig Sandstone Formation strata: cross-bedded, calcareous sandstones and sandy limestones with layers rich in calcareous concretions ('doggers'). Below these units, at the eastern end of the exposures, are more

massive-bedded sandstones, which give way, downwards, to poorly exposed shales.

This sequence of Jurassic strata, like the overlying lava pile, dips at a shallow angle towards the west and is cut by several vertical, inweathered Paleocene basalt and dolerite dykes that form prominent NW-SE -trending gullies in the rock-face.

Return to the parking area.

3. Proceed north from [Portree](#) on the Portree-Staffin (A855) road for c. 4km (2.5 miles) to where the road crosses the [Lòn Druisheach](#). Very limited parking is available on the east side of the road, c. 250m north of this point, in a small, abandoned, [road-side quarry](#).

From where the road crosses the [Lòn Druisheach](#), walk ESE for c. 900m across open ground to the moraine-filled valley of the [Lòn Druisheach](#), passing under the [large water pipe](#) and, on the north side of a sluice, to the main southern tributary.

Locality 5 [\[NG 4973 4724\]](#):

Approximately 150m upstream from the confluence, on the brown, soil-covered east bank, the basal section of the Paleocene Portree Hyaloclastite Formation is poorly exposed and significantly weathered. The lower part of the sequence is most easily exposed with a spade.



Figure North Skye 1.19: General view of the weathered basal section of the Paleocene Portree Hyaloclastite Formation on the NE side of a tributary of the Lòn Druisheach. Below this pillow breccia is weathered Middle Jurassic Berreraig Sandstone Formation strata with a distinctive yellow-green hue. Pole c. 1m long.



Figure North Skye 1.20: Detail of the weathered Paleocene Portree Hyaloclastite Formation pillow breccia on the NE side of a tributary of the Lòn Druisheach. Pole c. 1m long.



Figure North Skye 1.21: Detail of the weathered Paleocene Portree Hyaloclastite Formation on the NE side of a tributary of the Lòn Druisheach, with a dark fragment of woody material. Ruler 30cm long.

Continue ENE for c. 1km to the N-S -trending inland crags of [Creag Ulatota](#). From here, the view south reveals the cross-sectional view of [Ben Tianavaig](#), SE of [Portree](#), with its landslipped eastern (left-hand side) section composed of disrupted masses of lava, dolerite sill and Middle Jurassic sedimentary rock.

Location 6 [\[NG 5104 4749\]](#) – [\[NG 5149 4915\]](#):

From [Creag Ulatota](#), as far north as [Fiurnean](#), the crags define the outcrop of the Portree Hyaloclastite Formation, formed by eruption of basaltic magma into (shallow) water, and locally with overlying subaerial lavas of the Beinn Edra Formation. There is considerable lateral and vertical variation within the sequence, ranging from coarse-grained, block-rich hyaloclastite, to material of lapilli grade, and locally-developed pillow-dominated facies.



Figure North Skye 1.22: View towards the south along the line of the main inland crags. The most distant crag, Sithean a' Bhealaich Chumhaing (S), is south of Craig Ulatota and has the only trigonometrical point (392m OD) on the crag line. The next nearest crag (left of centre) is Craig Ulatota (C) (364m OD). The end (nearest) crags are composed of lavas (see **Figures North Skye 1.23 and 1.24**). The low crag (middle near ground) is a Paleocene dolerite sill intruded into poorly exposed Middle Jurassic strata that underlie the Paleocene volcanic sequence.



Figure North Skye 1.23: Weathered basaltic lavas overlying the Portree Hyaloclastite Formation in the main Craig Ulatota – Fiurnean crags, north of Craig Ulatota. View is NW towards the inland escarpment of Trotternish, with its highest point, The Storr.



Figure North Skye 1.24: Detail of basaltic lavas overlying the Portree Hyaloclastite Formation in the main Craig Ulatota – Fiurnean crags, north of Craig Ulatota. One of the lowest lavas in the sequence has a well-developed lateritic top.



Figure North Skye 1.25: Breccia in the Portree Hyaloclastite Formation, between Craig Ulatota and Fiurnean. Pole c. 1m long.



Figure North Skye 1.26: Detail of breccia in the Portree Hyaloclastite Formation, between Craig Ulatota and Fiurnean. Ruler 30cm long.



Figure North Skye 1.27: Detail of pillow breccia in the Portree Hyaloclastite Formation, Fiurnean. Ruler 30cm long.



Figure North Skye 1.28: View north from Fuirnean towards the northern end of Trotternish. The obvious crags in the middle ground are formed of a horizontal columnar-jointed Paleocene dolerite sill of the Little Minch Sill Complex, below which is the Middle Jurassic Berreraig Sandstone Formation in Berreraig Bay. The distant promontory is Rubha nam Brathairean.

Return south along the crags to [Creag Ulatota](#) and then west to the [Portree-Staffin \(A855\) road](#).

End of excursion.