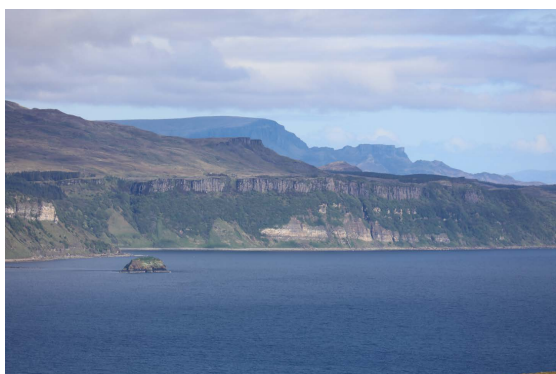


## North Skye 2: Bearreraig Bay



*Bearreraig Bay, on the east coast of Trotternish, is carved out of a thick sequence of Middle Jurassic nearshore marine strata, the Bearreraig Sandstone Formation, overlain by a Paleocene dolerite sill. The large indent in the coast is where the Bearreraig River formed a multi-step waterfall, now dry due to the diversion of the river to a hydroelectric scheme built and commissioned in the early 1950s. The water source is the Storr Lochs, Loch Fada and Loch Leathan, perched inland on Middle Jurassic strata intruded by Paleocene sills. One of these sills forms the obvious columnar-jointed top to the sea cliff.*

**Aspects covered:** Middle Jurassic shallow marine sedimentary rocks of the Bearreraig Sandstone Formation; a Paleocene dolerite sill.

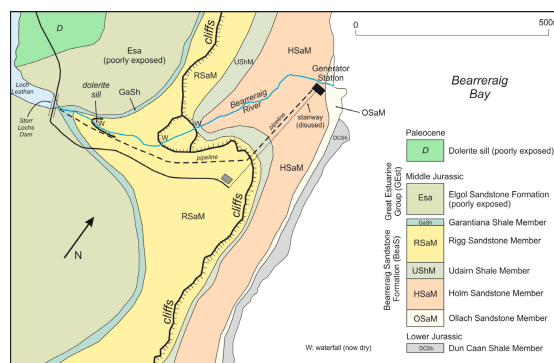
**Route:** [Storr Lochs Dam](#) - [Bearreraig Bay](#) - [Bearreraig River](#) (- return [Storr Lochs Dam](#)).

**Distance:** 4 kilometres.

**Time:** 4-5 hours.

**General comments:** Coastal exposures are involved for localities 1 and 2, therefore low tide conditions are essential. The route down to the coast in the bay is accessed by a relatively steep (but good) path beside the two large waterpipes of the hydroelectric scheme. The concrete staircase beside the waterpipes is no longer available for access to the coastline.

Take the Portree-Staffin (A 855/835) road 9km (c. 6 miles) north to [Loch Leathan](#) and then the [minor road](#) (opposite [Bearreraig Cottage](#)), east, to the [Storr Lochs dam/viaduct](#). Parking is available on the west side of the road on the north side of the dam/viaduct. There is no parking at the end of this minor road.



**Figure North Skye 2.1:** Summary map, key and annotated Google Earth® images of Bearreraig Bay.

From the [Storr Lochs Dam](#) parking area, walk SE over the [Storr Lochs dam/viaduct](#) to the south side of the (now dry/diverted) [Bearreraig River](#). Head east to the buildings at the end of the road and descend the path that zig-zags down to the shore, parallel to the pulley railway and (now) disused concrete stairway, past the [generator house](#) to the [outlet of the river](#). The drop in water height of c. 136m enables c. 2.4MW of electricity to be produced from new turbines that were installed in 2017. The infrastructure was constructed in the early 1950s and started generating electricity on 31<sup>st</sup> May 1952.





Figure North Skye 2.2: Storr Lochs dam/viaduct.



Figure North Skye 2.6: Twin pipes of the Storr Lochs hydroelectric scheme.



Figure North Skye 2.3: Storr Lochs dam/viaduct.



Figure North Skye 2.7: Twin pipes of the Storr Lochs hydroelectric scheme.

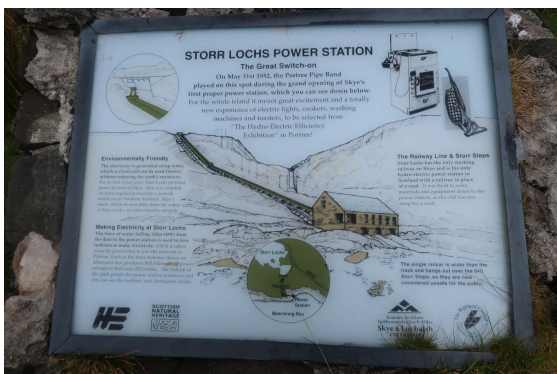


Figure North Skye 2.4: Information board for the Storr Lochs Power Station.



Figure North Skye 2.8: Generator house of the Storr Lochs hydroelectric scheme.



Figure North Skye 2.5: Information board for the geology of Bearreraig Bay.

From the generator station, it may be noted that the cliffs around the bay are composed of the Middle Jurassic nearshore marine Bearreraig Sandstone Formation, capped by a Paleocene prismatic-jointed dolerite sill. [Holm Island](#), to the SE, comprises a remnant of another dolerite sill.





**Figure North Skye 2.9:** Berreraig Bay, viewed towards the north. The vegetation-covered cliffs are composed of Middle Jurassic Berreraig Sandstone Formation strata, capped by a Paleocene dolerite sill.

The following members of the shallow marine Berreraig Sandstone Formation are recognised within the locally-exposed sequence (thicknesses approximate) and boundaries can be gradational:

**[TOP]**

**Rigg Sandstone Member:**

Coarse gritty sandstone with comminuted shell debris (c. 5m). Alternating bands of dark grey, shaly sandstone and medium grey, sandy limestone in beds 0.6m to 1m thick in the lower part and 0.3 to 0.6m thick in the upper part (c. 65m)

**Holm Sandstone Member:**

Soft, white sandstone with calcareous concretions ('doggers'), typically less than 1m in largest dimension, and lenticles of calcareous sandstone, becoming darker towards the base (c. 35m)

**Udairn Shale Member**

Soft, dark grey, shaly sandstones with nodules of grey, sandy limestone. Beds of harder rock, 0.6 to 1m thick, occur in the upper part (c. 70m)

**Ollach Sandstone Member:**

Thinly bedded, calcareous sandstones. Massive, soft, yellow-brown sandstone with concretions and lenticles of calcareous sandstone. Thin-bedded calcareous sandstones with shaly partings (c. 15m)

**Dun Caan Shale Member:**

Dark grey, sandy shales with furoid marks and concretions of sandy limestone (c. 15m)

**[BASE]**

Essentially, there are three major coarsening-up cycles within the formation, representing major influxes of sediment delivered into the basin. The first cycle involves the Dun Caan Shale Member, with the shales coarsening up into silty and sandy limestones at the base of the Ollach Sandstone Member, followed by more massive yellow sandstones with calcareous concretions. These strata are exposed on the foreshore and low cliff south of the Berreraig River outflow.

The second cycle is from the base of the Udairn Shale Member, comprising shales with concretions, which become more silt-rich up sequence, then into fine-grained sandstones in the lowest part of the Holm Sandstone Member. The main exposures of these sandstones are in the cliffs immediately south of Berreraig Bay and in the Berreraig River, up to the main

waterfall (now dry) and have large-scale cross stratification.

The third cycle starts at the base of the Rigg Sandstone Member, grading up to the top of the member, which is a coarser-grained, cross-bedded sandstone rich in shell debris. These strata occur in the upper part of the Berreraig River section, up to the foot of the dam.

**Locality 1 [NG 5185 5258]:**

On the shore, c. 200m south of where the [Berreraig River](#) flows into the Sound of Raasay, below the high-water line, the Dun Caan Shale Member crops out. These fine-grained sedimentary rocks contain large concretions of sandy limestone. Small-scale coarsening upwards cycles (soft dark shale into pale silty shale) are recognised in the small ledges that form these coastal exposures, typically up to 2m. Bioturbation is common. Fossils include belemnites, and bivalves in life position. Fragments of driftwood are also present but are not common.



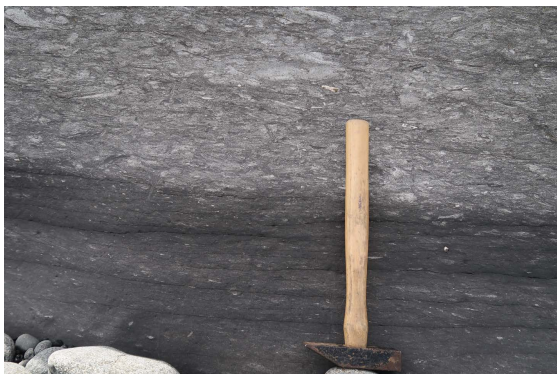
**Figure North Skye 2.10:** Dun Caan Shale Member forming the rock platform, south side of Berreraig Bay. Iain Allison for scale. View is towards the north.



**Figure North Skye 2.11:** Thin coarsening upwards shale-siltstone sequences within the Dun Caan Shale Member forming the rock platform on the south side of Berreraig Bay. Pole c. 1m long.



**Figure North Skye 2.12:** Detail of thin coarsening upwards shale-siltstone sequences within the Dun Caan Shale Member, south side of Berreraig Bay.



**Figure North Skye 2.13:** Coarsening upwards transition between shale and bioturbated siltstone within the Dun Caan Shale Member, south side of Berreraig Bay. Hammer c. 30cm long.



**Figure North Skye 2.14:** Detail of bioturbated siltstone within the Dun Caan Shale Member, rock platform south side of Berreraig Bay. Coin c. 20mm cross.

Paleocene dykes of the NW-SE -trending regional swarm form conspicuous features on the rock platform.



**Figure North Skye 2.15:** NW-SE -trending Paleocene dolerite dyke within the Dun Caan Shale Member on the rock platform on the south side of Berreraig Bay. View is towards the SE.

The Ollach Sandstone Member may be examined in the small cliff above the foreshore. Fallen blocks from higher stratigraphic units (many of which are fossiliferous) may be examined on the beach.

**Locality 2 [\[NG 5186 5245\]](#):**

Approximately 300m south of where the [Berreraig River](#) flows into the Sound of Raasay, the gradational boundary between the Dun Caan Shale Member and the overlying Ollach Sandstone Member can be examined in detail. In the lower part of the sandstone and micritic limestone sequence, four shale layers contain abundant ammonites (*Graphoceras*). Other fossils present in the Ollach Sandstone Member include bivalves, gastropods, belemnites, crinoid ossicles, and fossil drift wood. The remainder of the sequence in the vertical cliffs shows prominent layers of calcareous concretions, varying in size along strike, with typical sizes up to 50cm long and 20cm thick/wide. Larger examples are present.



**Figure North Skye 2.16:** The Ollach Sandstone Member, with abundant calcareous concretions, immediately above the tidal rock platform, south side of Berreraig Bay.





**Figure North Skye 2.17:** Detail of calcareous concretions within the Ollach Sandstone Member, immediately above the tidal rock platform, south side of Berreraig Bay. Pole c. 1m long.



**Figure North Skye 2.18:** Fossil driftwood and organic debris within the Ollach Sandstone Member, immediately above the tidal rock platform, south side of Berreraig Bay. Hammer c. 30cm long.



**Figure North Skye 2.19:** Mineralised belemnite within the Ollach Sandstone Member, immediately above the tidal rock platform, south side of Berreraig Bay. Coin c. 20mm across.

Return to the [Berreraig River](#) and proceed upstream, on the north bank, to the first bend, c. 30m west of the [generator house](#).

**Locality 3 [\[NG 5166 5275\]](#):**

Here, the Udairn Shale Member (17m above the base of the unit – the base is not exposed) may be examined. The

dominant lithology is soft dark shale with discrete carbonate concretions, and bands that are essentially joined up concretions. These siderite concretions formed prior to any significant compaction. Fossils are not common, but include ammonites (*Graphoceras*), belemnites, and fragments of driftwood.



**Figure North Skye 2.20:** Udairn Shale Member on the north side of the Berreraig River, between the coast and the lower cascades. Pole c. 1m long.



**Figure North Skye 2.21:** Detail of the Udairn Shale Member on the north side of the Berreraig River, between the coast and the lower cascades. Hammer c. 30cm long.

Continue upstream through poorly exposed Udairn Shale Member strata that forms small cascades below the main waterfall.

**Locality 4 [\[NG 5155 5254\]](#):**

At the base of the main waterfall, the Udairn Shale Member is exposed, passing upwards, gradationally, into the Holm Sandstone Member. Two to three metres below the top of the Udairn Shale Member are ammonite-rich beds of shale.





**Figure North Skye 2.22:** Upper part of the Udairn Shale Member with elongate calcareous concretions, below the main waterfall.



**Figure North Skye 2.25:** Concretion-rich layers within the Holm Sandstone Member in the face of the main (now dry) waterfall. Iain Allison for scale.



**Figure North Skye 2.23:** Gradational transition at the base of the main waterfall face between the underlying dark Udairn Shale Member and the overlying Holm Sandstone Member. Pole c. 1m long.



**Figure North Skye 2.26:** Concretion-rich layer within the Holm Sandstone Member in the face of the main (now dry) waterfall. Pole c. 1m long.

To gain the highest ground, proceed carefully along the recess behind the main (now dry) waterfall and up the gully on the SE bank of the river.

**Locality 5 [NG 5151 5244]:**

From the top of the main waterfall, up to the upper waterfall, the lower part of the Rigg Sandstone Member crops out, consisting of alternating beds of shaly sandstone (c. 75cm thick) and calcareous sandstone, with gradational lower and upper boundaries. Continue to the top (lip) of the upper waterfall, via the SE bank, and rejoin the river course. 5m back from the waterfall lip is the mould of an ammonite, 30cm in diameter. Continue upstream to the Storr Lochs Dam over a 4m-thick dolerite sill which forms a small waterfall and is partially obscured by trees and shrubs.



**Figure North Skye 2.24:** Randomly oriented fragments of belemnites in the Holm Sandstone Member. Hammer c. 30cm long.

Behind and above the main (dry and accessible) waterfall is a large, weathered-out recess in the Holm Sandstone Member. The Holm Sandstone Member is pale yellow, with a limonitic cement, and contains abundant concretions of calcareous sandstone and sandy limestone, together with carbonaceous fragments. The lower part of the member is bioturbated. This rock is best examined in the recess and is most easily approached from the NW bank.





**Figure North Skye 2.27:** Rigg Sandstone Member forming the upper (now dry) waterfall, comprising alternating beds of shaly sandstone and calcareous sandstone.



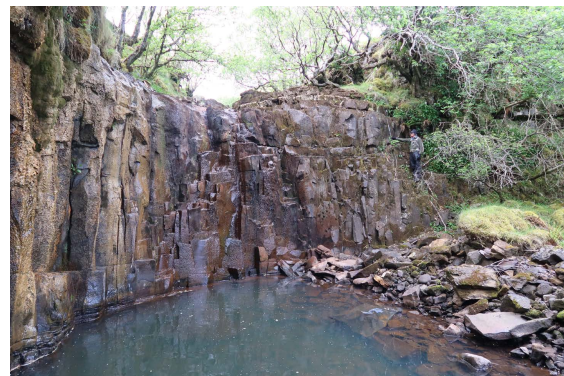
**Figure North Skye 2.28:** Rigg Sandstone Member along strike from the Berreraig River section, comprising alternating beds of shaly sandstone and calcareous sandstone.



**Figure North Skye 2.29:** Mineralised belemnite within the Rigg Sandstone Member, above the upper (now dry) waterfall. Coin c. 20mm across.



**Figure North Skye 2.30:** Mould of an ammonite c. 30cm in diameter, 5m back from the lip of the upper (now dry) waterfall within the Rigg Sandstone Member. Hammer c. 30cm long.



**Figure North Skye 2.31:** 4m thick prismatic-jointed Paleocene dolerite sill within the Rigg Sandstone Member, below the Storr Lochs Dam. Iain Allison for scale.

Continue up to the base of the Storr Lochs Dam.

**Locality 6 [NG 5128 5239]:**

The upper part of the Rigg Sandstone Member, consisting of coarse calcareous sandstones, crops out at the base of the Storr Lochs Dam. These sandstones are thinly bedded, commonly cross-bedded, and contain comminuted shell debris (of unrecognisable fossils).



**Figure North Skye 2.32:** Coarse-grained sandstone within the Rigg Sandstone Member above the dolerite sill. Pole c. 1m long.

Return to the parking place.

End of excursion.