
Excursion 7 Traligill and Bealach Traligill

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Purpose: To study the thrust structures of the Traligill and Breabag imbricate systems and the Ben More Thrust ramp below Conival, in the Assynt Culmination.

Aspects covered: Thrust exposures, lateral ramps, klippen, large-scale thrust structures in the Breabag Dome and the Ben More Thrust, late faults.

Maps: OS: 1:50,000 Landranger sheet 15 Loch Assynt; 1:25,000 Explorer sheet 442 Assynt and Lochinver. BGS: 1:50,000 special sheet, Assynt.

Terrain: The first part of the excursion follows a good path to Cnoc nan Uamh. To the top of Cnoc nan Uamh and beyond to Bealach Traligill, the route goes over rough and boggy ground, generally without a path. To appreciate the geology and to navigate, good visibility is required for the part of the excursion beyond Cnoc nan Uamh.

Time: The excursion all the way to Bealach Traligill involves some 15 km of walking, much of it over rough ground, and is a full day for a fit group. In poor weather, only the half-day excursion as far as Cnoc nan Uamh (Locality 7.5) is recommended.

Access: There are no constraints on access for this excursion, but during the stalking season (July to November) it is advisable to contact Assynt Estates before setting out.

Localities 7.1 and 7.2 can also be visited as part of Excursion 8 (Conival).

Park in the large public car-park at the Inchnadamph Hotel [NC 251 216], with an interpretation panel pointing to the Peach and Horne monument on the far side of the road. From the car-park, turn right onto the main road and then right again on a track past Inchnadamph Lodge and a group of cottages. Pass through a gate and continue along the track to a drystone wall.

Locality 7.1 Durness Group dolostone outcrops. [NC 2561 2189] to [NC 2671 2140]

Around [NC 2561 2189] the track passes outcrops of pale grey dolostone of the Eilean Dubh Formation, with well-developed clints and grykes formed by karstic weathering. The beds here have a dip of c.35° to the east, much steeper than the 'Foreland dip' of 10–12° west of Inchnadamph. In this area the dolostones have been deformed by thrusting into a series of imbricates, recognisable by the presence of repeated ridges and hollows that strike roughly north–south (Figure 52). The Sole Thrust is situated just west of Inchnadamph Lodge, but is not exposed.

Continue eastwards along the track, which crosses the stream, and then climbs up to the cottage at Glenbain. Between Glenbain and a shed at [NC 2671 2140] the path follows NW–SE striking, steeply dipping beds of the Ghrudaidh Formation. The heather-covered slopes above and to the left of the path are underlain by the Pipe Rock Member with the same orientation. These beds form the steep limb of the NW–SE striking Poll an Droighinn Anticline (Bailey, 1935), which was probably formed above a zone of imbricate thrusting that is not exposed.

Locality 7.2 View of the Traligill Thrust. [NC 2693 2112]

Continue up the track to the corner of the conifer plantation, where NW–SE-striking beds of Eilean Dubh Formation crop out. The main interest of this stop is the view across the (usually dry) River Traligill to the south. Just above the river-bed, on its south side, is a long continuous cliff of dark grey dolostones of the Ghrudaidh Formation, passing up into pale grey outcrops of the Eilean Dubh Formation on the slope above. However, pale grey Eilean Dubh Formation dolostones are also exposed on the slope between the track and the river-bed, dipping down beneath the dark grey cliffs. The Ghrudaidh

Formation in the cliffs is thrust over the Eilean Dubh Formation along the Traligill Thrust, which follows the river-bed in this area and is exposed at Locality 7.3. The Traligill Thrust is an oblique lateral ramp (roughly parallel in strike to the WNW transport direction) that also serves as the floor thrust of the Stronchrubie imbricates to the south (Figure 52).

Continue up the path, and to continue with Excursion 7 keep right at the path junction at [NC 2706 2104]. Rather than crossing the small footbridge, turn right and follow the river bank downstream for about 100 m to the Lower Traligill Cave.

Locality 7.3 Lower Traligill Cave. [NC 2706 2089]

Lower Traligill Cave is one of the major sinks within the Traligill drainage system, and thus the river-bed below it is usually dry, providing excellent exposures of the Traligill Thrust. Dark grey dolostones of the Ghrudaidh Formation to the south-west are thrust over pale grey rocks of the Eilean Dubh Formation to the north-east (Figure 53). The thrust plane is exposed in the river-bed as a weathered dip slope of Eilean Dubh Formation dolostone. The Lower Traligill Cave itself is developed in the Ghrudaidh Formation above the Traligill Thrust, and exhibits some hangingwall folding. In very wet weather this sink becomes a resurgence, draining part of an underground plumbing system between the Traligill and the Cnoc nan Uamh caves (see below).

Return to the footbridge, noting the occurrence of duplex structures in Durness Group dolostones in the tributary stream that feeds the River Traligill. Cross the footbridge and follow the path towards Cnoc nan Uamh. Around the base of this low hill are further examples of caves (Figure 54) developed in the Ghrudaidh Formation just above the Traligill Thrust plane, one of which has a partially collapsed roof; great care should be taken around these caves. Brick-red intrusions of peralkaline rhyolite can be seen within the dolostones in this area. After visiting the caves, leave the path and climb the steep north-western slopes of Cnoc nan Uamh.

Locality 7.4 Cnoc nan Uamh Klippe. [NC 2765 2047] to [NC 2767 2046]

The low hill of Cnoc nan Uamh represents a small klippe, floored by the Cnoc nan Uamh Thrust. Approximately 10 m below the top of the Cnoc nan Uamh plateau, on the north-western side, is a small, 1 m high outcrop of the Salterella Grit Member, dipping at about 35° to the east. Above it on the slope is a small outcrop of the Fucoïd Beds Member, and above that a small cliff of the Pipe Rock Member. The Fucoïd Beds are locally folded. Further left (to the north-east) another east-dipping layer of Fucoïd Beds can be seen, on a steep and rather treacherous slope. These outcrops form part of a set of imbricate thrusts involving the Pipe Rock, Fucoïd Beds and Salterella Grit members, which root into the Cnoc nan Uamh Thrust. This thrust in turn overlies the Durness Group dolostones, exposed at the caves below, which lie within the Traligill–Stronchrubie thrust system (Figure 52). As a multitude of thrusts involving Pipe Rock occur further east, it is unclear as to which main thrust the Cnoc nan Uamh Thrust can be linked.

Continue climbing upward and eastward to the summit plateau of Cnoc nan Uamh.

Locality 7.5 The summit of Cnoc nan Uamh. [NC 2778 2048]

The summit of Cnoc nan Uamh offers an excellent viewpoint from which to study the thrust systems of central Assynt, including the Ben More Thrust and the thrusts underneath it. To the north is a frontal view of the Beinn an Fhurain Thrust, which emplaces Basal Quartzite Member over Pipe Rock Member. Higher up on the slope, the Beinn Uidhe Thrust emplaces Basal Quartzite over Basal Quartzite.

To the east is the west face of Conival, with its dark, castellated south ridge composed of Torridon Group sandstone, which is underlain by the Ben More Thrust.

To the ESE is Bealach Traligill, with north-dipping slabs of quartz arenite on its south side. These are part of the gently north-plunging Breabag Dome, which can be seen to the south-east. It consists of thick slabs of Pipe Rock Member (with minor Basal Quartzite Member) that have been thrust over each other to form a broad dome. To the south, on Cnoc Eilid Mhathain, are white dip slopes of Eilean Dubh Formation dolostone, which dip east towards the foreland. These form the

frontal part of the Breabag antiformal thrust stack (Figure 55).

To the SSW is the broad, brown hill of Beinn nan Cnaimhseag. The top part of this hill is composed of Torridon Group sandstone; this hill is interpreted to be a klippe of the Ben More Thrust Sheet, which was folded over the Breabag Dome.

On a large scale, Glen Traligill separates two very different areas within the Assynt Culmination. To the north are thick thrust sheets containing Lewisian gneisses, whereas to the south are thinner thrust sheets of Ardvreck and Durness groups. The Traligill Thrust functions as an oblique transverse zone between these two domains (Krabbendam and Leslie, 2010).

If a shorter excursion is required, the summit of Cnoc nan Uamh is the best place to turn back and retrace your steps. Otherwise, to continue the excursion, cross the boggy summit plateau of Cnoc nan Uamh in a south-easterly direction, passing scattered outcrops of Pipe Rock Member, towards a dry river-bed at [NC 2799 2020]. Follow the stream-bed upstream towards the south. At a junction in the stream, follow the left-hand fork, the Allt a' Bhealaich. Continue past a waterfall at [NC 2829 1984]. As the valley becomes steeper and narrower, climb onto the left (north) bank and continue over boggy ground. Keep the stream on your right hand until a dog-leg in the stream is reached.

Locality 7.6 Pipe Rock Member in the Breabag Dome. [NC 2895 1995]

Around the sharp dog-leg in the Allt a' Bhealaich are good outcrops of the Pipe Rock Member, which dip c.40° to the WNW. In contrast, some 50 m to the north, the Pipe Rock dips gently northwards. These outcrops are in the north-plunging hinge zone of the Breabag Dome, which plunges underneath the Beinn an Fhurain Thrust further north. Above here, the deep NW–SE trending cleft of the Allt a' Bhealaich follows the later Bealach Traligill Fault. Despite this impressive topographical expression, the Bealach Traligill Fault only has some 100–120 m sinistral displacement, and the higher thrusts can be relatively easily traced across the fault.

Continue on a bearing of 80° (aiming towards the summit of Conival), climbing steps of Pipe Rock and crossing a grassy area, keeping boggy ground to your right hand side. Follow a small stream as far as [NC 2914 2002] where a faint path crosses the stream, about 50 m before a dog-leg. Turn right (south-east) and follow the faint path in the direction of the Bealach Traligill, with a bog to the right and a steep slope of Basal Quartzite to the left. In front is a vast dip slope of Pipe Rock, gently curved around the north-plunging hinge zone of the Breabag Dome. The steeper cliff above, forming the top of Breabag Tarsuinn, is composed of Pipe Rock and Basal Quartzite members, with a thrust beneath.

Keep following the path to the south-east until the Allt a' Bhealaich is reached again near [NC 2967 1946]. Follow the path up along the stream and through the impressive cleft of the Bealach Traligill Fault. Note the fractured quartz arenites on either side of the gorge (Figure 56). Keep climbing until the path levels out on the north-west side of the Bealach Traligill.

Locality 7.7 Outcrops on the north-east side of the Bealach Traligill Fault. [NC 2992 1937]

To the left of the stream, and north-east of the Bealach Traligill Fault, are outcrops of steeply north-west-dipping Fucoid Beds Member, overlying Pipe Rock Member. Dolostone of the Ghrudaidh Formation is exposed some 60 m further to the north-east; the intervening Salterella Grit Member is not exposed here, but can be seen further north. Continue towards the Bealach Traligill to a large boulder of conglomerate.

Locality 7.8 Bealach Traligill. [NC 3018 1921]

A number of interesting features can be seen at this usually very windy locality.

A large (5 m boulder of coarse conglomerate attests to the presence of basal Torridon Group sandstone (Diabaig Formation) on the castellated south ridge of Conival, from whence it has fallen. Note the large proportion of clasts of vein quartz, which reflect the very long period of weathering of the Lewisian landscape, prior to deposition of the Diabaig

Formation.

Just to the south-west of the boulder are outcrops of the Furoid Beds Member, dipping steeply to the north-west. These can be correlated with the Furoid Beds on the other side of the Bealach Traligill Fault at Locality 7.7, thus constraining the movement along the fault to c.120 m of sinistral displacement.

Looking back to the NNW, a shallow hollow can be seen on the slope of Conival, just above Locality 7.7. This hollow marks the position of the Beinn an Fhurain Thrust, which emplaces Pipe Rock Member on Conival over the Ghrudaidh Formation of Locality 7.7.

From here, leave the path and climb the slope obliquely due south to a viewpoint on the slopes of Breabag Tarsuinn.

Locality 7.9 Breabag Tarsuinn. [NC 3020 1904]

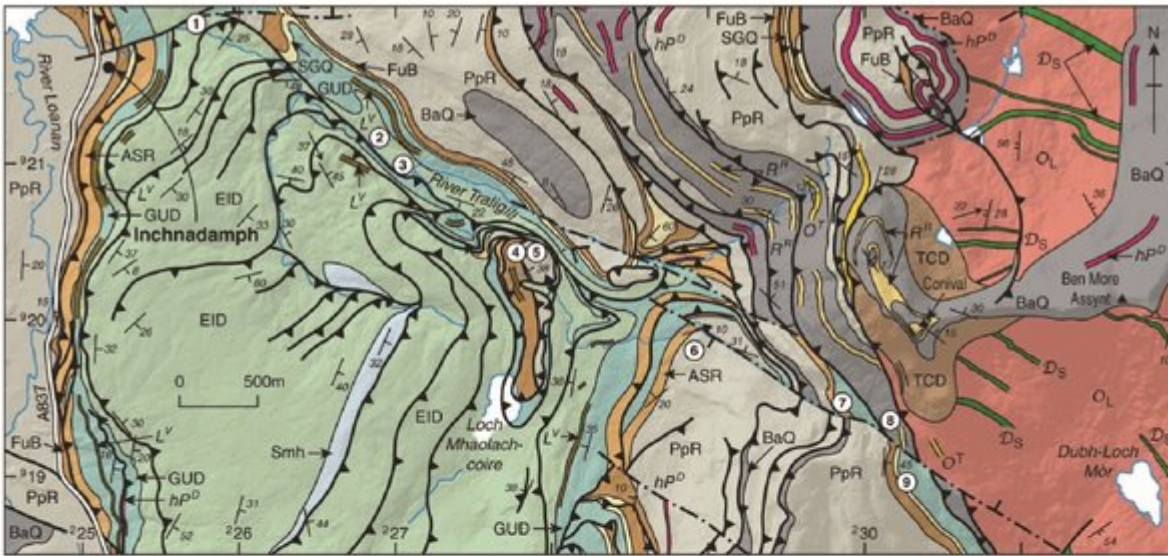
At this point, steeply dipping Salterella Grit Member is exposed. To the north is the south ridge of Conival, composed of Torridon Group conglomerate and sandstone. Below that ridge, in the Garbh Coire, is the unconformity between Torridon Group sandstones and Lewisian gneiss.

The Ben More Thrust runs below the ridge and dips steeply towards the east (Figure 57). Note that the Ben More Thrust descends steeply from a height of about 900 m almost at the top of Conival, to the Bealach Traligill at about 500 m. A thin sliver of pale-weathering, highly sheared Lewisian gneiss occurs just above the Ben More Thrust and below the Torridon Group. This occurrence can be explained in two ways. Butler (1997) argued that the bedding in the Torridon Group abuts against the Lewisian gneiss at a high angle, and that the contact is a Precambrian normal fault. An alternative view is constrained by the fact that just above the Lewisian gneiss–Torridon Group contact there is a tight anticline–syncline pair within the Torridon Group, similar to folds that occur further south on Sgonnan Mòr (Johnson and Parsons, 1979). This would suggest that the Lewisian gneiss–Torridon Group contact is an unconformity, highly modified by thrusting and associated folding and shearing along the Ben More Thrust.

To the ESE, note the deep cleft of the Bealach Traligill on the south-east side of Garbh Coire. To the south is the glacially gouged Glen Oykel. On the east side of Glen Oykel are low cliffs of Torridon Group sandstone and Basal Quartzite Member, in the hangingwall of the Ben More Thrust. The Ben More Thrust crosses the valley and reappears on Sgonnan Mòr to the south. Part of the western side of Glen Oykel is formed of large east-dipping dip slopes of quartz arenite, which form the trailing edge of the Breabag Dome. Some of these dip slopes show spectacular landslips.

From here, retrace your steps to Inchnadamph. Do not be tempted to take a shortcut toward the upper part of the Traligill River; the descent is steep and dangerous.

[References](#)



- Caledonian Igneous Intrusions**
- R^R Peralkaline Rhyolite
 - hP^D Hornblende Microdiorite
 - L^V Vogesite
 - O^T Porphyritic Trachyte
- Durness Group**
- Smh Sailmhor Formation
 - EID Eilean Dubh Formation
 - GUD Ghrudaidh Formation

- Ardreck Group**
- ASR An t-Sròn Formation (undivided)
 - SGQ Salterella Grit Member
 - FuB Fucoid Beds Member
 - PpR Pipe Rock Member
 - BaQ Basal Quartzite Member
- Torridon Group**
- TCD Diabaig Formation
- Lewisian Gneiss Complex**
- D_S Scourie Dyke Swarm: metadolerite
 - O_L Orthogneiss

- Geological boundary, bedrock
- - - Fault at rockhead, crossmark on downthrow side, where known
- ▲ Thrust, bars on hanging wall side
- 45° Inclined strata, dip in degrees
- 44° Inclined gneissose foliation, dip in degrees
- 6° Plunging lineation, plunge in degrees

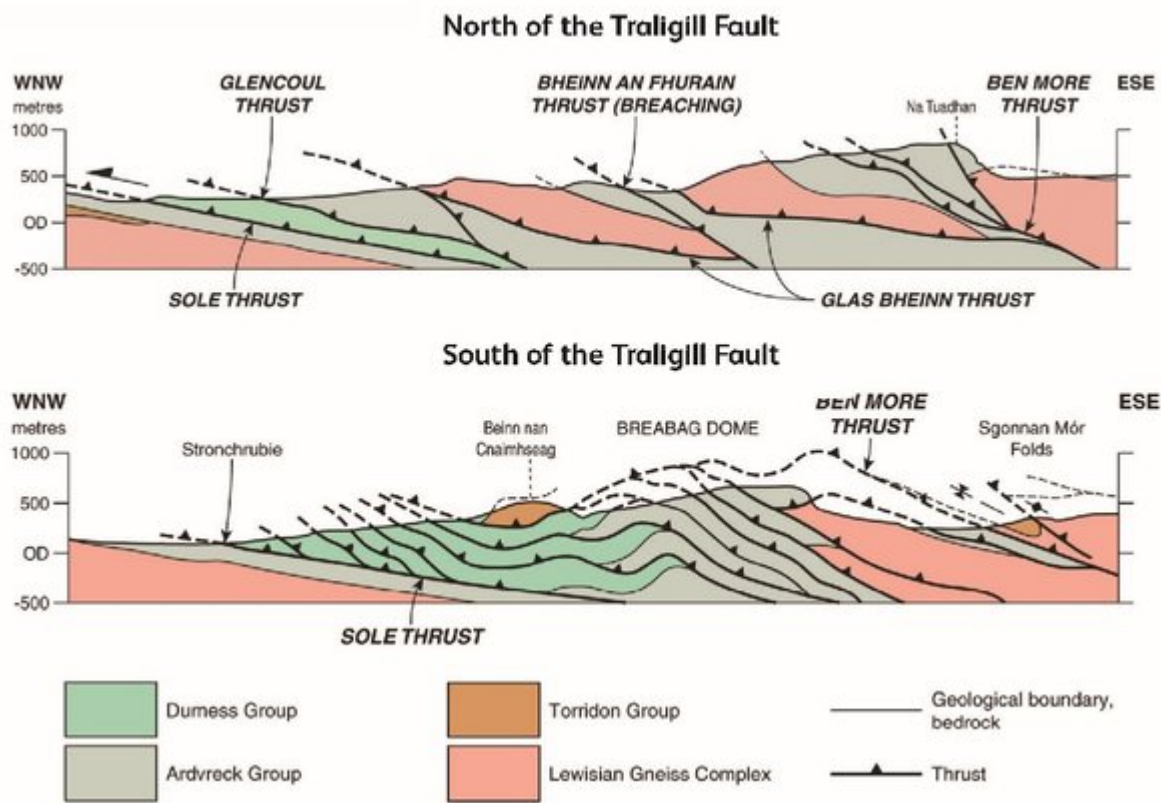
(Figure 52) Simplified geological map of the area around Glen Traligill, after British Geological Survey (2007), showing the localities described in Excursion 7.



(Figure 53) The Traligill Thrust in the river-bed below Locality 7.3. Dark grey Ghrudaidh Formation dolostones are thrust over pale grey Eilean Dubh Formation dolostones. (BGS photograph P530634, © NERC)



(Figure 54) Cnoc nan Uamh from the west. On the lower slopes are caves formed in Durness Group carbonates; the crags on the top of the hill are exposures of the Ardvreck Group within the Cnoc nan Uamh Klippe (Locality 7.4). (Photograph: © K. M. Goodenough)

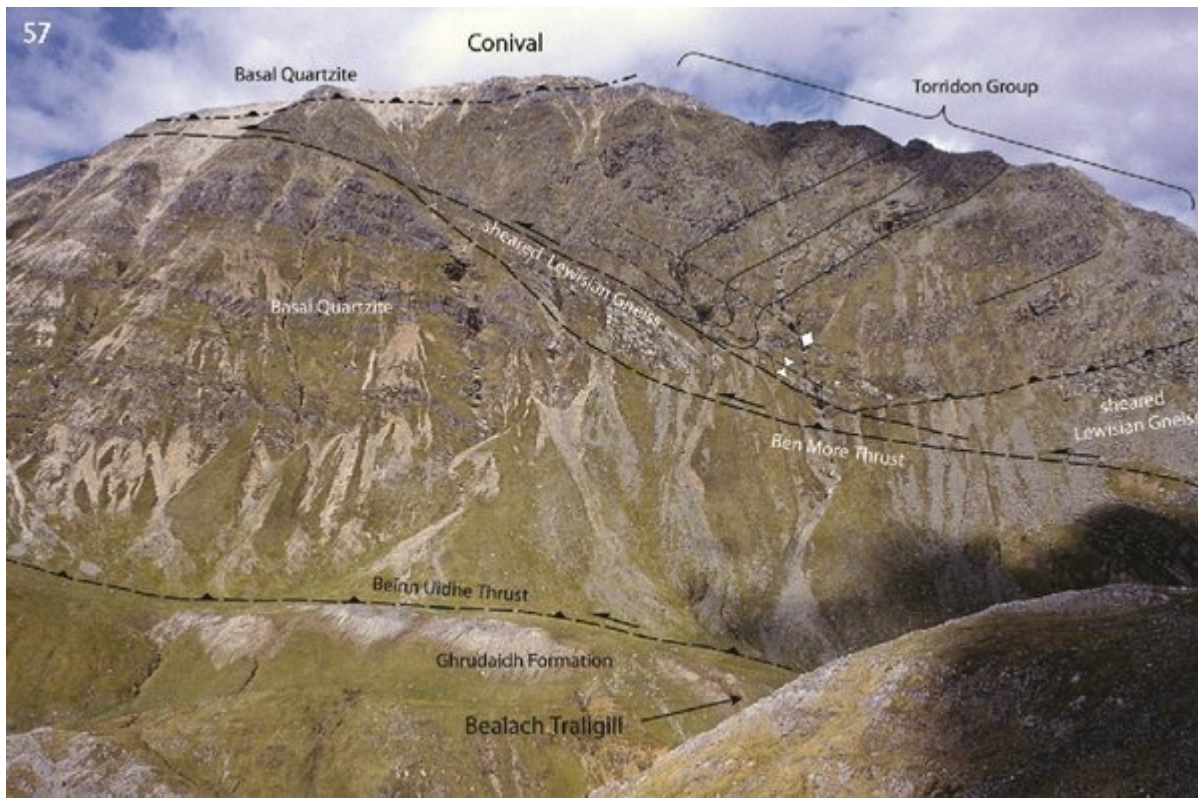


(Figure 55) Simplified cross-sections showing the structures to the north and south of the Traligill Fault.

56



(Figure 56) View west along the gorge formed by the Traligill Fault from the approach to Locality 7.7, with cliffs of fractured quartz arenite. (BGS photograph P702205, © NERC)



(Figure 57) View of the south face of Conival from Locality 7.9, showing the main thrust structures. (BGS photograph P531829, © NERC)