

**Pst:QGL-4 Styles and dynamics of glaciation in the Northwestern and Central Scottish Highlands during the Last Glacial-Interglacial Transition**

QRA/INQUA POST-CONGRESS FIELD TRIP

Dates: 1-5 August 2019

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Minimum number of participants: 13; Maximum number of participants: 20

We urge you to finalise your travel arrangements only after the field trip has been confirmed at the end of March 2019. The QRA is not responsible for any costs incurred by participants due to cancellation of non-viable field trips.

Price: **£420** non-shared accommodation; **£315** shared accommodation

**Please note before registration:** This field trip takes in some of the more remote, spectacular upland parts of the Scottish Highlands that are only accessible on foot. We will walk at least 8-12 km on each day, covering ascents of 100-500 m, using footpaths, but we will also walk off-track on uneven ground. We will be away from public convenience stops and shops for most of the days for extended durations. Transport will be provided in the form of minibuses driven by the organisers, and opportunities to buy food and drink will be given at the start of the day, or a packed lunch provided where this is not feasible (days 2 and 3). The weather in Scotland can be very changeable, so please be prepared for rain, cold and hot weather alike (full waterproofs, i.e. trousers and jacket; hiking boots, hat, gloves, sun hat, sun cream, layer-principle of outdoor clothing (no jeans or cotton clothing!); don't forget a day-pack to carry your provisions). Physical fitness and the ability to cover the above distances is a pre-requisite to attend this trip. In order to ensure the safety of the whole group, the organisers may require you to stay with the vehicles if you are unable to participate fully in the longer walks and/or are inappropriately equipped for fieldwork in Scotland.

**1. DESCRIPTION**

This fieldtrip will visit mountainous locations in the Northwestern (Sutherland) and Central Highlands (Monadhliath, Gaick, Pass of Drumochter) as well as sites en route that will be of broad interest (Wester Ross, Torridon, Glen Roy). Themes centre on different styles of glaciation during the Last Glacial-Interglacial Transition (corrie glaciers, transection glacier complexes, plateau



icefields), with particular focus on the Younger Dryas. The fieldtrip will cover a diverse range of problems:

- geomorphological contrasts between Younger Dryas and older phases of glaciation;
- the effects of topography on the style of (de)glaciation, especially alpine vs. plateau styles of glaciation and ice sheet retreat;
- processes of moraine formation and insights into glacier dynamics;
- challenges of dating glacier fluctuations in Scotland using radiocarbon, cosmogenic radionuclide (CRN) and optically-stimulated luminescence (OSL) dating;
- ice-mass-based palaeoclimate reconstruction; and
- palaeoenvironmental records inside and outside glaciated sites.

Travel arrangements will be made so that participants can easily arrange their own stay in Scotland after the trip or travel elsewhere in Europe.

## **2. JOINING INSTRUCTIONS**

Please note that you will need to buy your own travel insurance to cover you for any accidents, delayed flights, costs of missing the arrival meeting point etc.

### ***Arrival***

The trip starts in the early afternoon of Thursday 1 August 2019. We will have two pick-up points: at 13.30 h at Inverness railway station (in the parking bays opposite 1 Falcon Square next to the station's eastern side exit) and at 14.00 h in the arrivals hall at Inverness airport (international airport identifier code: INV).

Participants should ideally aim to arrive in Inverness the evening before (Wednesday 31 July 2019) to avoid any problems due to missed or delayed flights, but if you can only arrive on Thursday 1 August 2019, then please make sure to arrive at least two hours before the scheduled meeting points at the railway station and airport – we will have to leave promptly at the times stated above.

There are various flights from Dublin to Inverness by various flight companies. Some are direct and more expensive, others cheaper, but then usually require two separate bookings (with 'no-frills' airlines) and possibly an overnight stay in Scotland or elsewhere in Europe.

### ***Departure***

The trip will end at 15.30 h in Newtonmore on Monday 5<sup>th</sup> August, where participants can either make their own way from there, or be dropped off at Inverness railway station (c. 16.45 h) and Inverness airport (c. 17.30)

## **3. ITINERARY**

### **Day 1 (half-day) - Glaciation of Assynt, NW Scotland (Thursday, 1 August)**

Meet in Inverness – pick-up points in the city (13.30 h) and airport (INV, 14.00 h); see joining instructions below. Drive to Inchnadamph.

Sites visited: Knochan Crag – a brief introduction into the geology of this classic area (Moine Thrust); Ice sheet glaciation and deglaciation – geomorphological imprints and geochronological controls; Lonan

Valley moraines and age controversy; Younger Dryas cirque glaciation along NW coast of Assynt; tour along coast.

*Stay at Inchnadamph Hotel*

### **Day 2 - Glaciation of inland Sutherland (Friday, 2 August)**

Ice sheet glaciation of inner Sutherland, and the role of erratic dispersal trains; Younger Dryas glaciation: moraine distribution, sedimentology and glaciodynamic implications; high- and low-level evidence of transection glacier complexity; geochronological controls on Younger Dryas glaciation and implications for morphostratigraphy.

*Return to Inchnadamph Hotel*

### **Day 3 - Younger Dryas glaciation of the Monadhliath (Saturday, 3 August)**



Drive south via Loch Ness; en route stop to discuss geological and glaciation history of the Great Glen; half a day around Loch Killin: sedimentary exposures containing evidence for complex oscillations of plateau ice during the LGIT; geomorphological and sedimentological evidence of Younger Dryas plateau glaciation.

Drive to Aviemore with potential to stop at the Glen Roy view point en route.

*Stay in High Range, Aviemore.*

### **Day 4 - Glaciation of the Gaick (Sunday, 4 August)**

Drumochter Pass: controversy over Younger Dryas glaciation and source areas; Glas Choire: ice sheet deglaciation and unzipping; ice-dammed lake formation and significance; sedimentological evidence of interaction of pre-Younger Dryas glacier oscillations and landscape; Younger Dryas glaciation; plateau vs transection glacier complex styles of glaciation.



*Stay in High Range, Aviemore*

### **Day 5 - Complex interactions between last ice sheet and Younger Dryas glaciation on the Monadhliath (Monday, 5 August)**

Drive to Glen Banchor: ice sheet deglaciation and lake damming; cross-cutting of pre-Younger Dryas and Younger Dryas glacial sediment-landform associations; geochronological evidence; landscape evolution.

Finish to enable train connection to Inverness and flights back (see joining instructions).