Report from the Refertilising Wester Ross meeting, 7th to 9th April 2016: Field Trip Report 7th April 2016

The aim of this meeting was to consider issues relating to nutrient management, biodiversity & restoring productive ecosystems in Wester Ross.

Several questions were addressed, including:

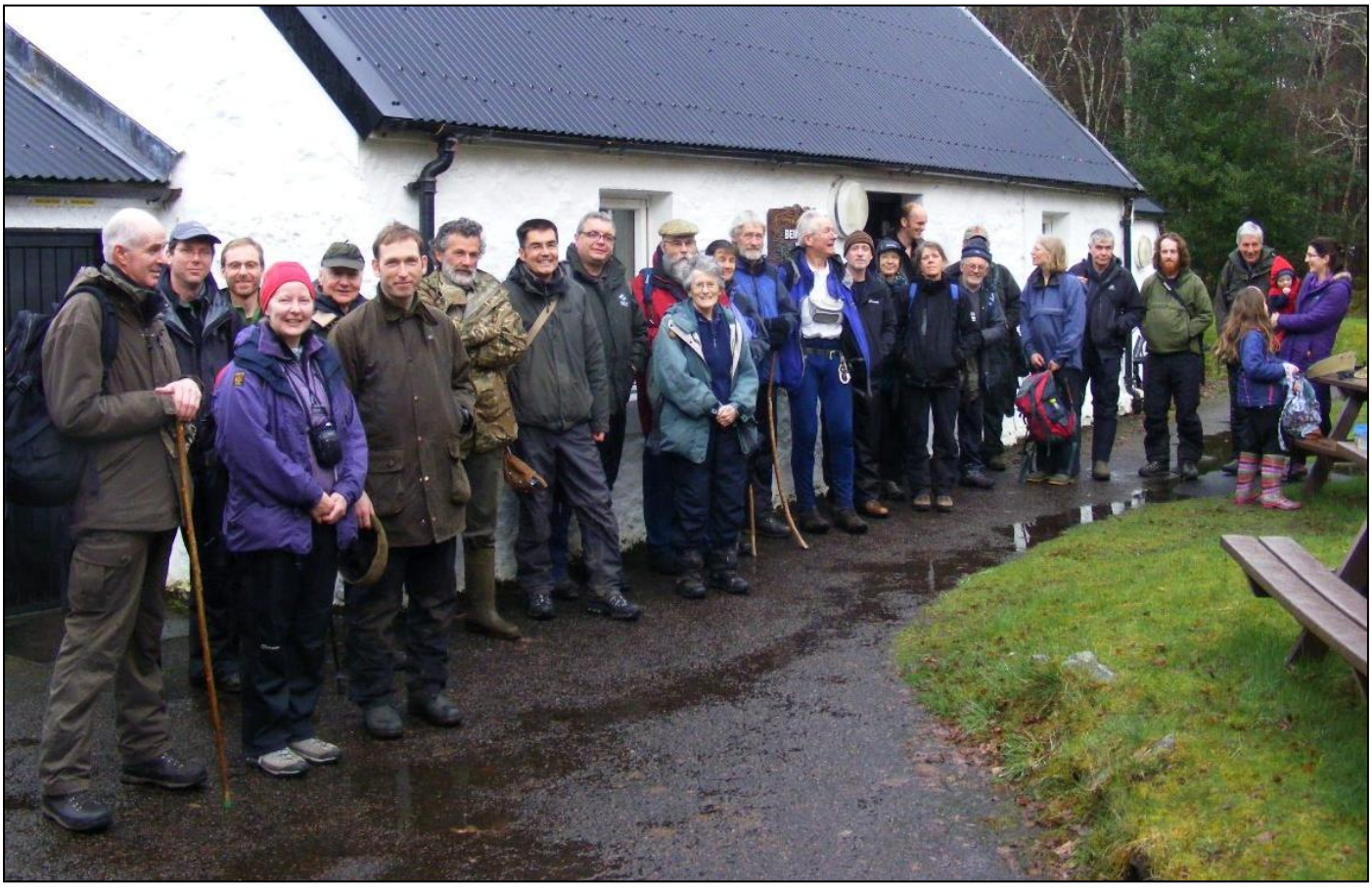
- *Should much of Wester Ross be more productive?*
- *Was it more productive in the past?*
- *Should we invest in reviving the 'human' ecosystems that other living things around us depend upon?*

One objective was to consider whether or not more could be done to restore and maintain the fertility of open ground and woodlands to produce more food for livestock and wildlife including deer and fish in the lochs and streams.

Field trip to Beinn Eighe NNR, Thursday 7th April am

Just after 10am, more than 20 people, including representatives from local areas and a wide range of organisations and agencies gathered at the Beinn Eighe NNR visitor centre for the first field trip of this three day meeting. After a welcome and some introductory worlds from Peter Duncan and Doug Bartholomew SNH about the Nature Reserve, and a few words from Tom Forrest, Chair of the Wester Ross Environment Network (WREN), following the recent announcement of the successful nomination of the Wester Ross Biosphere to join the world network of Biosphere Reserves, a group photo was taken outside *(below).*

[left to right]: Seamus MacNally (NTS), Scott Newey (The James Hutton Institute), John Holland (SRUC), Patricia Sturrock, Keith Dunbar, Charlie Hill (Beinn Damph Estate), Don O' Driscoll (JMT), Nick Benge, Prof Davy McCracken (SRUC), Dr James Merryweather (SLEF), Ro Scott, Anne Harnden, Roger Harnden, Richard Clarke, David Holmes, Sheila Dunbar, Doug Bartholomew (SNH), Mary Gibson (SNH), Les Bates, Kenneth Knott [hat] (FCS), Diane Gilbert, Peter Duncan (SNH), Donnie Chisholm, Jeremy Fenton, Iona McWhinney, Findlay McWhinney, Jess McWhinney. Also present Rob Dewar (NTS), Tom Forrest (WREN) . . .



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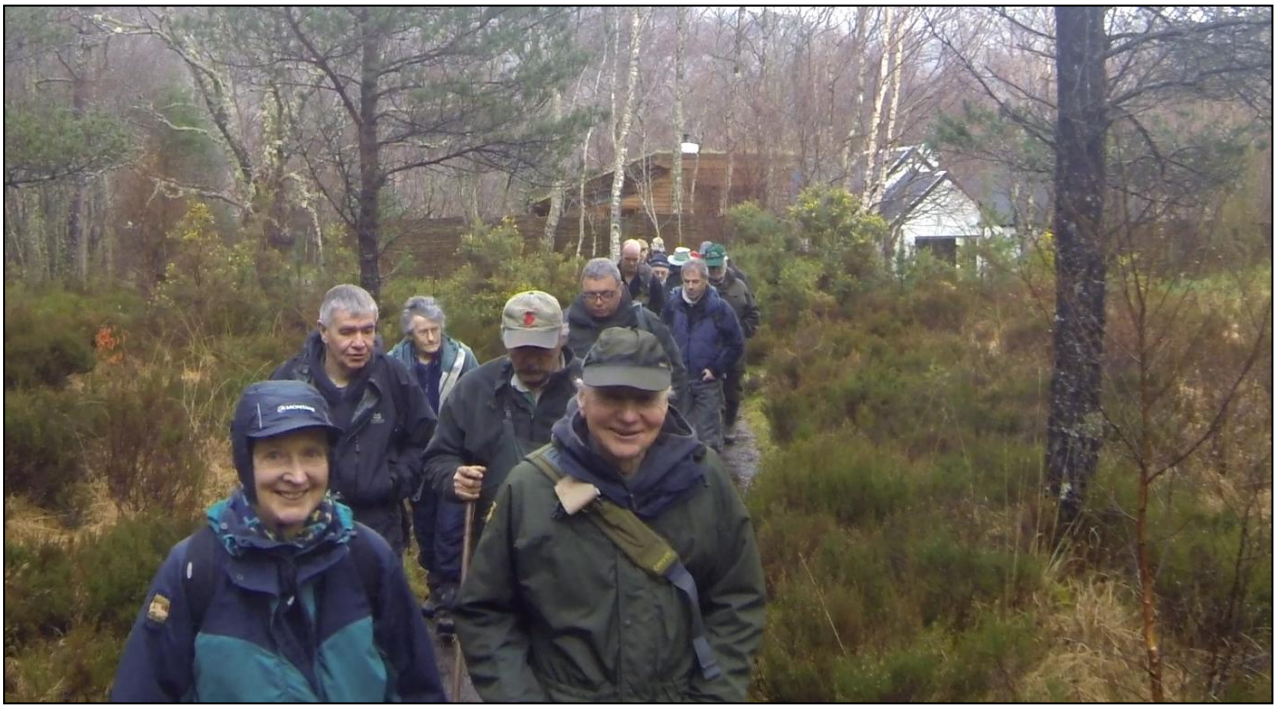
Setting off through the pine wood . . .



At our first stop on the viewpoint trail Peter Duncan outlined how the reserve had been set up to protect an area of ancient pinewood, and how over the years, management objectives had evolved. Trees had been planted on some of the knolls where they grew more successfully; an aim was to achieve connectivity with the pinewoods around Coulin and that this was progressing well and would in time benefit the deer as well as other wildlife. Currently the policy was to control deer number within the reserve to levels where small trees were able to grow. Care was taken to minimise the impact of deer control on the NNR to neighbouring estates: no stags were shot during the rutt when stags from neighbouring areas were more likely to wander onto the reserve.

Heading up the Pony Path

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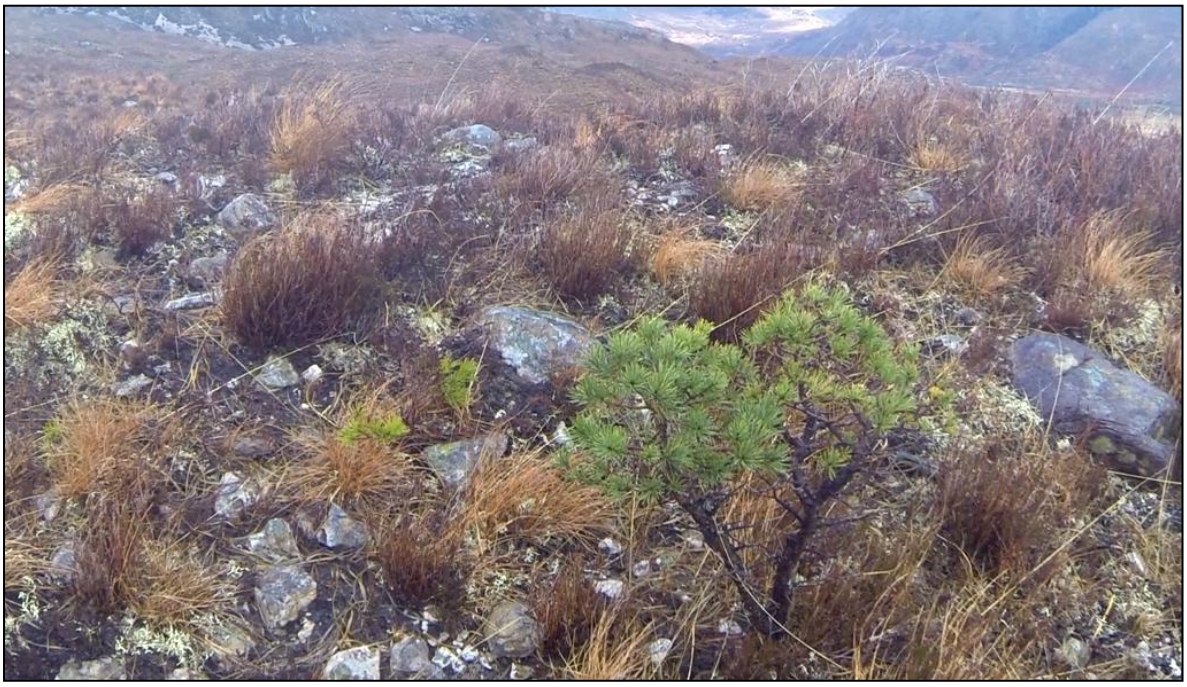
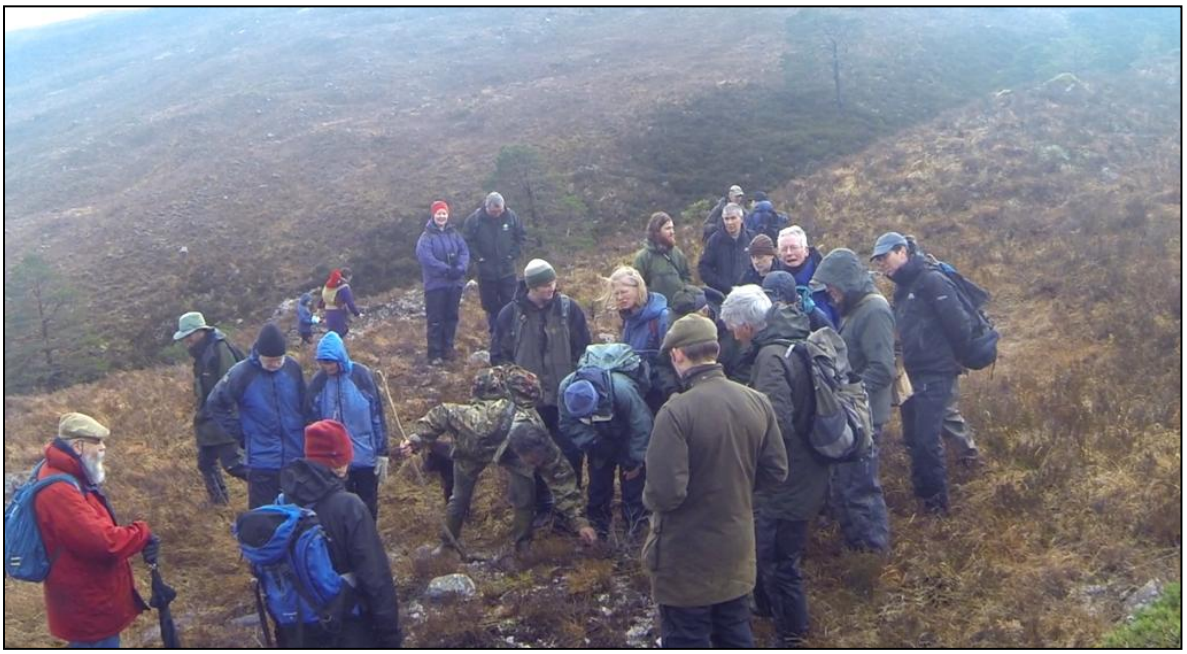
We explored many of the knolls, and considered why some of the pine trees were growing so slowly compared to others? Suggestions included exposure to wind and weather, and browsing by deer. We also discussed whether or not there were some places that were more fertile than others, and that soil fertility could be a principle factor limiting the rate of growth of the wee trees.

Small stunted pine tree near the Pony Path. Note the sparse and patchy vegetation surrounding the wee tree.



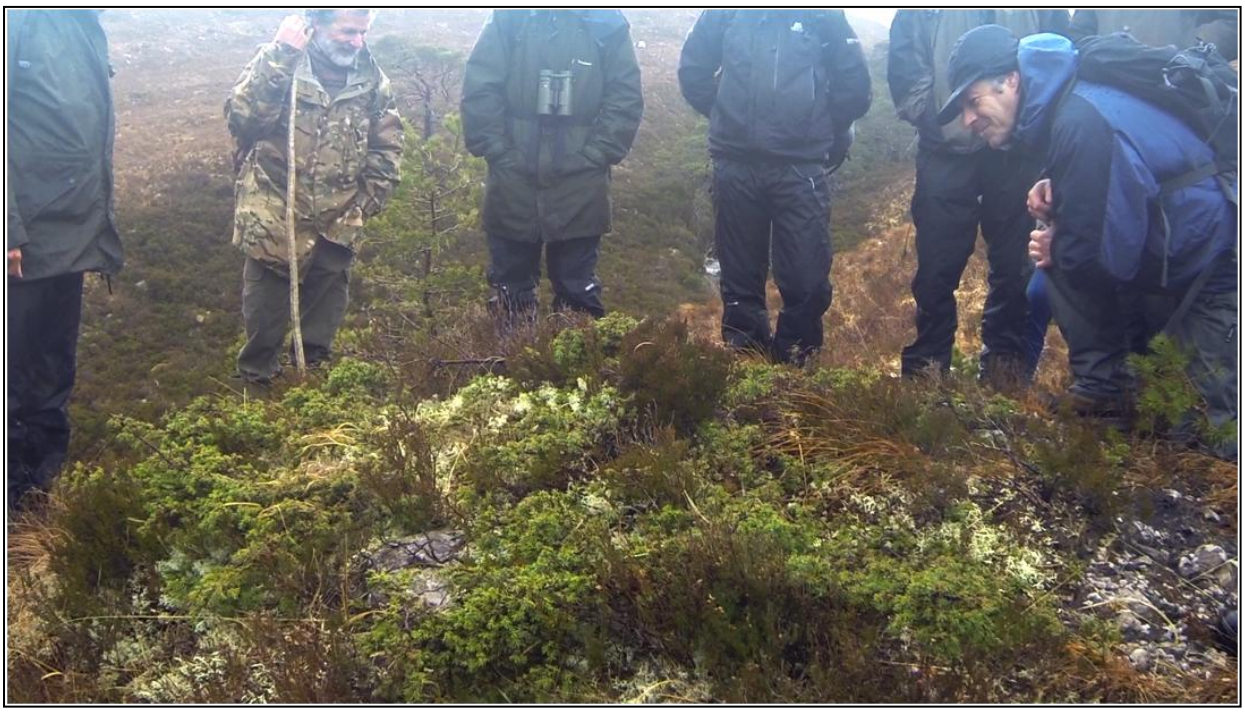
The soil by the side of the path was of glacial origin and largely derived from the quartzite bedrock of the area, providing little phosphorus or other nutrients.

Don and Ro examine one of the wee pines.

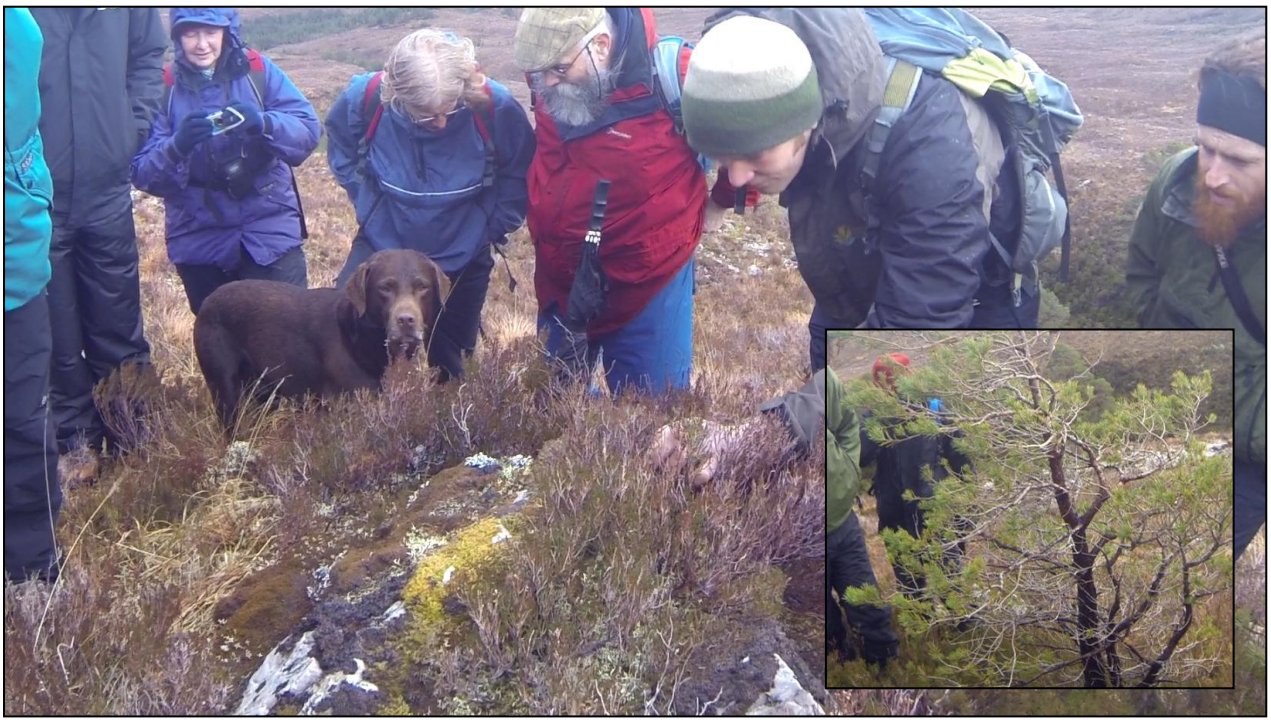


As well as small pines, some of the knolls support juniper and other berry bearing shrubs. Ro and Dianne told us about the two types of juniper which can be found on Beinn Eighe NNR, the upright form (mainly at lower elevations) and the prostrate form (mainly higher up?). These are genetically different, however ?they can hybridise.

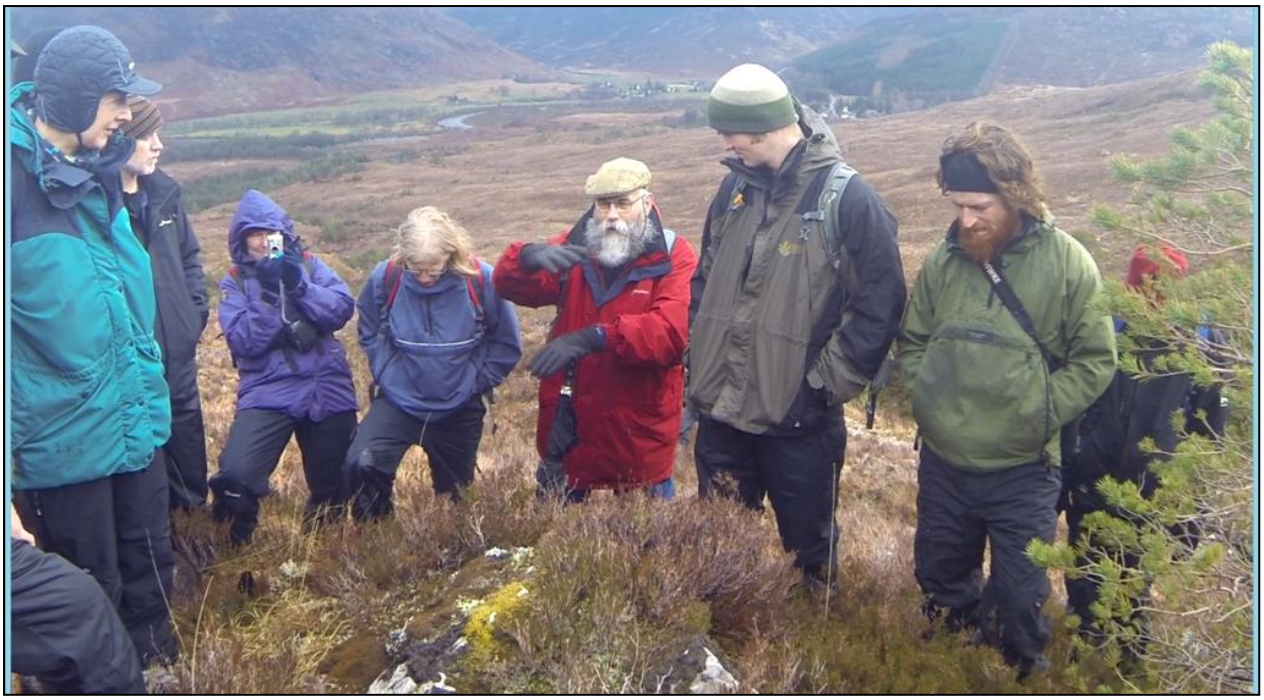
Rob Dewar examining a juniper bush on one of the knolls. We were discussing how pine marten and other animals visit these places and leave their droppings, providing additional nutrtient for plant growth.



By the side of the next knoll was a larger pine tree *(below, inset),* which despite comparable exposure to wind and browsing by deer, appeared to be stronger and healthier than many of the other pine trees nearby. This tree was next to a perch *(main picture below)* with surrounding bushier heather, suggesting (according to Peter C) that the tree was benefiting from some additional nutrient derived from animal droppings.



James Merryweather explained further *(below).* He described [possibly at another point during the excursion] how the mycorrhizal fungi that some trees purchased from nurseries are inoculated with (to be planted elsewhere) may be unsuitable for the ground and other conditions in which they were planted, and that it was important to be able to work out whether suitable fungi were likely to be present in areas where trees were to be planted.



As we started to make our way back (over ground to the north of the path), we found a bearberry bush on one of the knolls with bright red bearberries. The bush was attached to some large roots, suggesting it was very old. Nearby were grouse droppings, and we discussed whether or not grouse would be able to select these places to find heather of higher nutritional quality than elsewhere? No one was quite sure of the answer to that question.

Bearberry knoll. Lots of biodiversity here, including grouse droppings, bushier heather and lichens and taller grasses than in surrounding areas.

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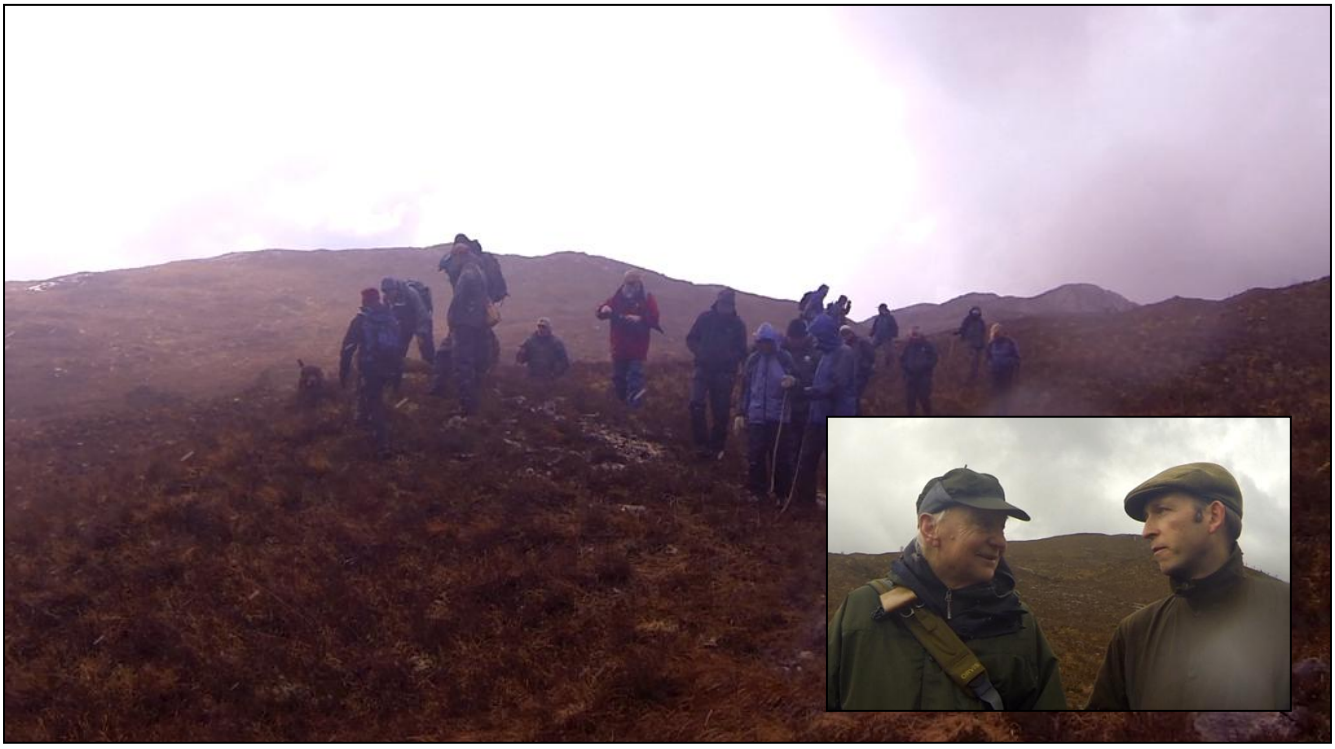
Close up of grouse droppings by bearberries on the knoll in the previous picture. Ro Scott was the first to spot the berries! Wouldn't it be a fine thing to have more bearberry bushes in Wester Ross.

A brief shower did not hinder discussion (inset Keith Dunbar and Charlie Hill) . . .



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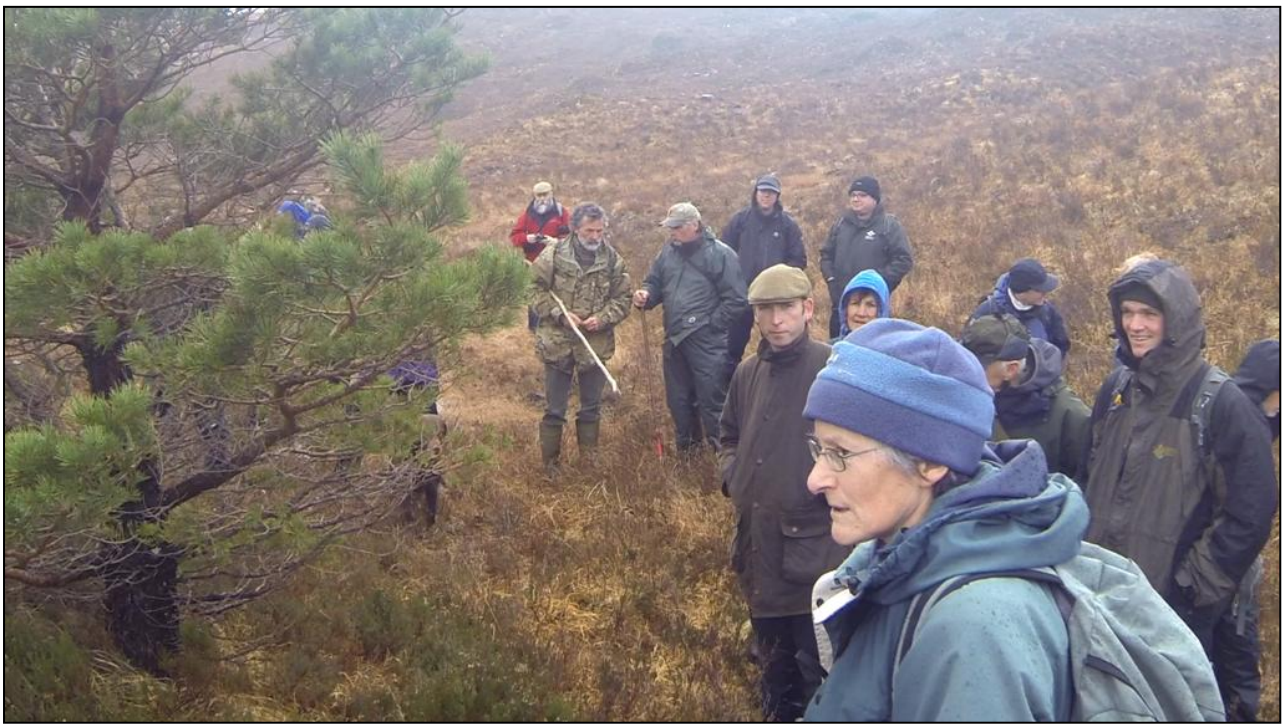
Many of the knolls have thick moss which seems to grow around other plants. This may be part of the soil forming process; the moss is possibly a very efficient trap for the nutrients from droppings of animals. This mossy knoll *(below)* had a burrow in it (possibly that of a mouse and also a nibbled blaeberry plant. There was an animal dropping on the moss *(inset),* initially thought to be that of bird, however possibly that of a pine marten.

A little further on we found this much larger, older pine tree *(below),* which may have pre-dated the nature reserve Various explanations were proposed as to why it might have survived; possibly it had escaped wildfires before the reserve was established. Peter D suggested that growth may have been suppressed by browsing by deer until recent years. Three kinds of heather (ling, bell heather and cross-leaved heath) were found here.



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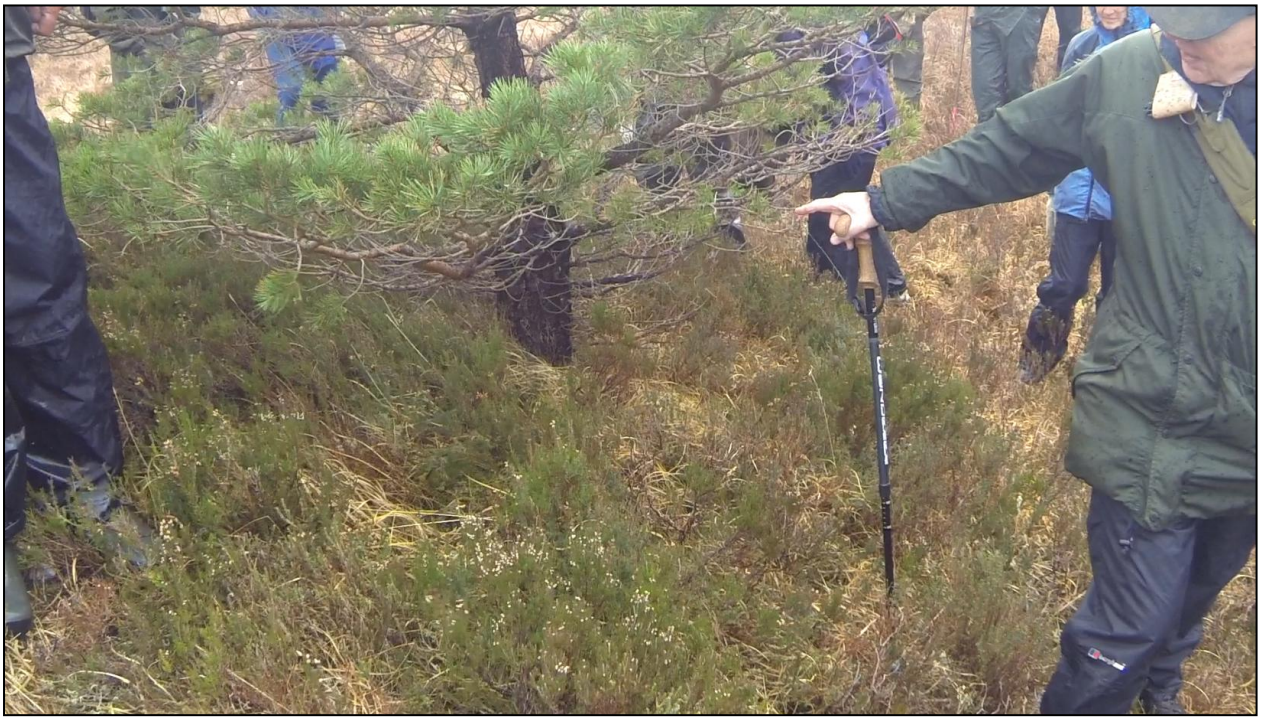
This pine tree was growing from an area with much thicker soil and heather than on the surrounding ground *(below).*



At the opposite end of the fertility spectrum to the 'green knolls' are areas of ground which support very little vegetation. A typical example is shown below. Soils have been trampled and washed away, and the plants that are present are indicative of very low nutrient status (*note bog asphodel flower stalks in picture below*).

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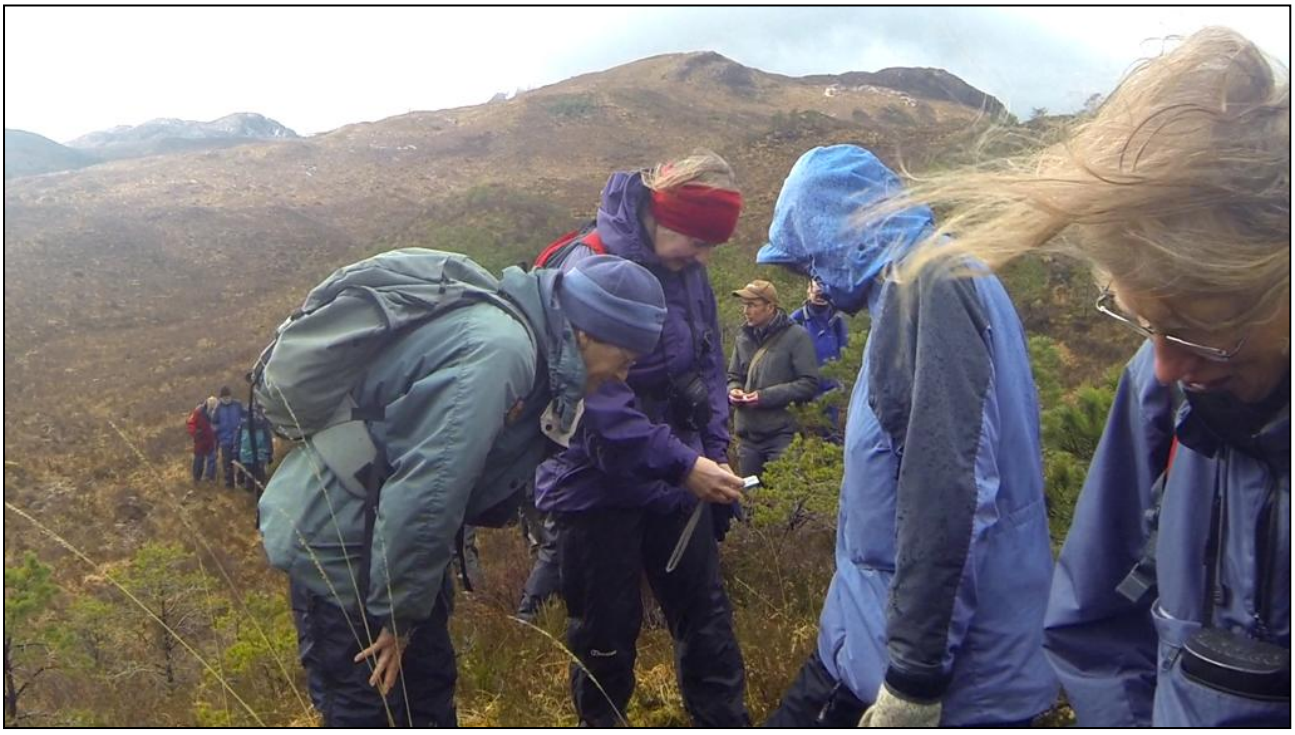
Another discussion . . .



Not all knolls are green. This picture *below* is of an area on the top of a ridge, which in terms of topography is much the same as some of the 'green' knolls. There is a 'green knoll' just 20 m away with small pine trees growing around it. So the formation of 'green' knolls can't be explained without considering how much the animals use these places.

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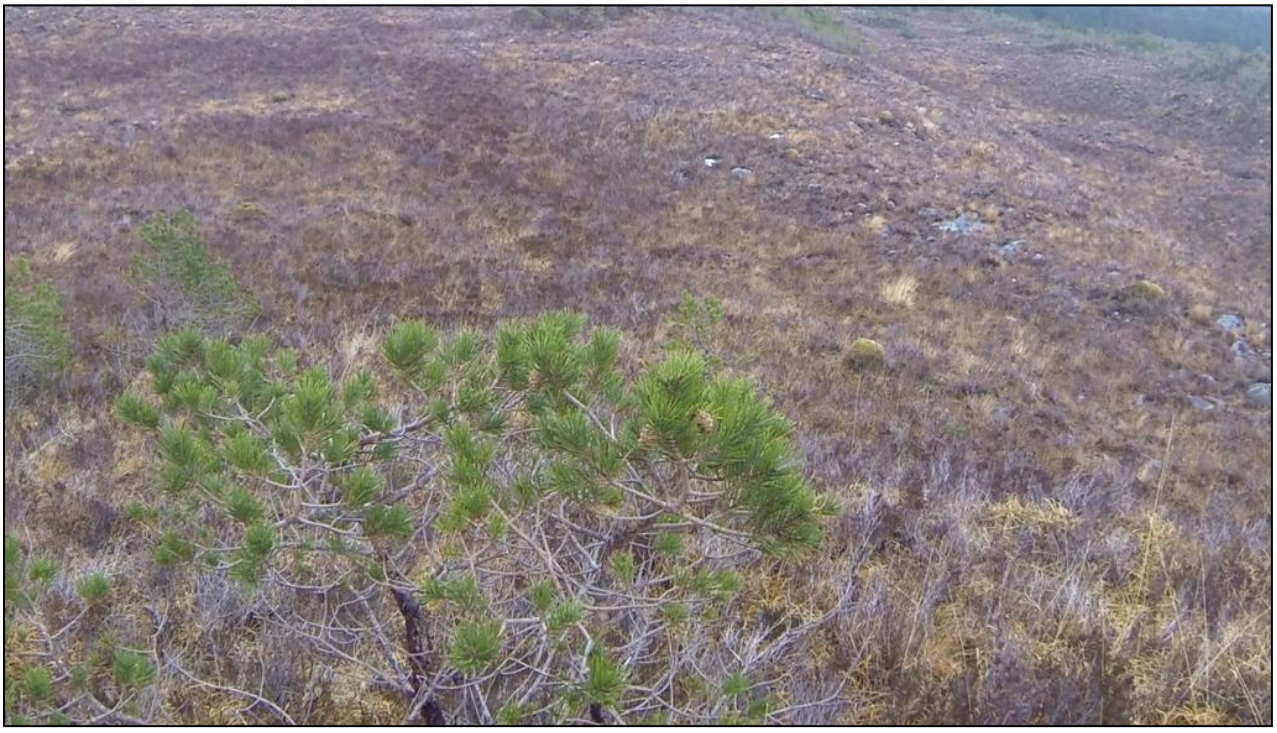
Stunted pine trees:

The tree in the picture *(below)* has only its last year's stunted pine needles. Kenneth Knott explained how the trees adapt to nutrient stress: where there are inadequate nutrients, the trees shed their older needles after reabsorbing some of the nutrients which they can use to grow new needles. This tree is surviving just in no more. Nearby was a similar sized tree that had died.

Also nearby was this pine tree *(below);* despite its small stature it has produced cones. Kenneth explained that this is another indicator of nutrient stress; the tree produces cones prematurely as it attempts to reproduce.



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Other notes from the morning field trip to Beinn Eighe NNR on 7th April

- We also discussed the possibility of nitrogen also limiting plant growth. I've made the following notes:
  ?Nitrogen becomes available through mineralisation of peat;
  ?bog myrtle has associated bacteria which can 'fix' nitrogen;
  ?however myrtle is not good at releasing nitrogen for other plants
- We discussed the years of grazing and burning prior to designation of the reserve and the 'naturalness' of the landscape.
- The current management plan was to leave up to 5 carcasses on the hill each year; the others would be removed for sales of venison.
- The current aim of management of the NNR was to restore forest over period of hundreds of years; to take a long-term approach.
- Pine trees planted on the reserve and on neighbouring estates were now of local provenance, grown on the NNR nursery.
- Pine sawfly can cause damage . . .
- PD described how birch woodland is growing up well [esp. along the southeast side of the reserve].
- The need to replace nutrients lost in the past was discussed.
- The role of dead wood was discussed; and whether this could contribute to restoring ecosystem processes.
- Use of camera traps was discussed (for use on knolls and other places).

Back by the NNR Visitor Centre we thanked Peter Duncan for coming along and telling us many things about the reserve; then we had lunch. Thank you to Doug Bartholomew and SNH for providing teas and coffee at the SNH Field Centre. Apologies to those who set off for the Whistle Stop Cafe hoping to get a bowl of soup – they were full up (I should have booked a table)!

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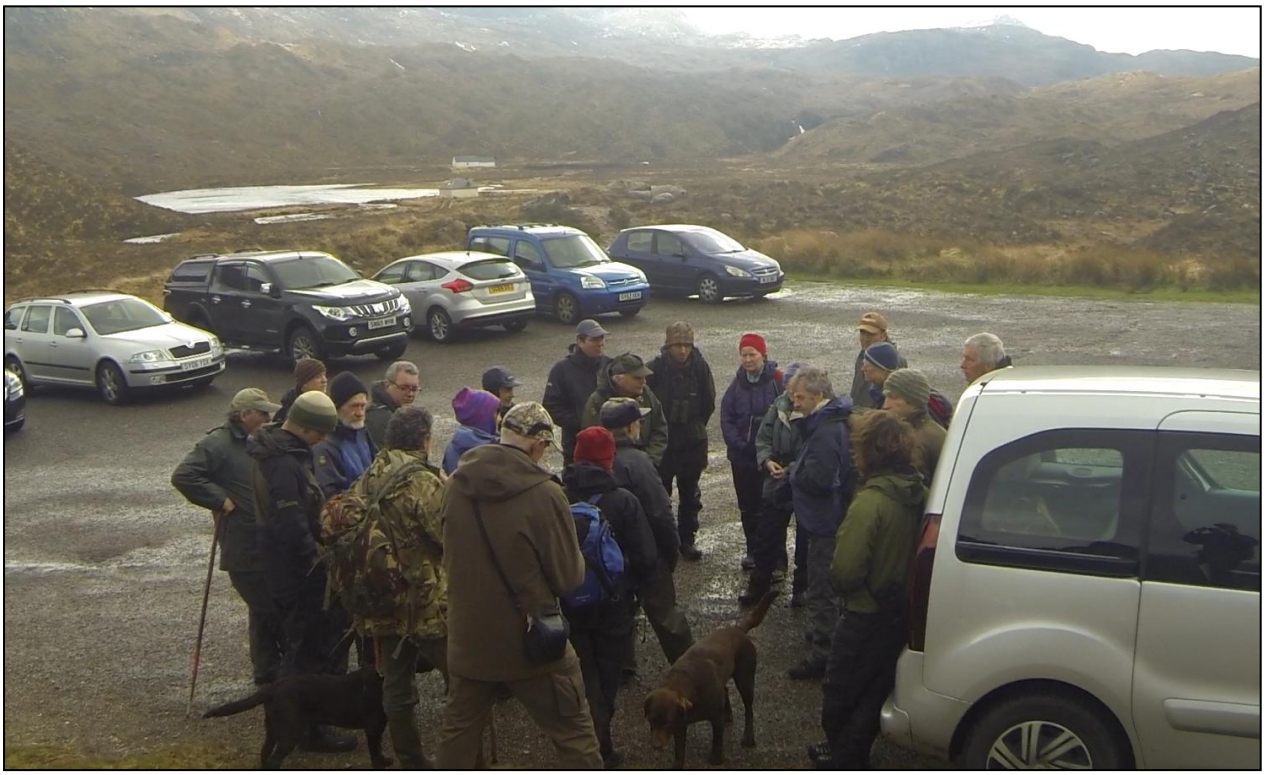
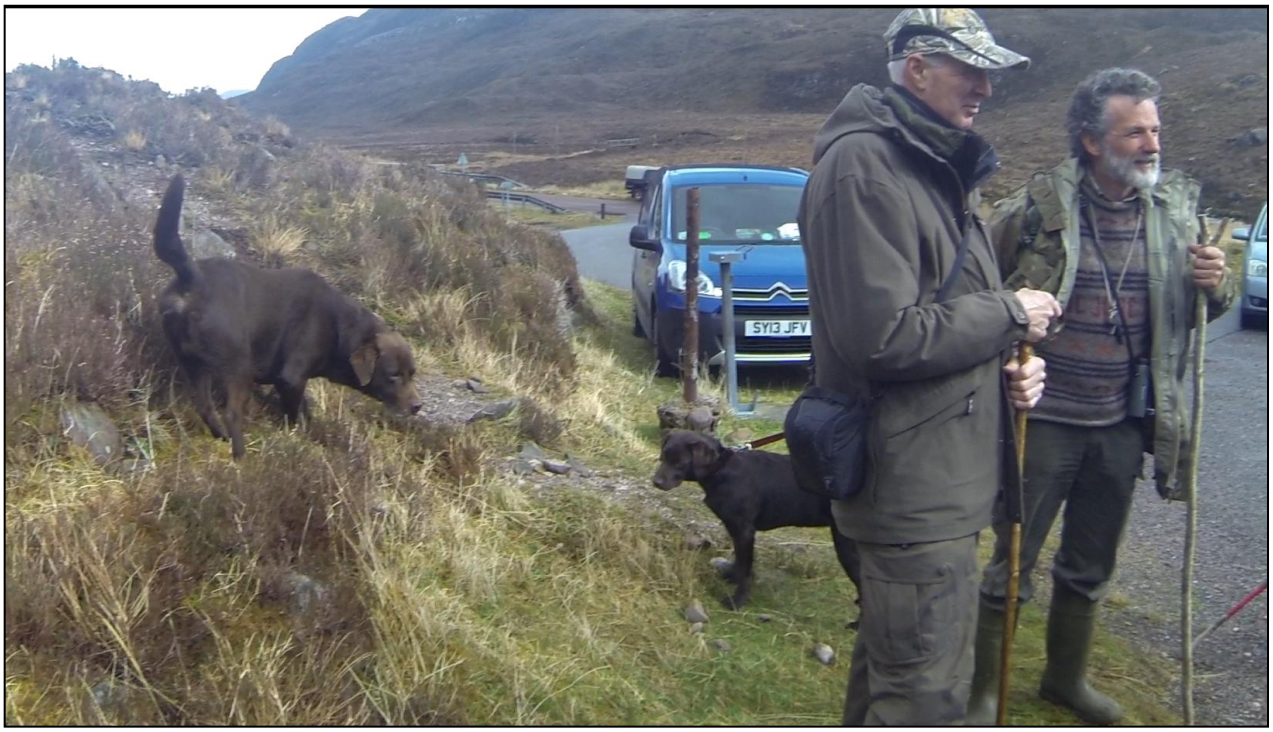
Field trip to Glen Torridon: 7th April 2016 pm

We gathered at the car park opposite Loch an Iasgair, from where the footpath to Coir Mhic Fhearchar sets off.



The ground around the car park is nutrient enriched and grassy (dogs . . .) in contrast to much of the surrounding area . . .



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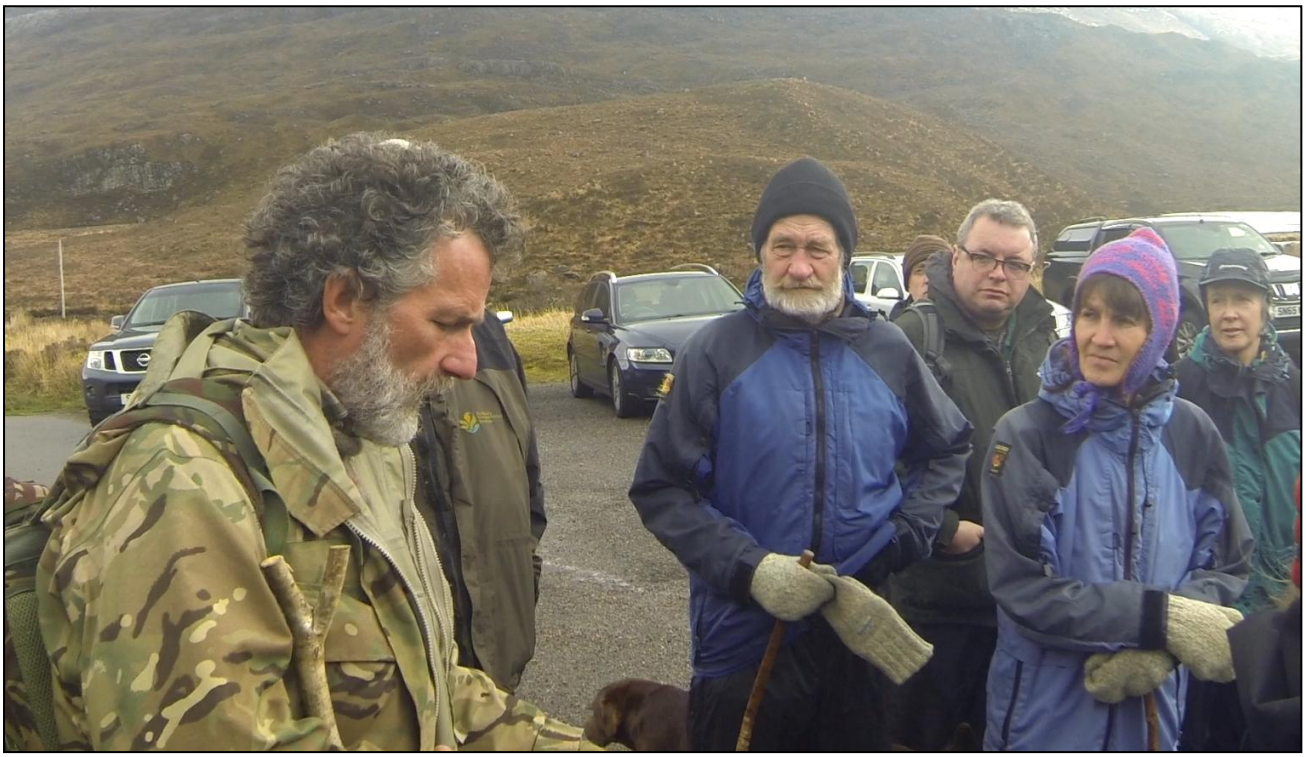
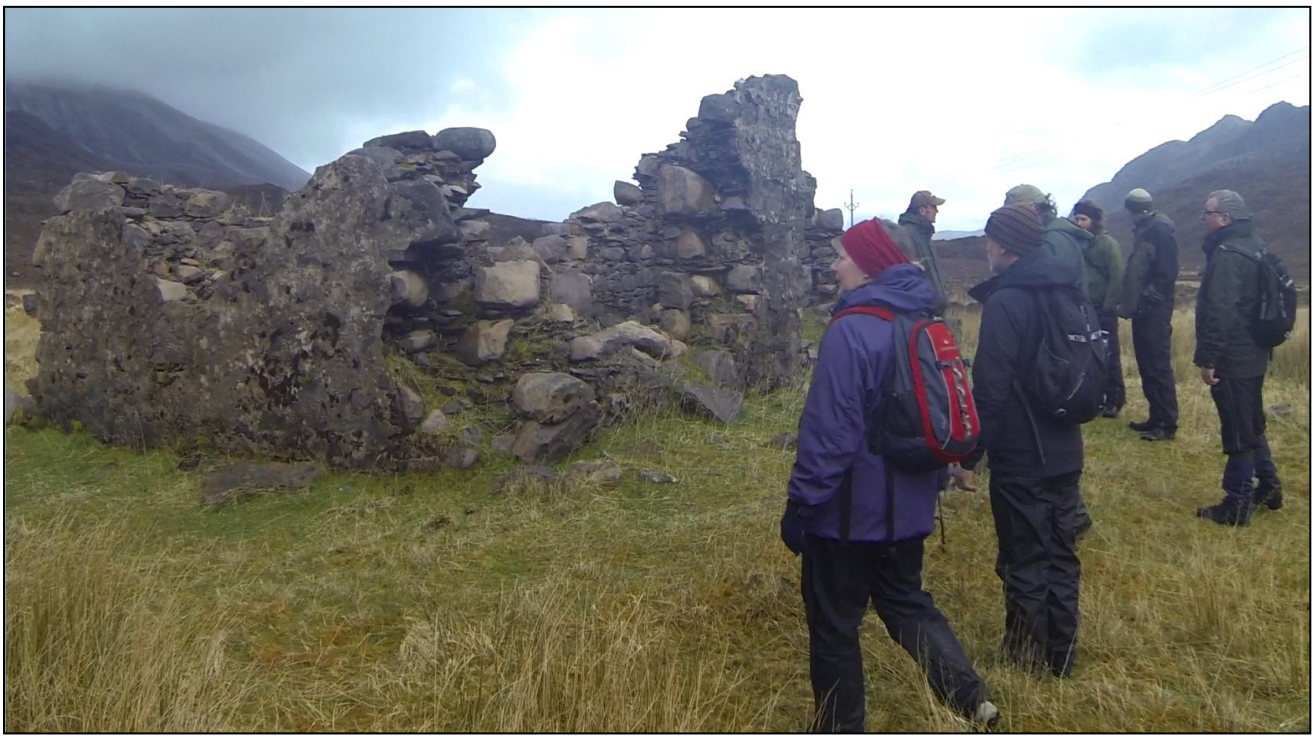
Charlie explained that sheep were grazed on Common Grazing land on the other side of the Torridon River. We discussed heather burning to improve grazing in the west of Scotland. In some areas when it is burnt poor grasses such as molinia come back which are full of silica, as *Don explains below*. 'Does sheep no good . . .'. Dave McC reminded everyone that burning has been carried out for thousands of years; the issues were much the same in many parts of the world including the west of Ireland. Someone suggested that agricultural advice was not clear.



We crossed the river over the road bridge. Our first stop was at the ruin of a cottage by the side of the burn; which was surrounded by a green grassy area *(below*). Seamus said Donnie Mackenzie's grandfather lived in the cottage (which was possibly built as a shepherd's cottage?).



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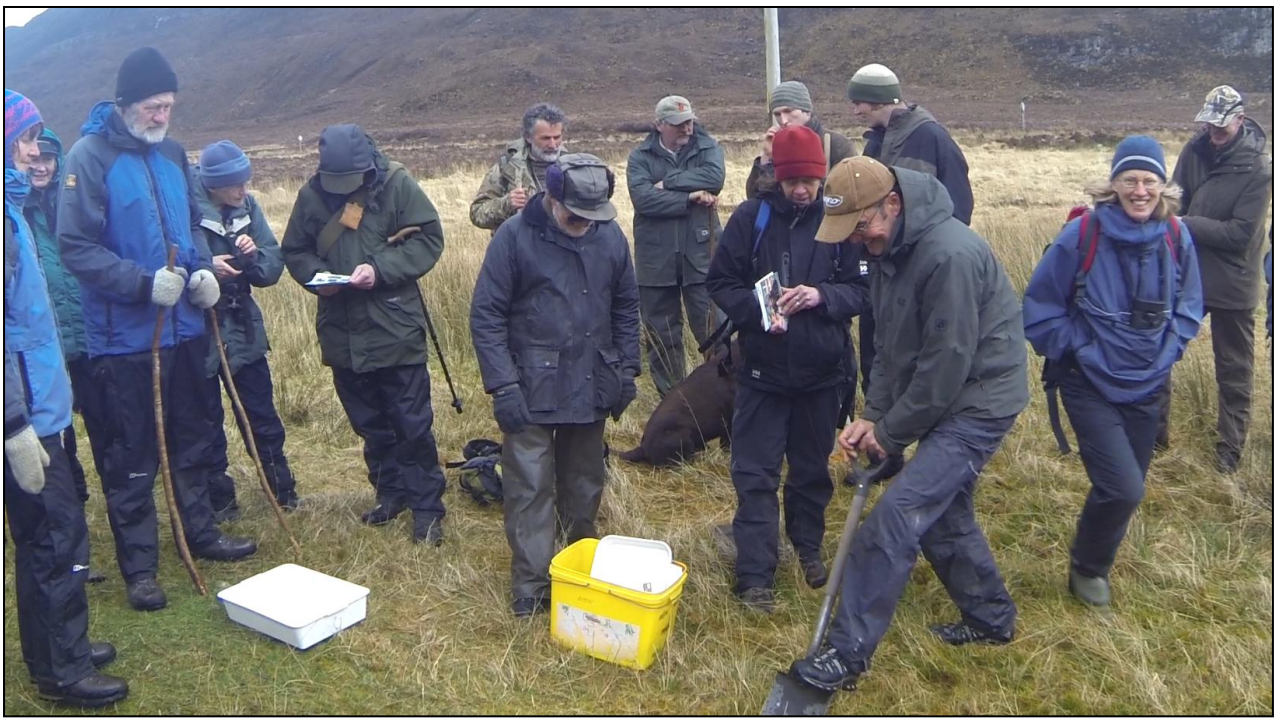
Before looking for earthworms, we looked towards the woodland scheme further up the burn, where a fence had been erected around the gorge with the intention of encouraging the woodland to expand out from the gorge to spread onto the nearby hill side. After many years there had been virtually no spread of the woodland in the gorge. . . .'because of a lack of nutrient in the soil?'

The woodland enclosure is in the upper right quarter of the picture below.

Using the OPAL Soil Survey pack, we set about looking for earthworms in the soil by the ruin *(below).*

Nick Benge demonstrates the art of digging, as Mary Gibson provides guidance. 'Don't chop the worms'.



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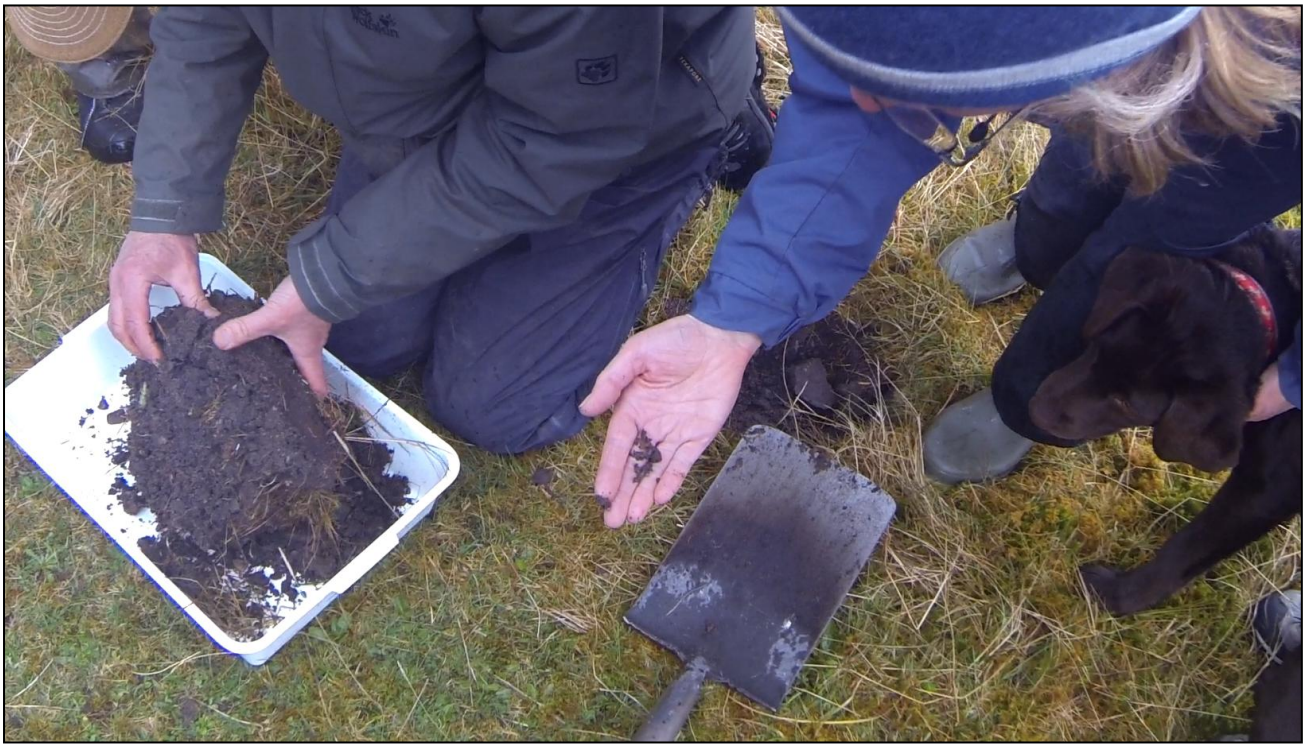
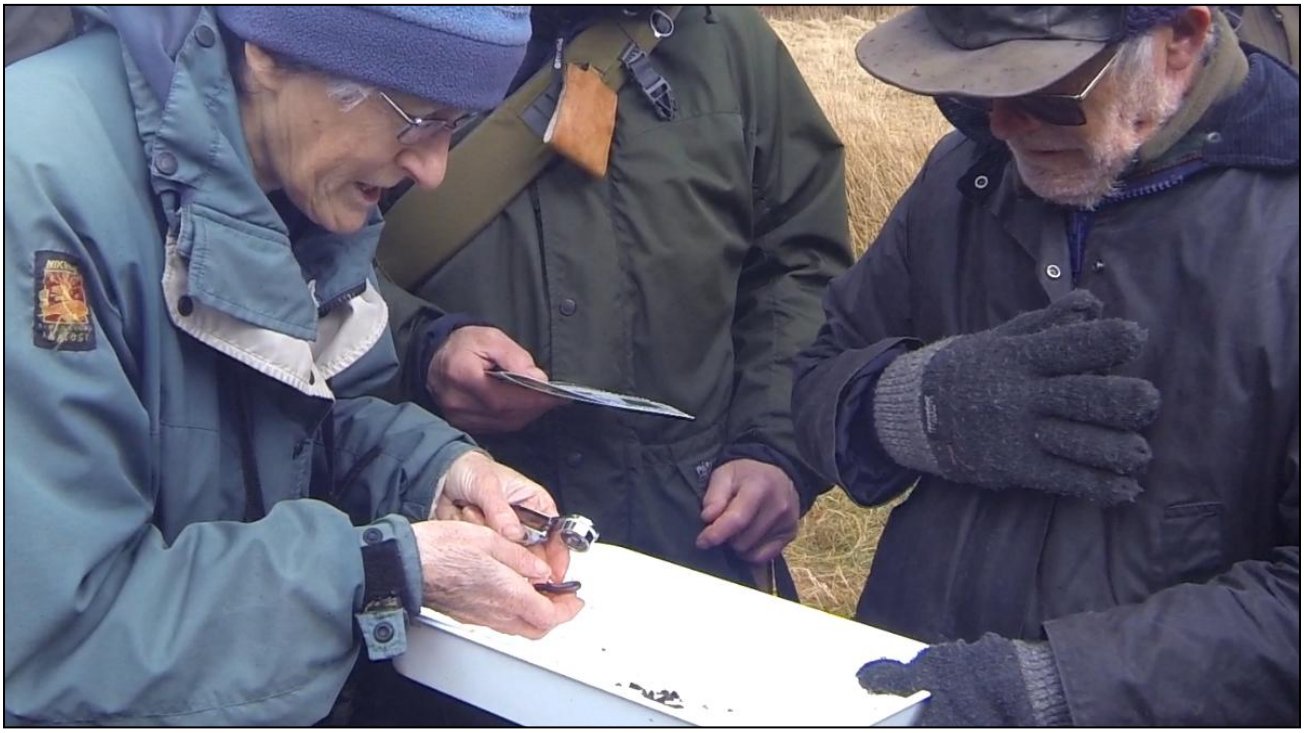
Success: as Nick breaks apart the turf, Diane spots an earthworm in the excavated hole . . . *(below)*



Ro and Les identify the worm *(below)* and several others as ?Black-headed earthworms (the other suggestion was lobworm, however I think most were agreed that they were black-headed worms).



A second pit was dug closer to the road, however no more worms were found. The population around the ruin appears to be isolated.

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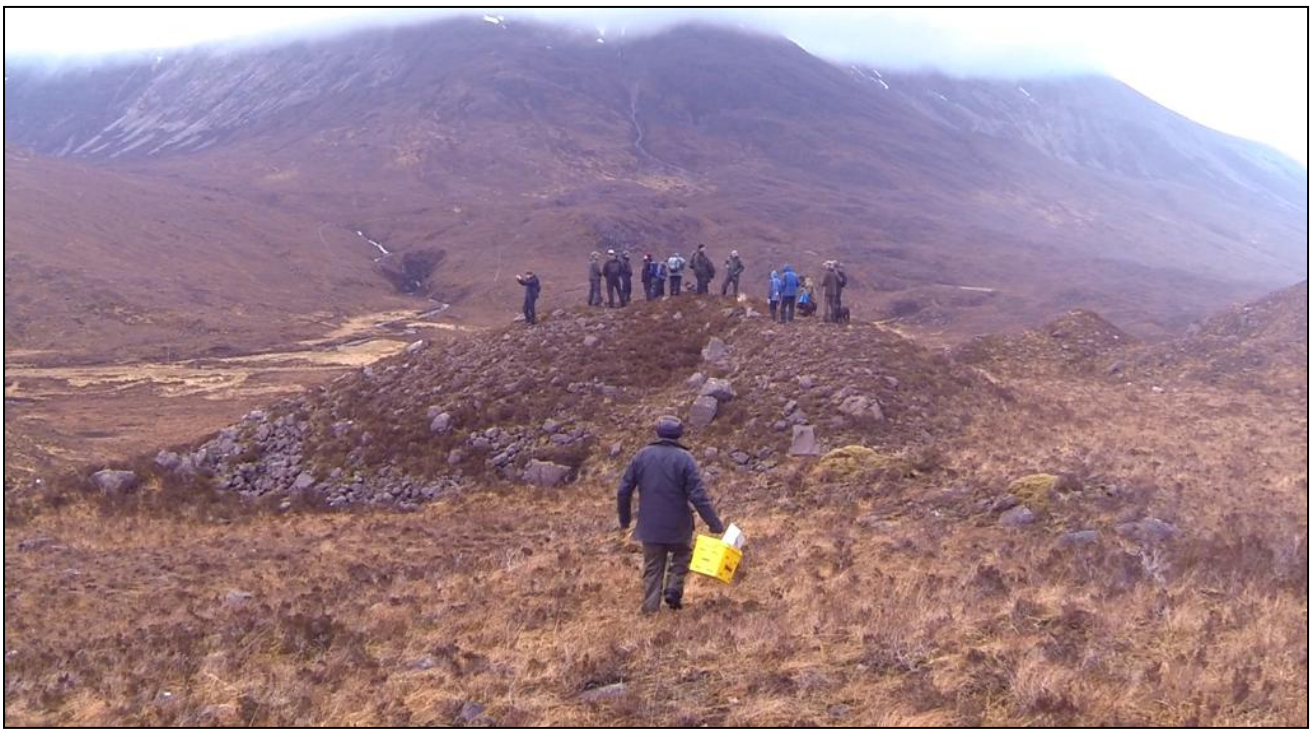
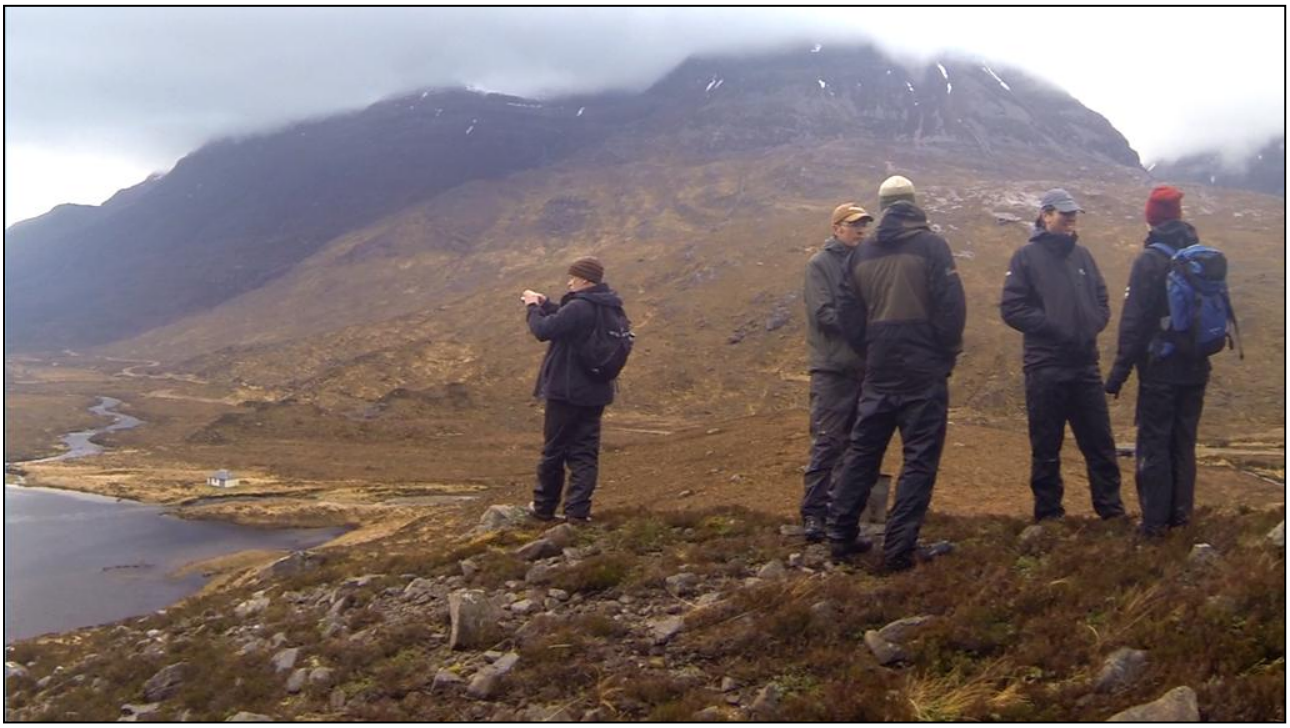
We crossed the road and followed the path to the footbridge over the burn (Feith Ghlas) discussing sea trout and otters which follow salmon and sea trout to spawning areas in the autumn. Then we headed towards the Ling hut, leaving the path to scramble up onto a ridge overlooking Loch an Iasgair.

A ridge with several knolls above the path, looking towards Beinn Eighe in the clouds. Most of the glacial till here is of Torridonian sandstone fragments.



Loch an Iasgair, from the ridge. This loch is a holding pool for salmon and sea trout, and is a settlement pond for material washing in from the inflowing burns.

Liathach was also in the clouds. Note the patchy vegetation on the ridge.



The dogs showed much interest in the next mossy green knoll just a few 10s of metres away; pine marten droppings were found *(below).* Nick explored and found mouse burrows all the way through. Do pine martens visit these places in search of food, to mark their territories, or for both reasons?

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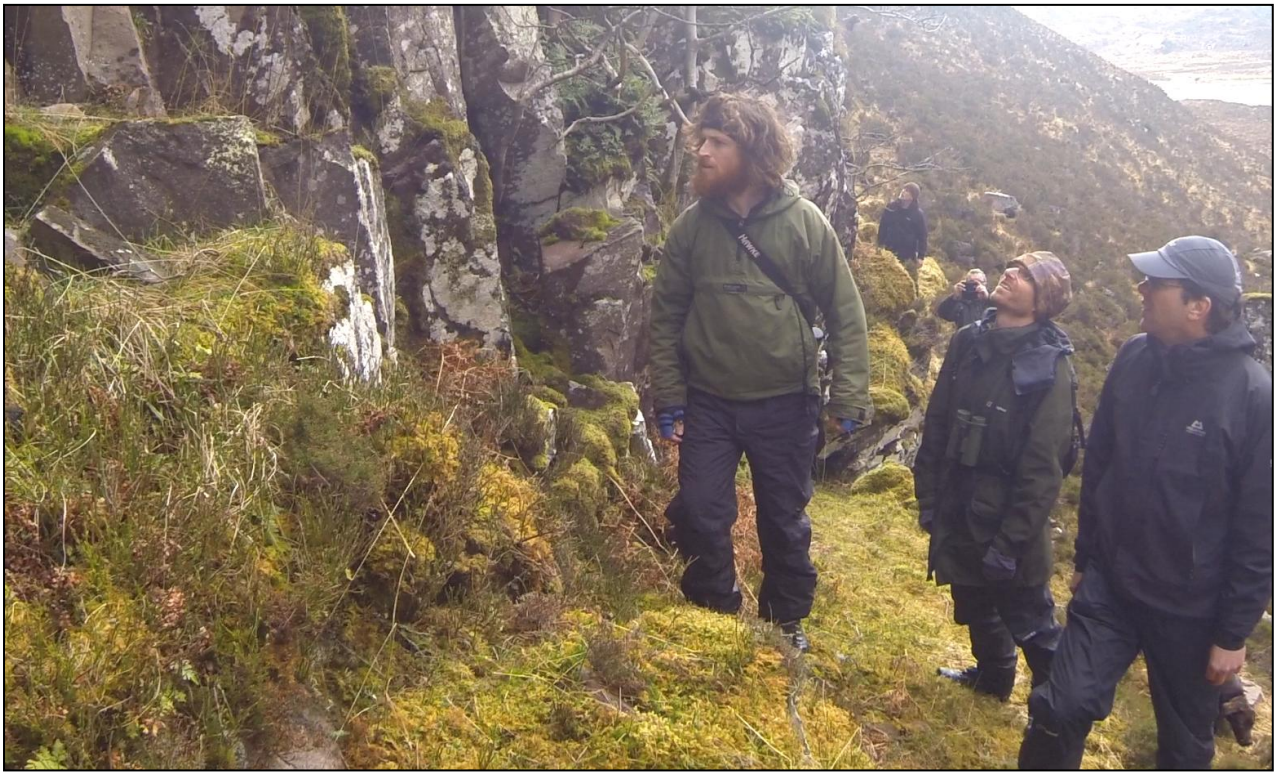
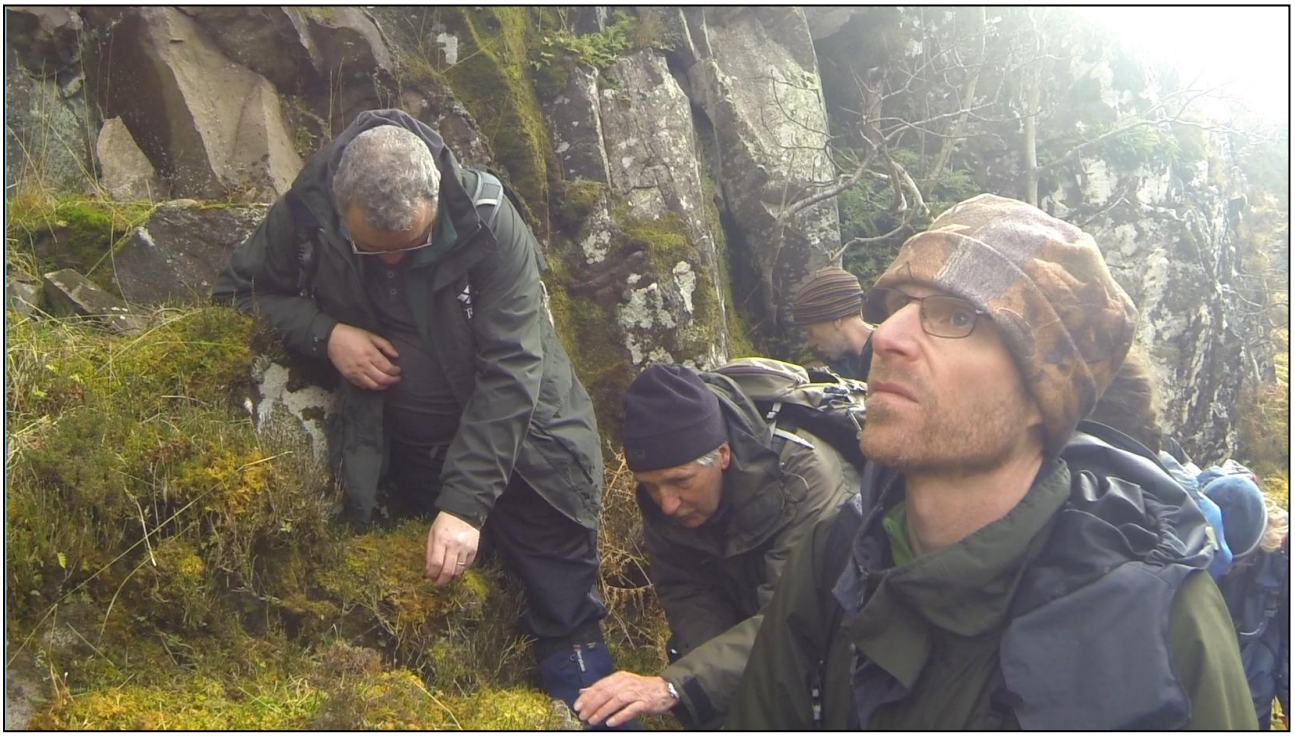
We scrambled down to the base of a nearby crag, which supports a 'woodland' of aspen, birch, holly and rowan, and an assortment of ferns, mosses, lichens and blueberry. Is this a relic of a larger area of woodland which was formerly present in this area in the past? How long ago?



I suggest (*below*) that [here] there are trees everywhere, nutrients are everywhere and that the survival of this patch of woodland is because the fires have not reached it. There was a wildfire by Poolewe a few years earlier which burnt a large area, however several similar patches of woodland survived.



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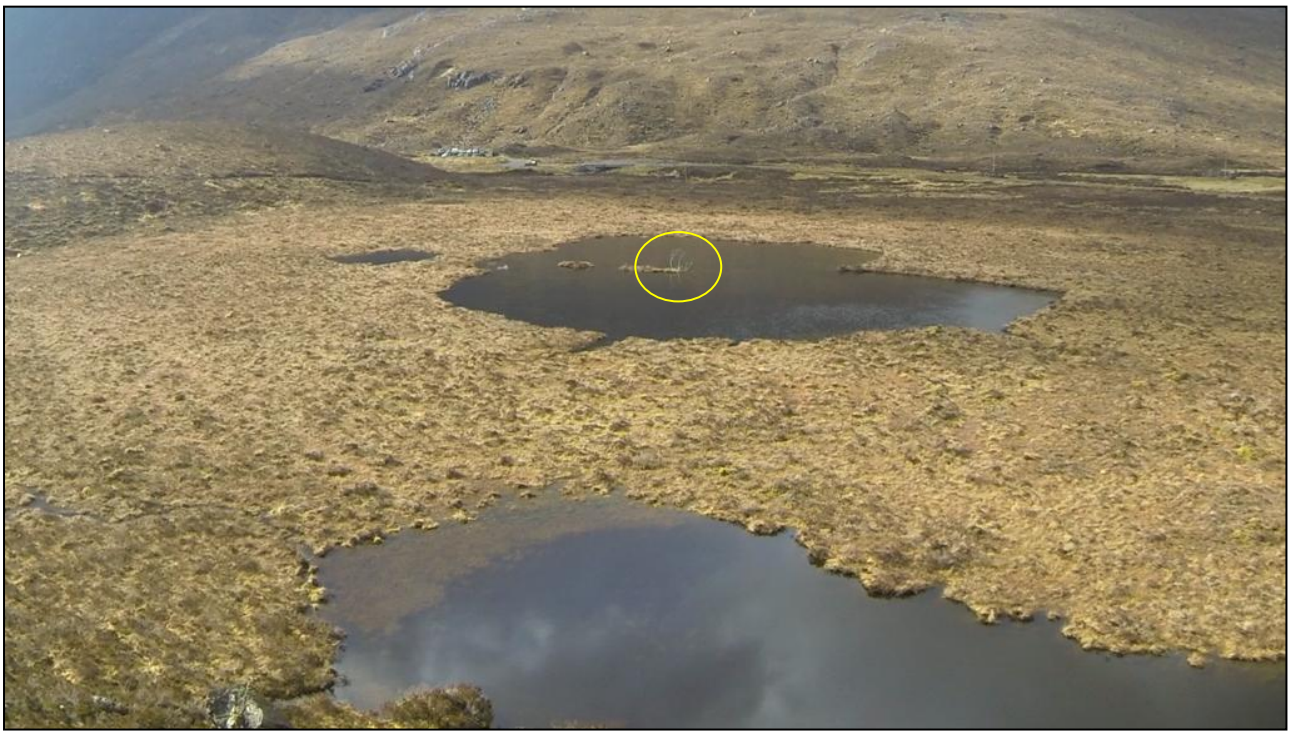
From the base of the crag we looked back towards the car park, over two lochans. On the second lochan there is a peaty island with a birch tree growing in it *(below).* How come?



We discuss the tree on the way back and suggested that possibly otter or occasional wildfowl have enriched the soil here enabling the tree to grow [along with associated myccorhizal fungi . . . ?]

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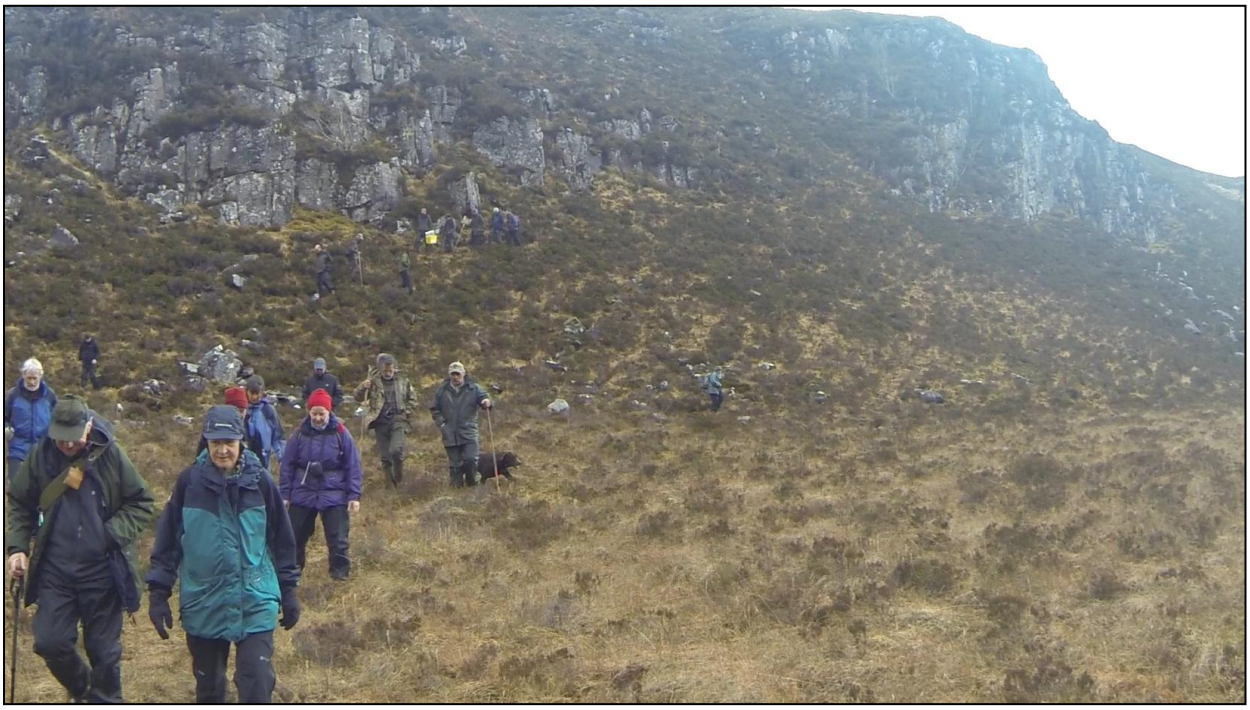
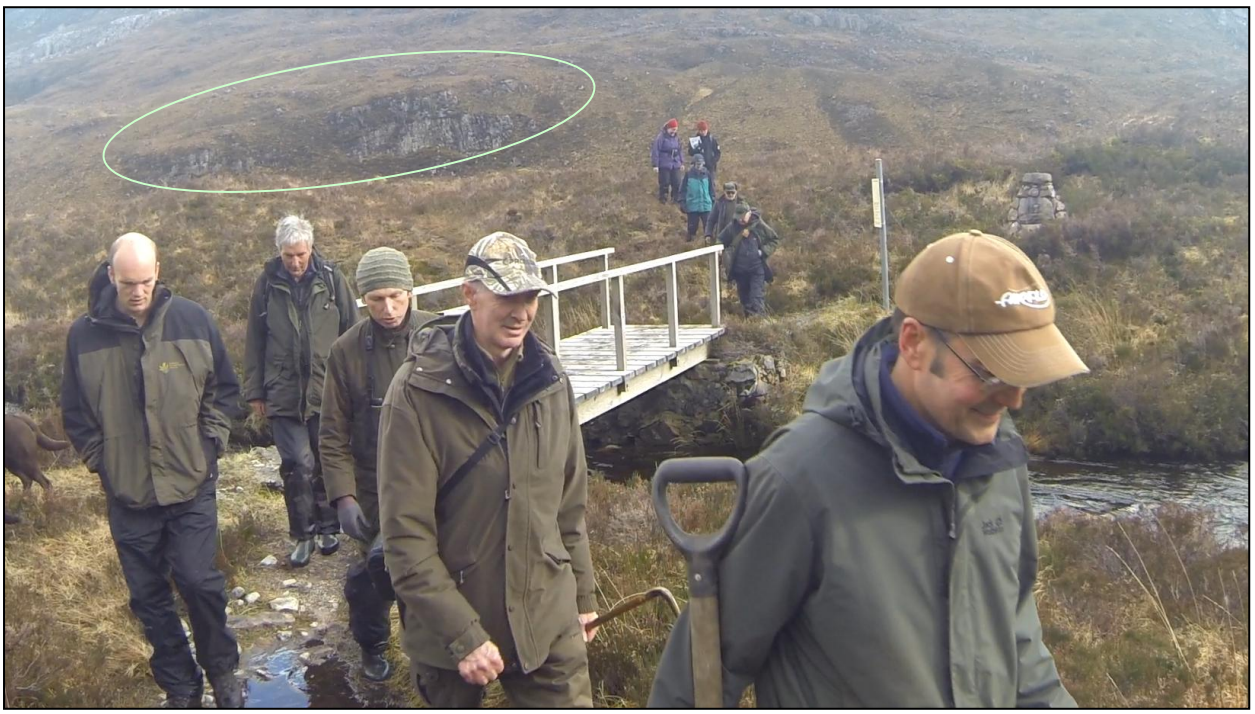
Looking back at the crag, note that the heather below the crag is very bushy.



Heading back to the car park (*below*). Looking back at the woodland on the crag (above footbridge in picture below), its isolation can be seen: there are no other trees for several hundred metres around it.



Thank you to Peter Duncan & Doug Bartholomew (SNH), Seamus MacNally (NTS Torridon) and Charlie Hill (Ben Damph estate) and everyone else for coming along and contributing to the discussion.

Pictures from GoPro video footage by Peter Cunningham, info@wrft.org.uk

[End of Field trip]