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Twenty one Scottish snow patches survive until winter 2014/15

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Here we present our nineteenth annual report on the survival of Scottish snow patches, following the account for 2013 in Cameron *et al.* (2014).

Methods

Observations by enthusiastic amateurs form the basis of this report. Many of these contributors carried tape-measure and notepad, making measurements far more reliable. Unattributed observations are by authors IC, AW and DD, information from others being personal communications. Measurements of patches give greatest length, breadth and depth in that order.

Weather in winter through to autumn

The extraordinary winter was dominated by westerly winds, bringing heavy rainfall to most of the UK, but falling as snow in the Highlands generally only above 600 metres. On 17 December a series of Atlantic storms began, which deposited huge amounts of snow on western hills. Though not as much reached the hills of east and north-east Scotland, very deep drifts were in evidence on many east-facing aspects. By the time these storms abated, in early March, it was clear to seasoned observers that snow quantities in long-lying hollows generally exceeded those of all years since 1994. Early March was to be the last time when any big storms occurred, however, with subsequent falls being light and short-lived compared with what had gone before.

April to July inclusive were all warmer than the 1981–2010 mean throughout much the country (only the month of May had values *less* than 1.5 deg C above the 1981–2010 mean). Fresh snow lay on two days during June, but none in July. August was cool by comparison, and for the sixth year in succession snow fell in that month, as observed on Ben Macdui and Ben Nevis on the 19th and the 23rd. Unusually there were no days in September when fresh snow was noted.

Patches in late spring, summer and autumn 2014

Mid April–July

Southern Scotland

In April, many hills across the region carried large patches. The biggest of these, at Broad Law's Polmoor Crag, was visited on 12 April by IC and R. Dolder, and found to be in the region of 400 metres long. On another trip of 17 May it had shrunk to 40 x 25 x 2 metres, and melted by the end of the month, as did the nearby patch at Donald's Cleuch Head. The former was the last to melt in the Southern Uplands.

West and Central Highlands

In Perthshire, on the sub-914 metre (3000 foot) hills of Sròn a' Chaoineidh and Meall nan Eanchainn of Glen Almond, huge wreaths were seen on 31 May by IC (see Fig. 1), and which persisted until around 20 July, an extremely late date by modern standards. On Ben Vane of the

Arrochar Alps, a patch lasted until 3 July, and until 13 July on nearby Beinn Ime. At Cruach Ard near Crianlarich, a small fragment was observed in the north-east corrie on 22 July, and we judge that it survived until only a few days thereafter. Also near Crianlarich, the patch known locally as Cuidhe Chrom on Ben More was visited by IC on 5 July, and found to be 140 x 40 x 2 metres. It finally succumbed on 22 August.

Argyll's highest mountain, Bidean nam Bian, had on 22 July a huge snow-field extending some 250 metres from near the summit ridge to the floor of Coire nam Beitheach. On 26 May, a massive wreath, some 300 metres long, lay in Coire an t-Sneachda (corrie of the snow) of Beinn Mhanach. This patch, viewed again on 21 July and still 40 metres long, finally melted sometime in mid-August.

East Highlands

The annual survey of the north-east Highlands, undertaken for many years by AW on 1 July, was accomplished on this date by AW, IC, D. Pyper, M. Atkinson and G. McCabe on hills near Glenshee ski centre, and by DD on Ben Macdui. The numbers and total lengths of patches exceeded those in recent years considerably, and were especially conspicuous on the hills of central Perthshire around Glen Almond, despite the long distance from the Glenshee hills. Along the Mounth from Glas Maol east to Lochnagar, some unusually long deep wreaths lay in corries facing north-west.

At Ciste Mhearad (Cairn Gorm), H. Rennie visited on 7 July and observed a large patch of snow, several metres deep, and bigger at that date than any time since 2000. At Ben Wyvis on 28 July, C. Anton found a small patch of snow at Coire nan Con, but on the corrie's north face at NH467689, and 'not at the usual location'. It disappeared by the end of the month.

Long-time resident of Deeside, J. Robertson, stated in a personal communication to AW that the snow-patch known locally as the Cuidhe Crom (crooked wreath, a reference to the shape the snow takes in spring and summer) was larger in July than at any time he had ever seen.

August and September

All-Scotland survey in late August

The seventh all-Scotland survey since 2008, organised by IC, took place on 22 August. A huge total of 281 patches was observed across Scotland. The amount and location of them were as follows: Southern Highlands, 4; Glen Coe and Black Mount, 33; Ben Nevis range and Lochaber, 94; Creag Meagaidh and Laggan area, 26; Drumochter (including Ben Alder), 46; Cairngorms and Lochnagar, 65; North-West Highlands, 12. In the six previous years (2008–2013) the number of patches had been 34, 35, 34, 36, 72 and 81. The 281 patches counted in this August survey almost exceeded the combined total of the previous 6 years (292).

West and Central Highlands

G. Paton saw a wreath at the usual location on Sgùrr nan Clachan Geala of Glen Cannich, on 5 August. A subsequent visit by A. Butler on 15 September revealed only two small fragments, and we judge that these, the last snows north of the Great Glen, would have gone by the 20th. On the hills of Glen Lyon in Highland Perthshire, a patch was observed in the high bowl of Coire Cruach Sneachda of Carn Maing on 9 August, but was not seen on the survey of 22 August, probably melting just a few days before.

On 19 August, A. Todd was walking on Geal Charn at Ardverikie and encountered a large patch of 60 x 30 x 2 metres on the north-east side of the hill. Whilst observing this wreath, he stated that it was 'more like a cold day in October than August', and noted fresh snow falling amid a biting north wind. Confirmation of this snow lying on the 19th was given by R. Scott, who passed a photo of the summit plateau of Ben Nevis to IC.

Two days later, IC visited Meall Ghaordaidh in Breadalbane. The shallow corrie high on the north-east side of the hill held a small patch of 8 x 6 x 0.3 metres, which would have disappeared shortly thereafter. On Meall a' Bhuiridh at Glen Coe ski area, the last remnant of the once-exceptional cover there succumbed on the wet and mild evening of 27 September.

At the foot of Zero Gully on Ben Nevis, B. Fyffe saw a patch on 7 September some 50 metres long, and several metres deep. This snow normally vanishes in mid-August. Huge patches were observed on nearby Aònach Beag and Aònach Mor on 12 September. The so-called Piranha patch, named after the rock climb above it, was 136 metres in length, though less deep than the nearby Protalus patch (see Fig. 2) at 90 x 40 x 4 metres.

East Highlands

In 2013, the snow at Coire Bhathaich of Carn na Caim vanished on 15 August. On 9 August of 2014, however, IC visited the same location and measured the snow as over 100 metres long. A. Barbour went to Ciste Mhearad on Cairn Gorm on 2 August and also found a wreath in excess of 100 metres long. At the other Cairngorms' Ciste Mhearad, on Carn Ban Mor above Glen Feshie, H. Rennie found on 4 August a very large patch of 230 x 80 x 2 metres. Despite its impressive size, the exposed nature of the site resulted in rapid diminution during mild weather, and it vanished altogether by 3 September (A. Kish).

S. Grant observed various patches and their disappearance dates from his house in Inverdrue near Aviemore. On Cairn Gorm, snow at Coire Laogh Mor vanished on 15 September, and at Coire an t-Sneachda, just two days later on 17 September. At Braeriach's Garbh Choire Mor on 9 August, the so-called Sphinx and Pinnacles patches were still deeply conjoined, and a large patch of avalanche debris remained on the corrie floor.

On Lochnagar above Deeside, large wreaths were observed on the headwall of Coire Lochan nan Eun on 8 August. However, these diminished greatly in mild weather during the early part of the month, and by the time of the survey date they were all small. The last snow on this hill, a small sliver at the foot of Parallel Gully A, vanished on 3 October.

October and November

West Highlands

At Bidean nam Bian in Glen Coe, the last surviving patch finally vanished on 15 October. On the north-east face of Ben Nevis, B. Fyffe visited Zero and Point 5 gullies on 1 October. At the former he noted a large patch, estimated at 40-50 metres long. Just over a month later on 5 November, he returned and found the snow at Point 5 Gully to be large and deep (see Fig. 3), and at Zero Gully split in two. All three, however, survived until lasting winter snow came.

L. Brand visited Ben Nevis on 13 and 14 October. At the upper Observatory Gully area, where snow generally lies longest on the hill, a large patch of 60 x 40 x 5 metres was seen and photographed on the 14th. On the previous day he visited two large patches in Coire na Ciste, near Glover's Chimney, both of which also survived until lasting winter snows.

M. Atkinson made a trip to Aònach Beag and Aònach Mor on 4 October and found several wreaths on each. The largest on the former, at the bottom of the cliffs of the north-east face, was much too large for his 30 metre tape measure, and he estimated it at well over 100 metres long, and a certainty for survival. On the latter, the Protalus patch was still completely intact, with no visible signs of the usual late-season splitting. The adjacent Piranha patch was also noted as 'deep and wide'. Though this patch subsequently split in two, both of these and the Protalus patch survived, as well as an additional two on Aònach Beag's An Aghaidh Garbh.

East Highlands

At Coire Bhathaich on Carn na Caim, A. Todd went on 12 October and measured a wreath at 45 x 30 x 3 metres. Although impressive in size, ensuing mild weather reduced it to 15 metres long

by 27 October, and it had gone completely by 10 November. On 24 October, A. Kish visited Ben MacDui and measured the patch at Feith Buidhe slabs as 4 metres deep. The nearby Garbh Uisge Beag snow amounted to just 8 x 4 x 0.6 metres on the same day. This snow melted completely in very mild weather six days later, as did the nearby patch at Coire Domhain. The snow at Feith Buidhe slabs persisted, and is the only known instance of it lasting longer than the one at Garbh Uisge Beag (AW). It also survived until lasting winter snow.

S. Grant reported that the last patch at Braeriach's Coire an Lochain vanished on 23 October. At the other Coire an Lochain, north of the Cairn Gorm plateau, two small segments of a former larger wreath were seen on 25 October (A. Kish), both of which would have persisted until 3 November, when fresh falls buried them. These falls missed the tiny patch on Beinn Mheadhoin, whose last snow disappeared on 11 November. The patch at Ciste Mhearad on Cairn Gorm eventually melted on 29 November, only four days short of being buried by new-season falls.

On 5 October, IC and B. Fyffe visited Garbh Choire Mor and saw three large remnants. The Sphinx patch, Britain's most durable, was 26 x 10 x 4 metres, and the Pinnacles one 32 x 10 x 3. The patch below Michaelmas Fare had a maximum width of 15 metres and approximately 2 m depth. All survived to lasting winter snows on 3 November.

At Creag Meagaidh, a visit on 28 October revealed a wreath of 28 x 20 x 2.5 metres, at the top of Raeburn's Gully, which also persisted until lasting winter snow.

Conclusions

Twenty one patches survived until the following winter's snows. Eight were on Ben Nevis, three each on Aònach Beag and Aònach Mòr, one on Creag Meagaidh, three on Ben MacDui/Cairn Gorm and the other three on Braeriach. Lasting snow came to Ben Nevis, Aònach Beag, Aònach Mòr, Creag Meagaidh and Feith Buidhe slabs on 4 December. At Braeriach and Coire an Lochain of Cairn Gorm, lasting snow arrived on 3 November.

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Figure 1. Remnants of the massive falls of winter 2013/14 glint in the late-spring evening sun of 30 May, at Sròn a' Chaoineidh, Glen Almond, with this 400 metre long wreath. (© Iain Cameron)

Figure 2. Taken from a drone, this picture of Aònach Mor from 12 September shows the snows of Coire an Lochain below the 100 metre cliffs. Three patches here survived until lasting winter snow on 4 December. (© Iain Cameron)

Figure 3. Guy Steven practices some ice-climbing moves on 5 November at the large patch left at Point 5 Gully, Ben Nevis (© Blair Fyffe)

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