

## Bawhelps, Bodnasparet and Craigie Thieves (7A)

Report of surveys carried out by Alan Dawson on 8 May 2014

### Background

The main purpose of this day's surveying was to return to Bawhelps to measure its height and drop to find out whether it has the 30 metres drop required to retain its Sim status. Surveys were also carried out on Bodnasparet, a marginal Sim, to verify whether it has 30m drop, and on Craigie Thieves, a marginal Hump, to verify whether it has 100 metres drop. All three hills lie near the northern end of Glen Prosen and are outlying tops of Mayar. They were approached from the long track that runs from Glen Isla between Crock and Hare Cairn toward Glenmarkie Lodge. Heights were measured using a Leica Geosystems RX 1250 GPS antenna and controller, with subsequent processing using OS Rinex data to obtain precise results. Conditions for the surveys were fair: clear and calm but dull with showers.

### Bodnasparet survey (hill 4112)

This hill was the first of the day and was reached via its long south ridge, which runs between Badandun Hill and Glen Finlet. On OS maps its summit has a 679m spot height and there is a 645m spot height at the col, giving it a drop of 34 metres, so with four metres to spare it was expected that the survey would verify its Sim status. There is an old cairn on its summit, but the highest point was found to be an unmarked patch of heather about 12m south of this. Its col is very well-defined and consists of a small area of flat peat alongside a broken-down wall.

Summit feature: Heather

Summit survey time: 30 minutes

Antenna height at summit: 0.91m

Margin for error: 0.06m

Base station data:

<i>Base station:</i>	BRAE	DUDE	KILN	KINT
<i>Distance away:</i>	21	48	76	74
<i>Summit ellip height:</i>	729.811	729.977	729.806	729.847
<i>Col ellip height:</i>	694.066	694.127	694.066	694.113

Col survey time: 25 minutes

Antenna height at col: 0.80m

Margin for error: 0.03m

Only the four nearest base stations were used for processing as all others were over 90km away.

Mean elliptical summit height: 729.86m

Mean elliptical col height: 694.09m

WGS84 to OSGB36 adjustment: 52.687 for summit, 52.701 for col

Adjustment constant: 0.16m



Bodnasparet summit survey in progress, with Bawhelps behind

**Result:**

Summit: 677.33m  
Latitude: 56° 48' 36.86084" N  
Longitude: 3° 16' 26.47177" W  
Summit gridref: NO 22311 69472  
Col: 641.55m  
Col gridref: NO 21904 69611  
Drop: 35.8m  
Outcome: No status change, Bodnasporet remains a Sim, with height decreased but drop increased



**Bodnasporet col survey in progress, with Badandun Hill behind**

**Bawhelps survey (hill 3102)**

This hill had been surveyed in November 2013 with an inconclusive result. The summit was measured as 827.7m and the col as 795.9m, giving a drop of 29.8m. However, survey times were necessarily short in November, and the margin for survey error was judged to be up to 20cm. Also, it was uncertain whether the highest point of Bawhelps had been identified, as it has a very flat summit plateau. To complicate matters further, there are two potential col locations of almost equal height - the first survey had found only 7cm difference between them. For the second survey the tripod was set up to the east of the summit fence and track, with a laser level being used to assist in identifying the optimum survey point, and data was recorded for 45 minutes rather than 30. Both cols were also resurveyed, for 40 minutes each, compared to 20 and 30 minutes for the previous survey. With longer survey times and a more convincing summit position, it was hoped that this second survey would produce a conclusive and definitive result.



**Bawhelps summit survey in progress, with Mayar behind**

Summit feature: Heather (tiny cairn built after survey)

Summit survey time: 45 minutes

Antenna height at summit: 0.92m

Margin for error: 0.1m

Base station data:

<i>Base station:</i>	BRAE	DUDE	KILN	KINT
<i>Distance away:</i>	21	48	76	74
<i>Summit ellip height:</i>	880.552	880.62	880.566	880.618
<i>East col ellip height:</i>	850.281	850.322	850.266	850.348
<i>West col ellip height:</i>	850.395	850.466	850.394	850.474

East Col survey time: 40 minutes

Antenna height at col: 0.92m

Margin for error: 0.04m

West Col survey time: 40 minutes

Antenna height at col: 0.92m

Margin for error: 0.08m

Only the four nearest base stations were used for processing as all others were over 90km away.

Mean elliptical summit height: 880.59m

Mean elliptical east col height: 850.30m

Mean elliptical west col height: 850.43m

WGS84 to OSGB36 adjustment: 52.707 for summit, 52.709 for east col, 52.711 for west col

Adjustment constant: 0.16m

#### Result:

Summit: 828.04m

Latitude: 56° 50' 05.242" N

Longitude: 3° 16' 7.548"W

Summit gridref: NO 22683 72199

Col: 797.76m

Col gridref: NO 22792 72771

Drop: 30.29m

Outcome: Bawhelps retains its Sim status as it has over 30m drop



Surveys of Bawhelps west col (left) and the lower east col (right)

#### Discussion

The main difference between the two surveys was in the location of the highest point of Bawhelps. For the first survey, data had been recorded at the fence next to the track that runs over the summit plateau. Subsequent study of large-scale OS maps had indicated that there might be higher ground to the east of the fence, and the second survey showed this to be the case. The first survey gave a height of 827.65m, the second of 828.04m, a relatively large difference of 39cm. This in itself was enough to give Bawhelps 30m drop. The second survey again showed the east col to be slightly lower than the west col, but on this occasion with a height of 797.76m compared to 797.85m for the first survey. The east col is at a well-defined dip in the track, and for both surveys the antenna was set up above a line of tussocky grass in the middle of deep ruts in the track.



The difference of 9cm between the two col surveys is a little higher than might be expected and is assumed to be largely due to the difference in survey times, with data being recorded for only 20 minutes for the first survey but 40 minutes for the second survey. It is assumed that the survey with the longer data recording time gives the more accurate result. Also, the height of the survey pole was measured more precisely for the second survey, using a metal tape rather than relying on the markings on the pole. At the west col data had been recorded for 30 minutes for the first survey and 40 minutes for the second, and the difference between the two surveys was only 4cm, even though the margin for error on the ground was slightly higher at the west col.

### Craigie Thieves survey (hill 4111)

This summit lies 2.5km south-east from Bawhelps. It is separated from Bawhelps by a deep col known as Glack of Balquhader, and this was surveyed first. The col is far more attractive than the summit, which has a high ugly deer fence running along its summit alongside a low electric fence. The summit survey was set up above a small rock in between the two fences, with care being taken to avoid contact with the electric fence. On OS maps the summit has a 689m spot height and the col a 586m spot height, giving a drop of 103m, so the survey was expected to find that the drop was at least 100m.

Summit feature: Small rock by fence

Summit survey time: 30 minutes

Antenna height at summit: 0.80m

Margin for error: 0.05m

Base station data:

<i>Base station:</i>	BRAE	DUDE	KILN	KINT
<i>Distance away:</i>	21	48	76	74
<i>Summit ellip height:</i>	638.778	638.857	638.866	638.821
<i>Col ellip height:</i>	740.524	740.437	740.412	740.399

Col survey time: 30 minutes

Antenna height at col: 0.87m

Margin for error: 0.05m

Only the four nearest base stations were used for processing as all others were over 90km away.

Mean elliptical summit height: 740.44m

Mean elliptical col height: 638.83m

WGS84 to OSGB36 adjustment: 52.629 for summit, 52.655 for col

Adjustment constant: 0.16m

### Result:

Summit: 687.97m  
 Latitude: 56° 48' 55.415" N  
 Longitude: 3° 14' 28.463" W  
 Summit gridref: NO 24323 70009  
 Col: 586.34m  
 Col gridref: NO 23759 70582  
 Drop: 101.64m  
 Outcome: Craigie Thieves retains its status as a Hump, with drop reduced from 103m to 101.6m



Craigie Thieves col survey at Glack of Balquhader (left) and summit survey