

Habitat Monitoring

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Why monitor upland habitats



- High impacts can lead to damage
 - Loss of grazing value
 - Loss of value for wildlife
 - Degraded landscape
 - Water quality and flood attenuation can be reduced

Why monitor habitats?



- Impacts may only cause damage over a long time period
- Visible damage may be the result of historical, not current impacts

Large scale indicators



Large scale indicators



Large scale indicators



Fixed Point Photography



Fixed Point Photography



Best Practice Habitat Impact Assessment



- Standardised quantitative method using samples of habitat
- Relatively easy/expert knowledge not required
- Measures small scale indicators
- Allows changes in impact levels over time to be measured
- Provides a measure of CURRENT impacts

Samples



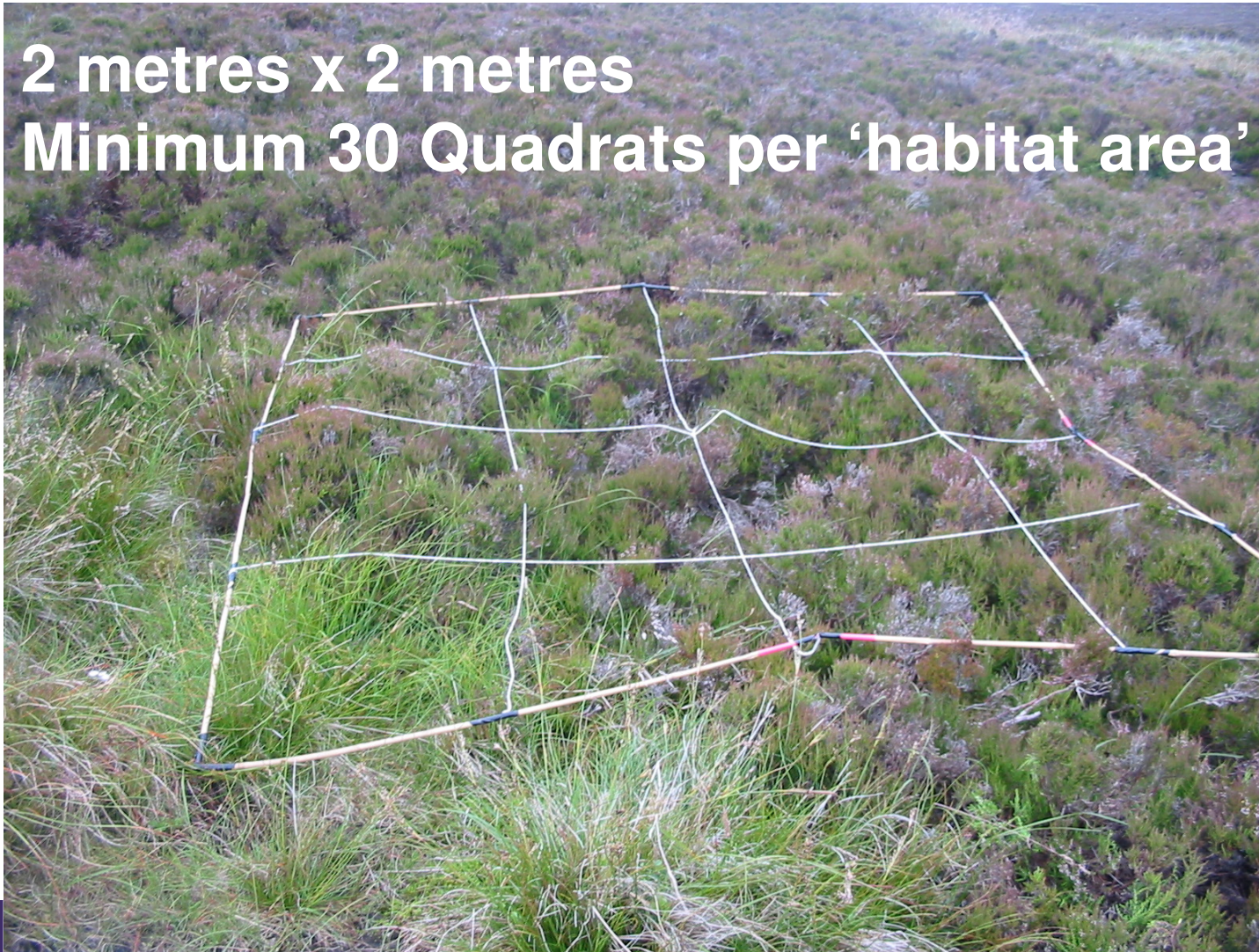
- Variation across areas of habitats means samples must be representative
- Too few samples:
 - may be unrepresentative of habitat as a whole
 - may hide variation across the site
- Too many samples – time constraints

Quadrat – Best Practice Guide



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2 metres x 2 metres
Minimum 30 Quadrats per 'habitat area'



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What is a 'Habitat Area'?

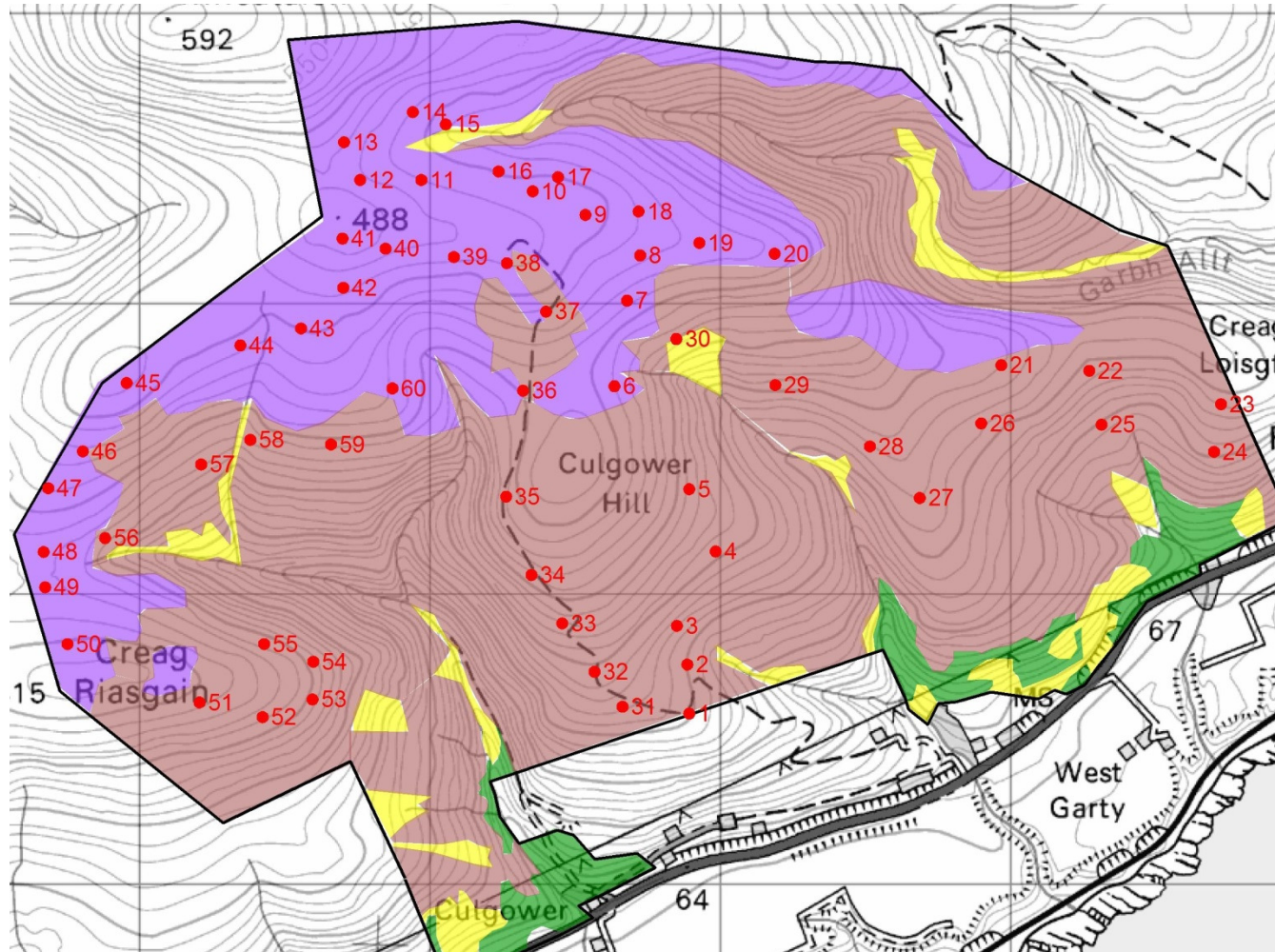


Broad habitat

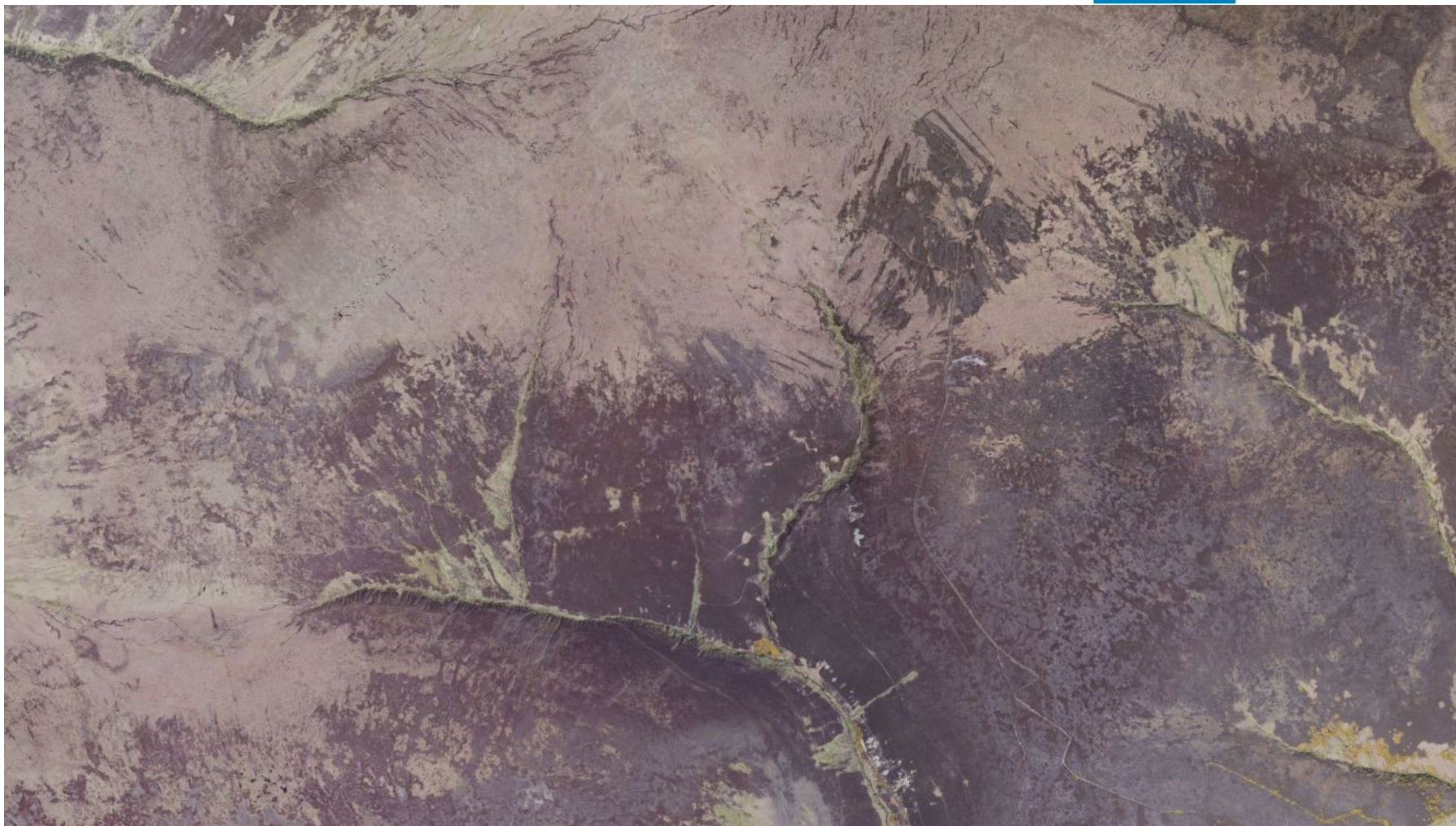
- Dwarf Shrub Heath (? divide into wet and dry)
- Blanket Bog
- (Flush and spring)
- (Native Woodland)
- (Willow Scrub)
- (Tall Herbs)

May need further subdivision in larger areas
2 - 3 plots per square kilometre?

Map of Habitat Areas



Use of Aerial Imagery

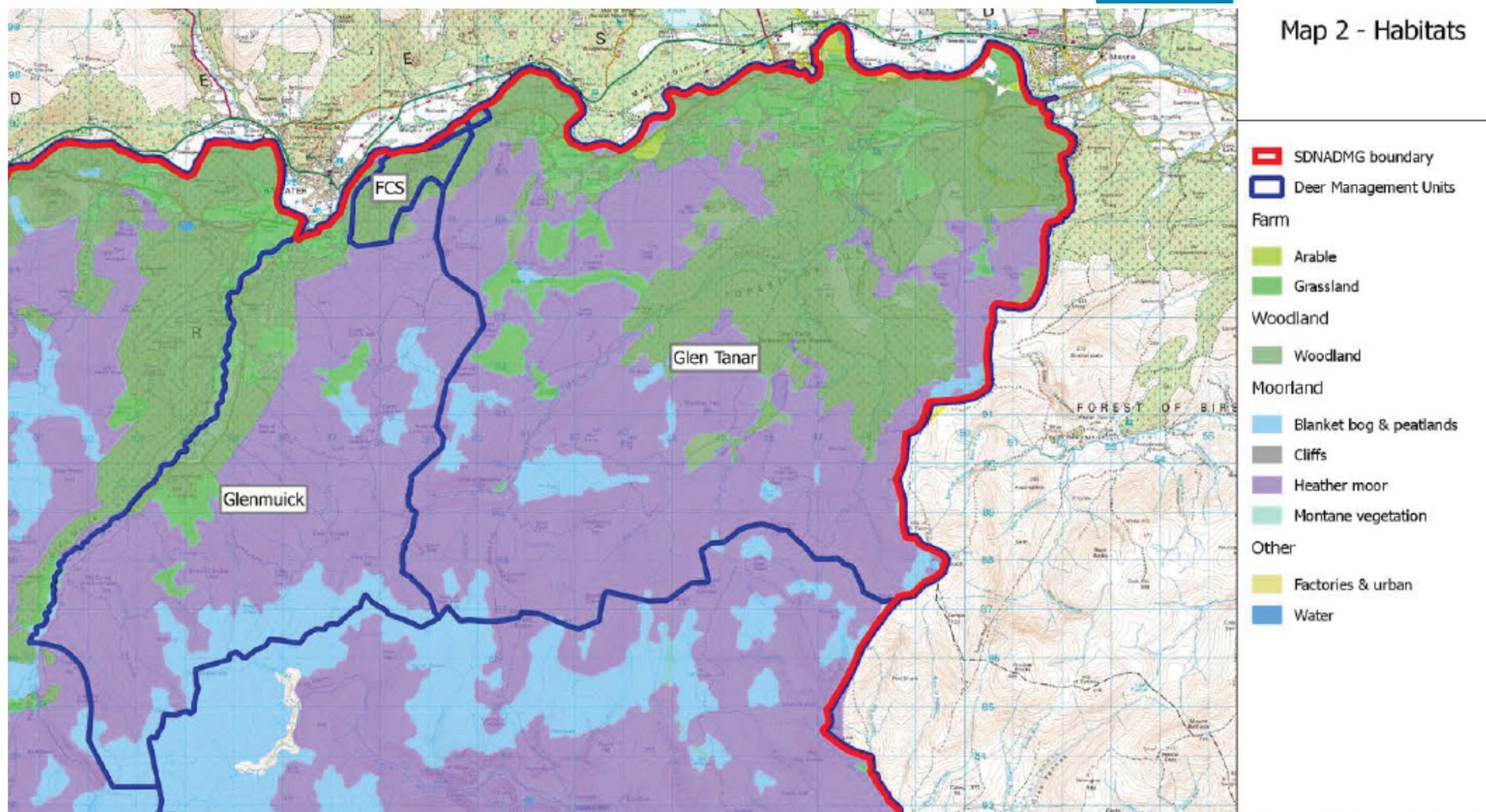


Habitat Map



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Map 2 - Habitats



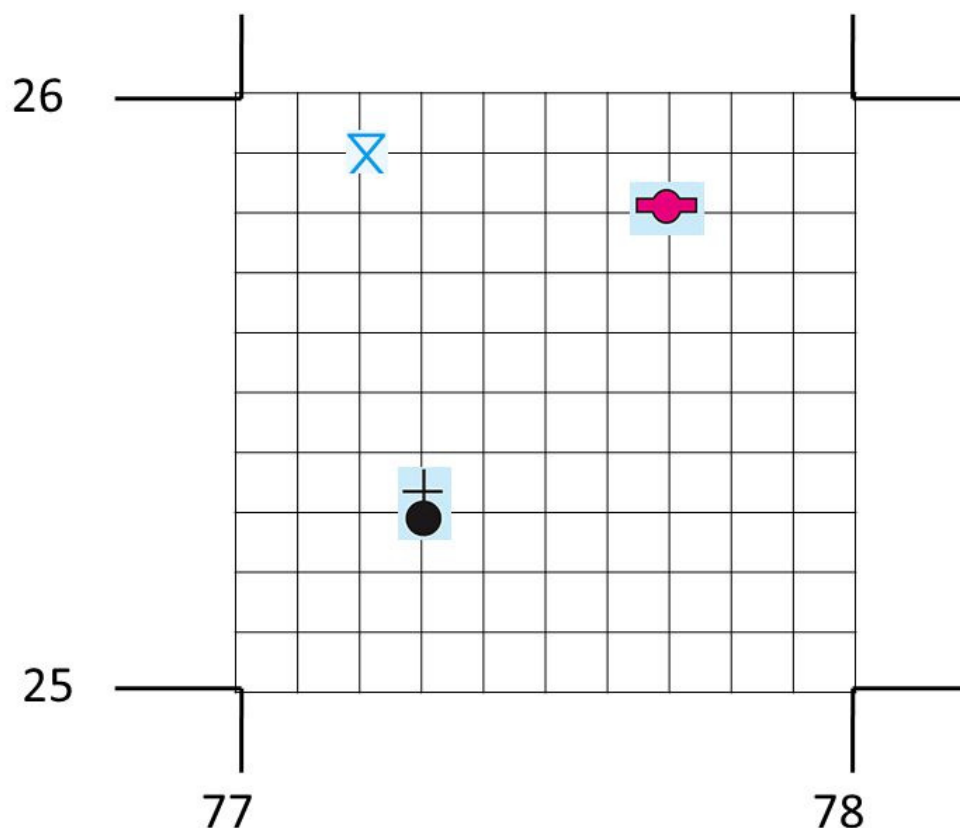
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Locating Quadrats

In order to give something a six-figure grid reference, imagine the larger square split into one hundred smaller squares. Then add numbers 1 to 10 between the main lines.



Marking Quadrats

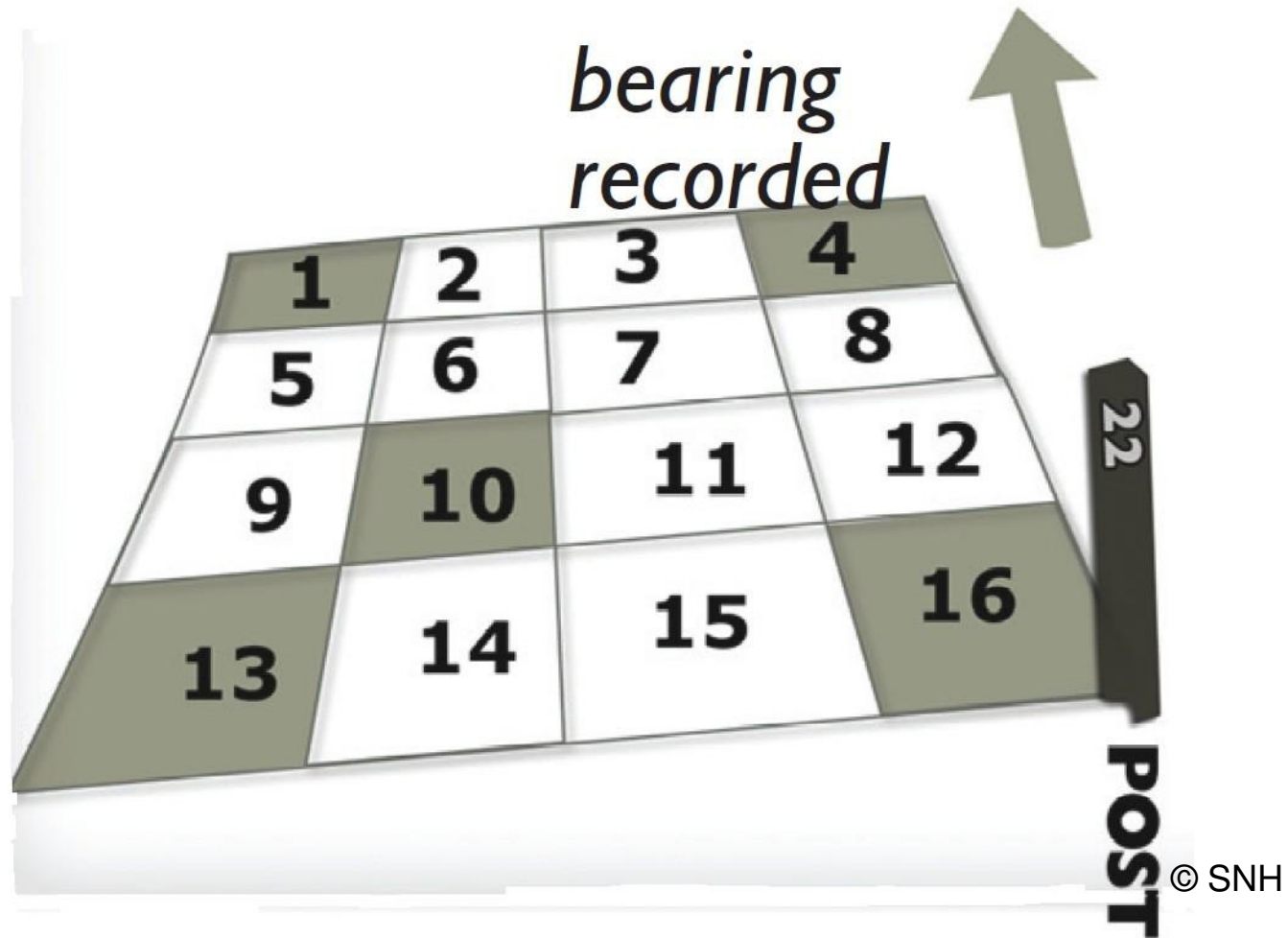


- 5 x 5 x 20cm posts

Best Practice Measurements

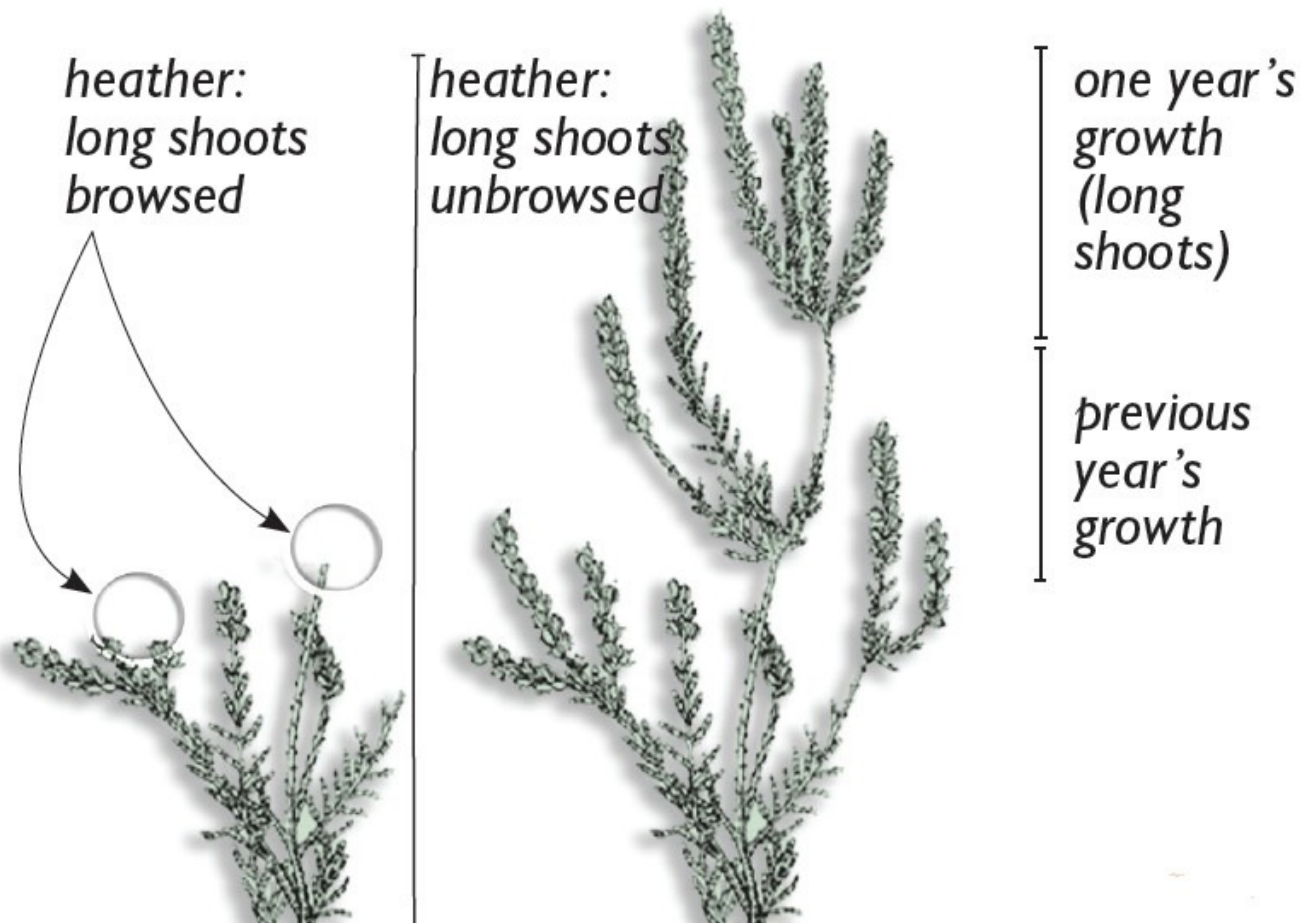


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Browsing

- 3-4 handfuls of heather within each of the five shaded subplots in each plot



Browsing



- LIGHT: <33% long shoots browsed
- MODERATE: 33-66% long shoots browsed
- HEAVY: >66% long shoots browsed
- Categorise plot according to the most frequent category of quadrats.

Browsing

- Give a score of 1 for light, 2 for moderate, 3 for heavy browsing
- Add the scores for the five subplots and divide by 5 to get average browsing score

| Subplot 1 | Subplot 2 | Subplot 3 | Subplot 4 | Subplot 5 | Whole Plot |
|-----------|-----------|-----------|-----------|-----------|------------------|
| Light | Light | Heavy | Moderate | Moderate | Moderate |
| 1 | 1 | 3 | 2 | 2 | $9 \div 5 = 1.8$ |

Vegetation Height



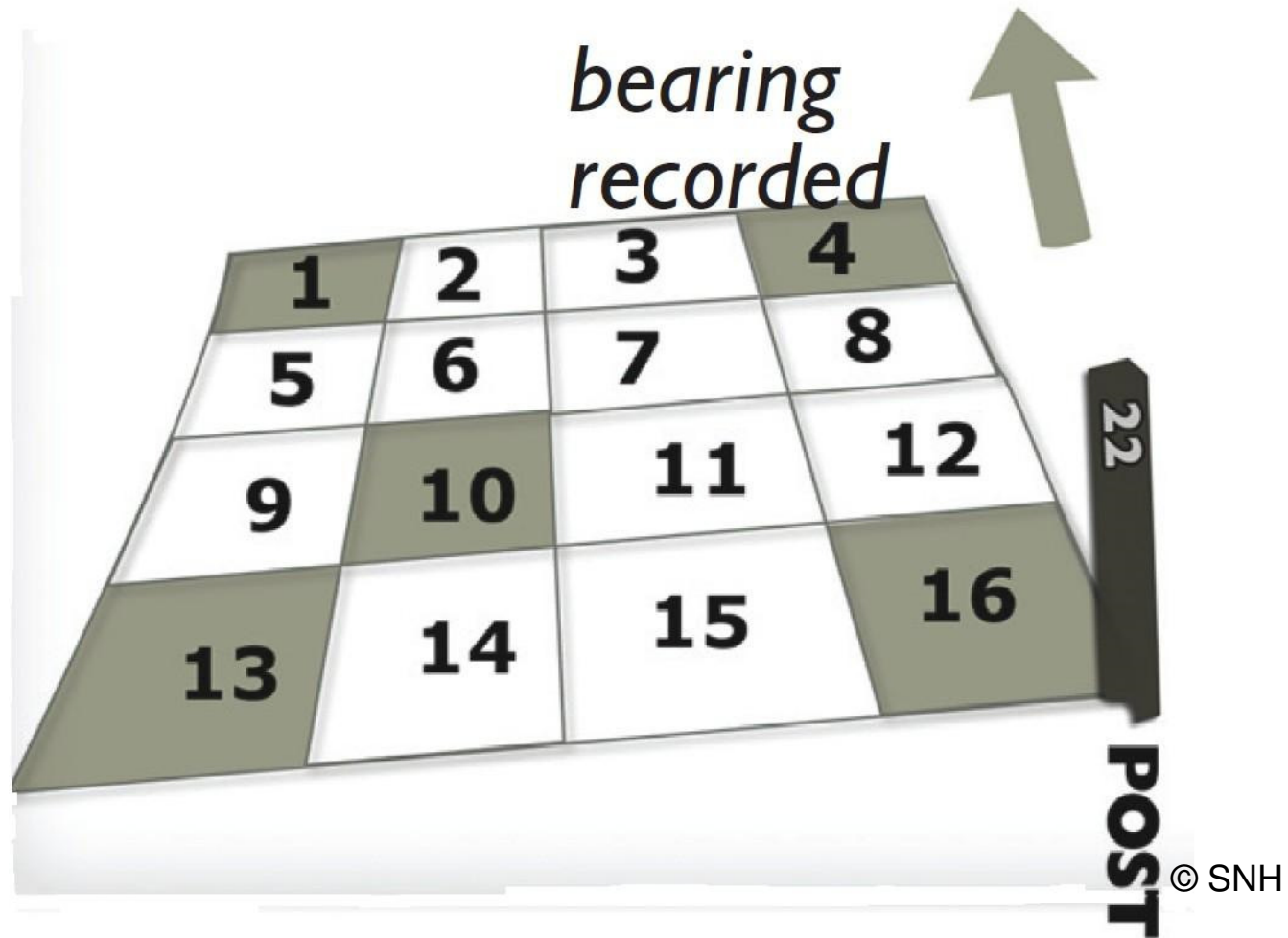
- 3-4 measurements with a tape measure in each of the five shaded subplots in each plot
- Average the heights across plot.



Best Practice Measurements



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Blanket Bog - Trampling



- Bare ground with hoof prints
- Record how many of 16 sub-plots



Blanket Bog – Bog Moss

- Present or absent
- Record how many of 16 sub-plots have sphagnum



Dwarf-shrub heath - Heather distribution



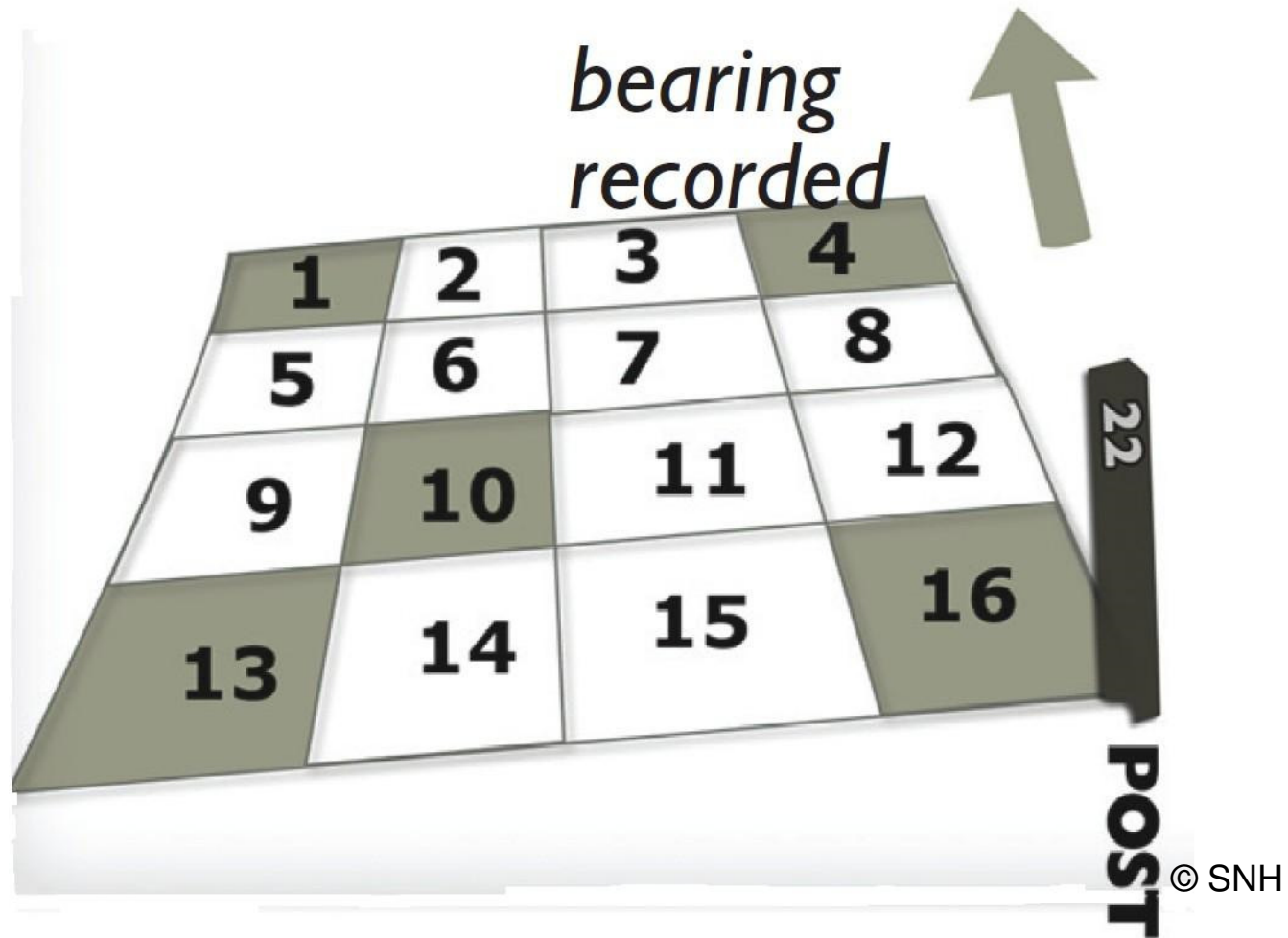
- Record presence of ling heather or blaeberry in each of 16 subplots
- Summarise per plot (how many subplots have heather/blaeberry)



Best Practice Measurements



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Deer and/or Hare dung

- Presence or absence in each plot



Dwarf-shrub heath – Heather stem breakage



Photographic record



- Digital photo of whole plot from fixed point



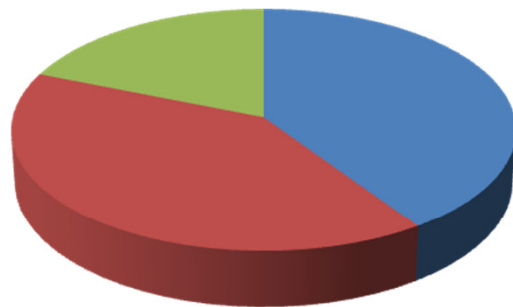
Storing and analysing the results



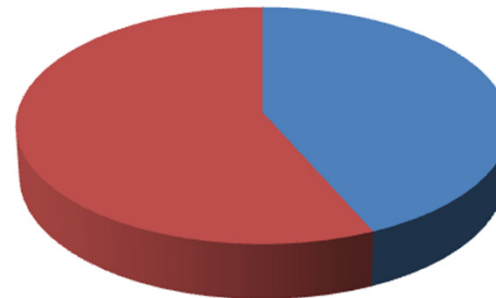
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| PLOT | GRID REF | HABITAT | % Shoots brow sed (/5) | | | Heather present (/16) | Stem breakage (heath only) | | Deer Dung Present | Hare Dung Present | | Average Height (cm) | Surveyor |
|------|----------------|-------------------|------------------------|-------|-----|-----------------------|----------------------------|-------|-------------------|-------------------|--|---------------------|----------|
| | | | <33 | 33-66 | >66 | | Light/moderate | Heavy | | | | | |
| 1 | NC 97895 12585 | Dwarf shrub heath | 1 | 3 | 1 | 16 | 1 | | 1 | 0 | | 12.4 | GMcK |
| 2 | NC 97890 12755 | Dwarf shrub heath | 5 | 0 | 0 | 13 | 1 | | 0 | 0 | | 16.2 | GMcK |
| 3 | NC 97852 12888 | Dwarf shrub heath | 0 | 5 | 0 | 16 | 1 | | 0 | 0 | | 22 | GMcK |
| 4 | NC 97987 13145 | Dwarf shrub heath | 4 | 1 | 0 | 16 | 1 | | 1 | 0 | | 18.8 | GMcK |
| 5 | NC 97894 13359 | Dwarf shrub heath | 1 | 4 | 0 | 16 | 1 | | 0 | 0 | | 18.4 | GMcK |
| 21 | NC 98971 13786 | Dwarf shrub heath | 5 | 0 | 0 | 16 | 1 | | 0 | 0 | | 15 | GMcK |
| 22 | NC 99278 13772 | Dwarf shrub heath | 4 | 1 | 0 | 16 | 1 | | 1 | 0 | | 15.6 | GMcK |
| 23 | NC 99728 13652 | Dwarf shrub heath | 3 | 2 | 0 | 16 | 1 | | 1 | 0 | | 14.8 | GMcK |
| 24 | NC 99704 13488 | Dwarf shrub heath | 1 | 4 | 0 | 16 | 1 | | 1 | 0 | | 11.2 | GMcK |
| 25 | NC 99315 13581 | Dwarf shrub heath | 5 | 0 | 0 | 16 | 1 | | 0 | 0 | | 23.2 | GMcK |
| 26 | NC 98901 13586 | Dwarf shrub heath | 1 | 4 | 0 | 16 | | 1 | 1 | 0 | | 11.6 | GMcK |
| 27 | NC 98689 13329 | Dwarf shrub heath | 2 | 3 | 0 | 16 | 1 | | 1 | 0 | | 11.4 | GMcK |
| 28 | NC 98518 13503 | Dwarf shrub heath | 2 | 3 | 0 | 16 | 1 | | 0 | 0 | | 19 | GMcK |
| 29 | NC 98193 13718 | Dwarf shrub heath | 4 | 1 | 0 | 16 | | 1 | 0 | 0 | | 30.2 | GMcK |
| 30 | NC 97854 13875 | Dwarf shrub heath | 5 | 0 | 0 | 16 | 1 | | 0 | 0 | | 26.6 | GMcK |
| 31 | NC 97666 12609 | Dwarf shrub heath | 5 | 0 | 0 | 16 | 1 | | 0 | 0 | | 12.8 | PCh |
| 32 | NC 97570 12732 | Dwarf shrub heath | 2 | 3 | 0 | 16 | 1 | | 0 | 0 | | 16.4 | PCh |
| 33 | NC 97460 12897 | Dwarf shrub heath | 3 | 2 | 0 | 16 | 1 | | 0 | 0 | | 19.8 | PCh |
| 34 | NC 97351 13065 | Dwarf shrub heath | 3 | 2 | 0 | 16 | 1 | | 0 | 0 | | 25.8 | PCh |
| 35 | NC 97266 13332 | Dwarf shrub heath | 4 | 1 | 0 | 16 | 1 | | 0 | 0 | | 18.8 | PCh |
| 46 | NC 95779 13493 | Dwarf shrub heath | 0 | 5 | 0 | 16 | 1 | | 1 | 0 | | 5.8 | PCh |
| 51 | NC 96210 12624 | Dwarf shrub heath | 5 | 0 | 0 | 16 | 1 | | 0 | 0 | | 4.6 | PCh |
| 52 | NC 96430 12572 | Dwarf shrub heath | 2 | 3 | 0 | 16 | 1 | | 1 | 0 | | 14.8 | PCh |
| 53 | NC 96597 12636 | Dwarf shrub heath | 2 | 3 | 0 | 16 | 1 | | 0 | 0 | | 14.8 | PCh |
| 54 | NC 96598 12763 | Dwarf shrub heath | 0 | 5 | 0 | 16 | 1 | | 0 | 0 | | 11.2 | PCh |
| 55 | NC 96430 12825 | Dwarf shrub heath | 0 | 5 | 0 | 16 | 1 | | 1 | 0 | | 15 | PCh |
| 56 | NC 95885 13190 | Dwarf shrub heath | 0 | 5 | 0 | 16 | 1 | | 1 | 0 | | 28 | PCh |
| 57 | NC 96212 13443 | Dwarf shrub heath | 0 | 5 | 0 | 16 | 1 | | 0 | 0 | | 30.4 | PCh |
| 58 | NC 96385 13528 | Dwarf shrub heath | 2 | 3 | 0 | 16 | 1 | | 0 | 0 | | 28.4 | PCh |

Analysis of results



- Number of plots with less than 33% heather shoots browsed
- Number of plots containing 33-66% browsed
- Number of plots containing above 66% browsed

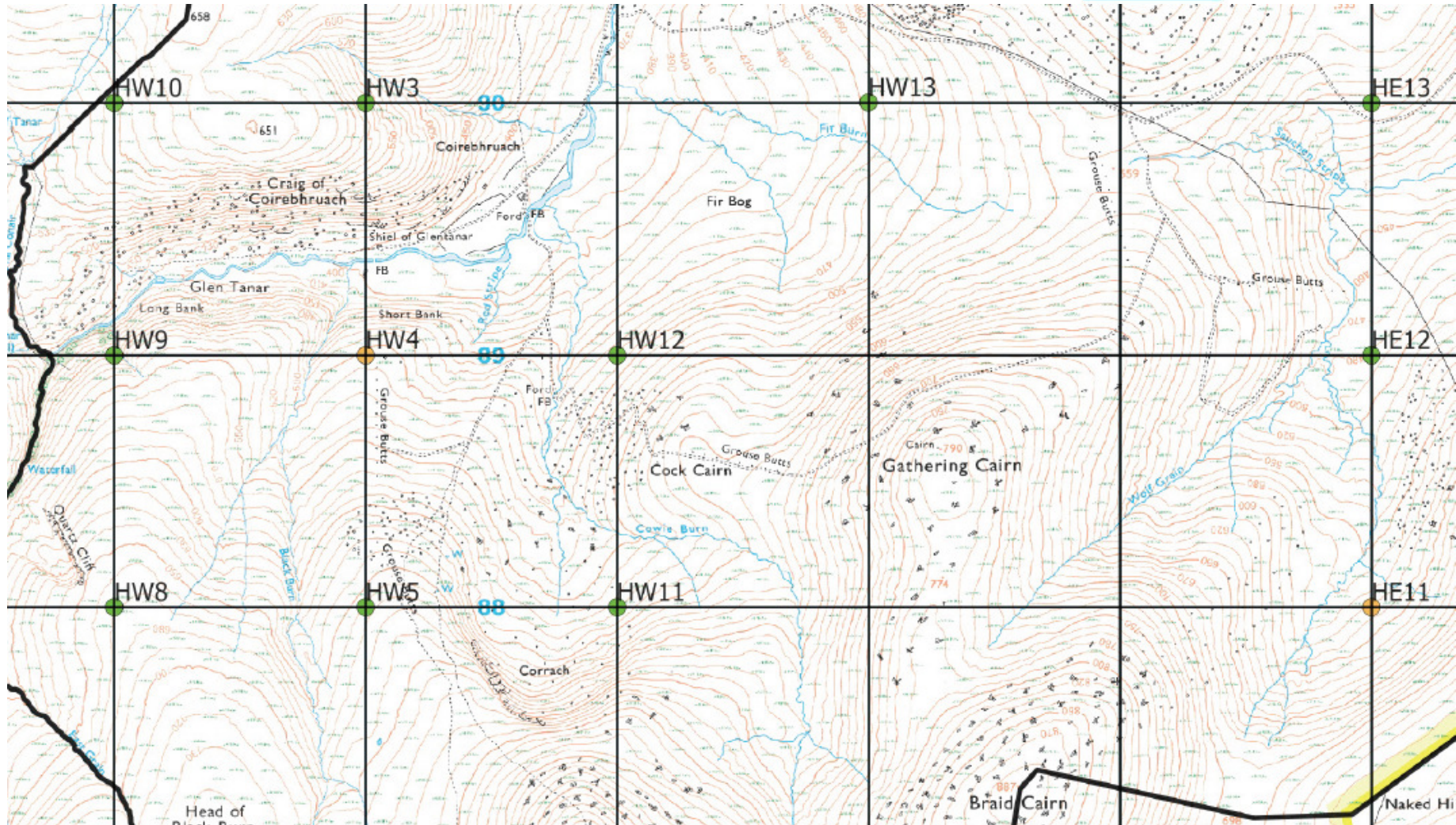


- Hoof marks present
- Hoof marks not present

Analysis of results



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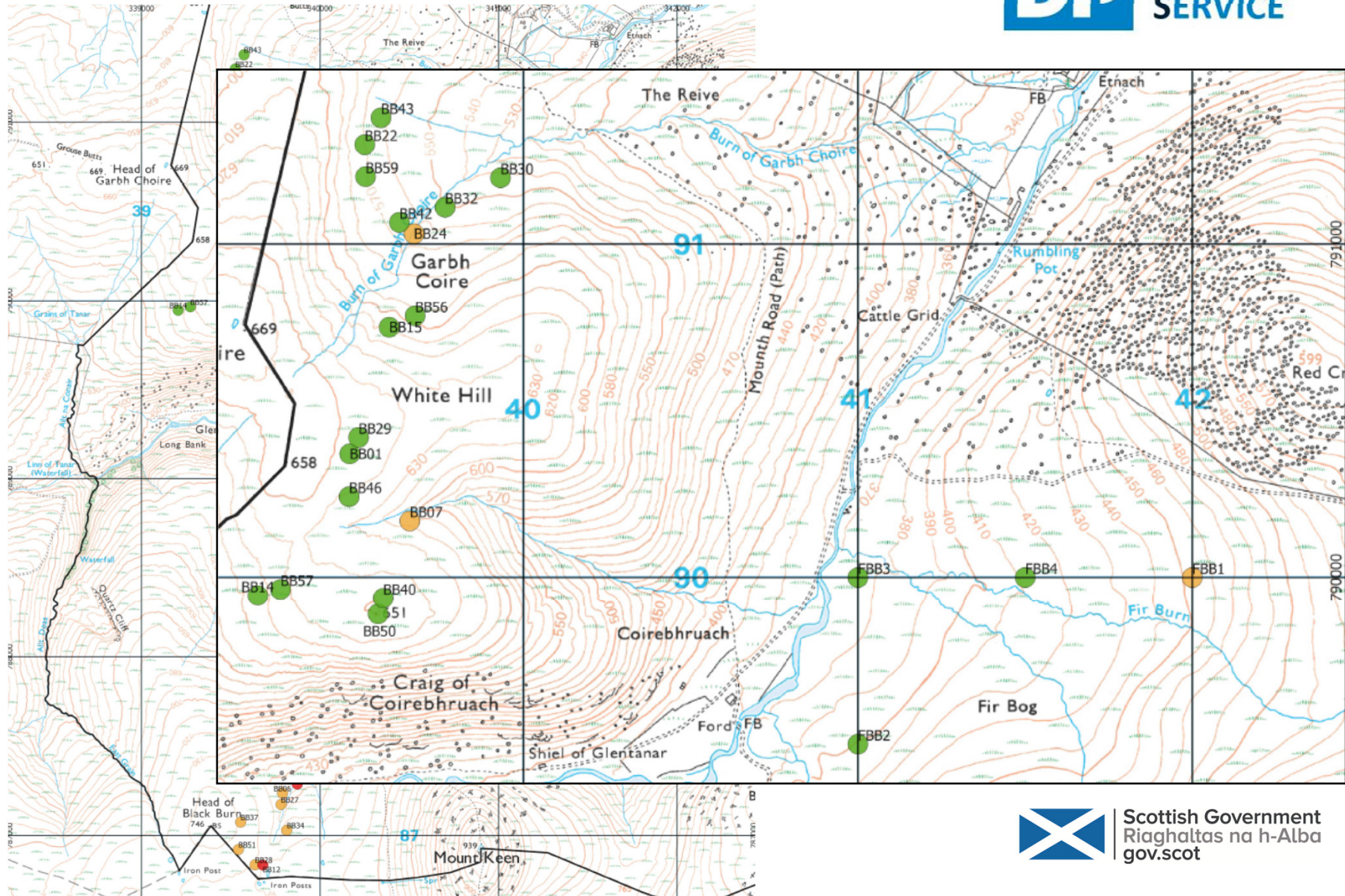
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This topographic map of the Glen Tanar area in Scotland shows a detailed view of the landscape. Key features include:

- Geographical Features:** Glen Tanar, Coirebhuach, Grouse Butts, Head of Black Burn, Mount Keen, and various rivers and burns like the Burn of Garbh Choire and Coire Burn.
- Grid System:** A grid with numbers 39, 40, 41, 42, 89, 90, 88, 87, 91, and 92.
- Landmarks:** Craig of Coirebhuach, Fir Bog, Corrach, and various cairns like Grouse Butts Cairn and Cock Cairn.
- Scale:** A scale bar at the bottom indicates distances in miles (0 to 1) and kilometers (0 to 1.6).



Analysis of results



Analysis of results

