

Habitat Monitoring

Paul Chapman
SAC Conservation Services

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



FARM
ADVISORY
SERVICE



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

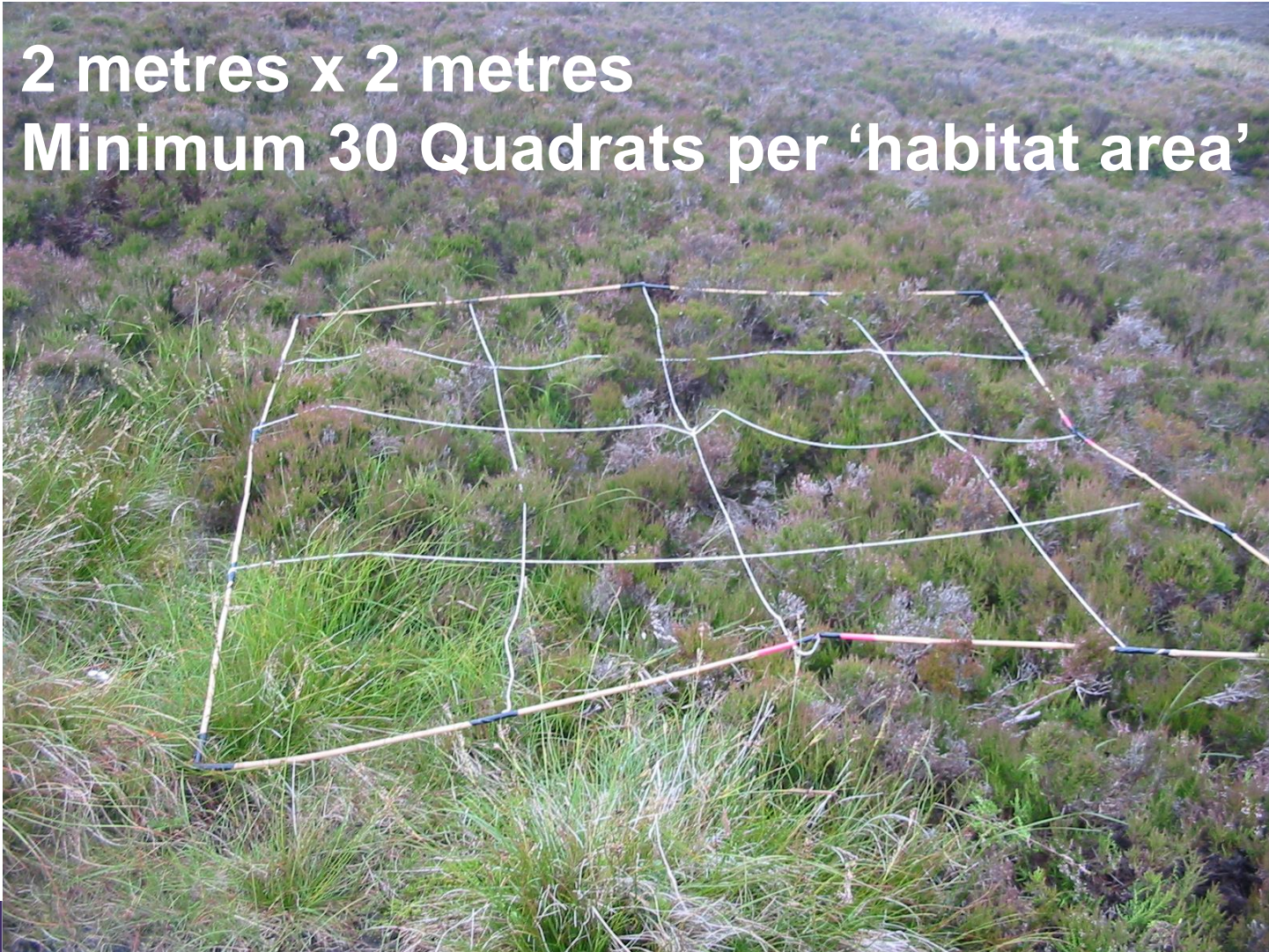
- Variation across areas of habitats means samples must be representative
- Too few samples:
 - may be unrepresentative of habitat as a whole
 - may hide variation across the site
- Too many samples – time constraints

Quadrat – Best Practice Guide



FARM
ADVISORY
SERVICE

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



The European Agricultural Fund
for Rural Development
Europe investing in rural areas

SAC
CONSULTING

gov.scot

Government
na h-Alba

What is a 'Habitat Area'?

Broad habitat

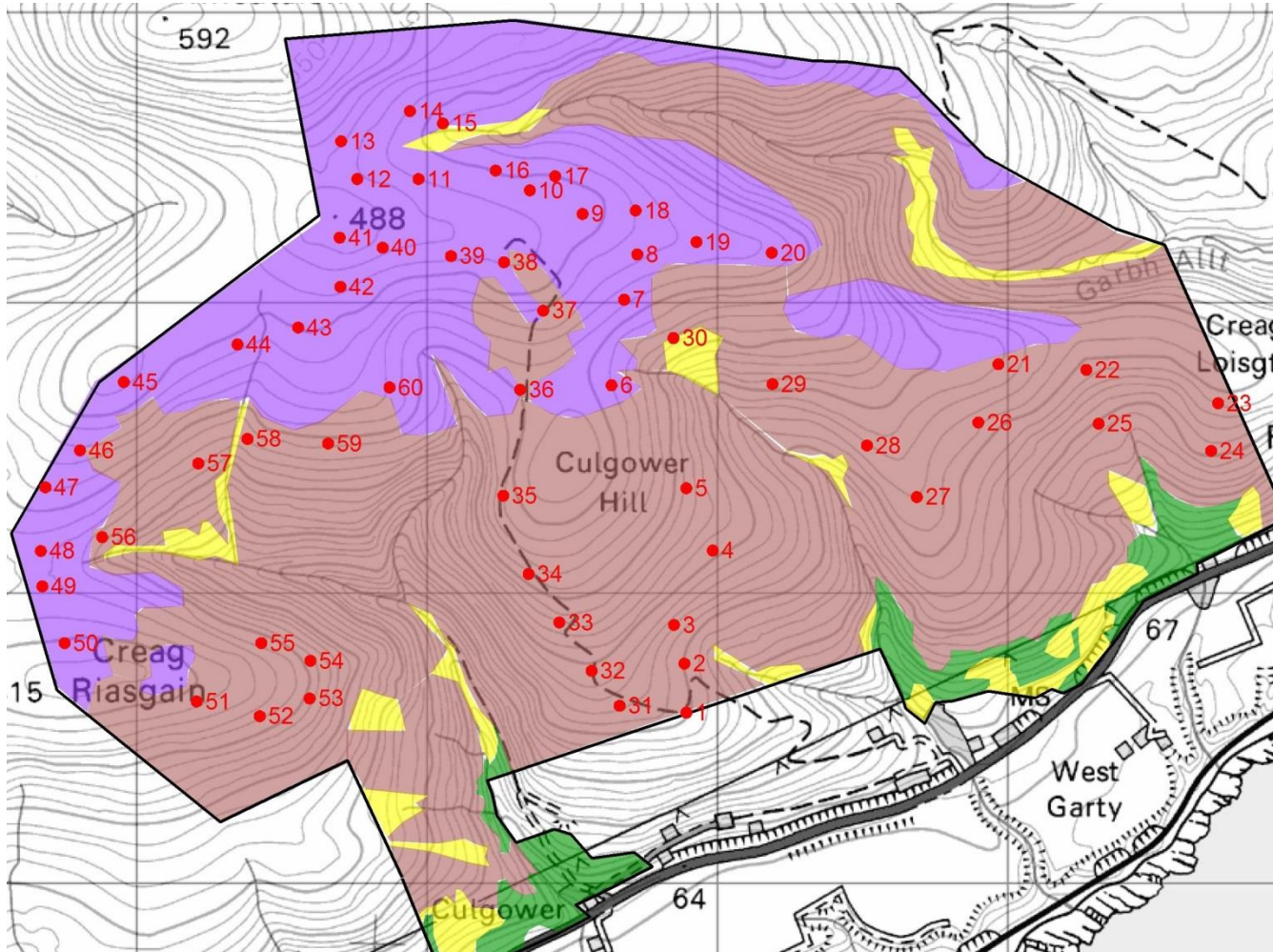
- Dwarf Shrub Heath (? divide into wet and dry)
- Blanket Bog
- (Flush and spring)
- (Native Woodland)
- (Willow Scrub)
- (Tall Herbs)

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

Map of Habitat Areas



FARM
ADVISORY
SERVICE



The European Agricultural Fund
for Rural Development
Europe investing in rural areas



Scottish Government
Riaghaltas na h-Alba
gov.scot

Use of Aerial Imagery



FARM
ADVISORY
SERVICE



The European Agricultural Fund
for Rural Development
Europe investing in rural areas



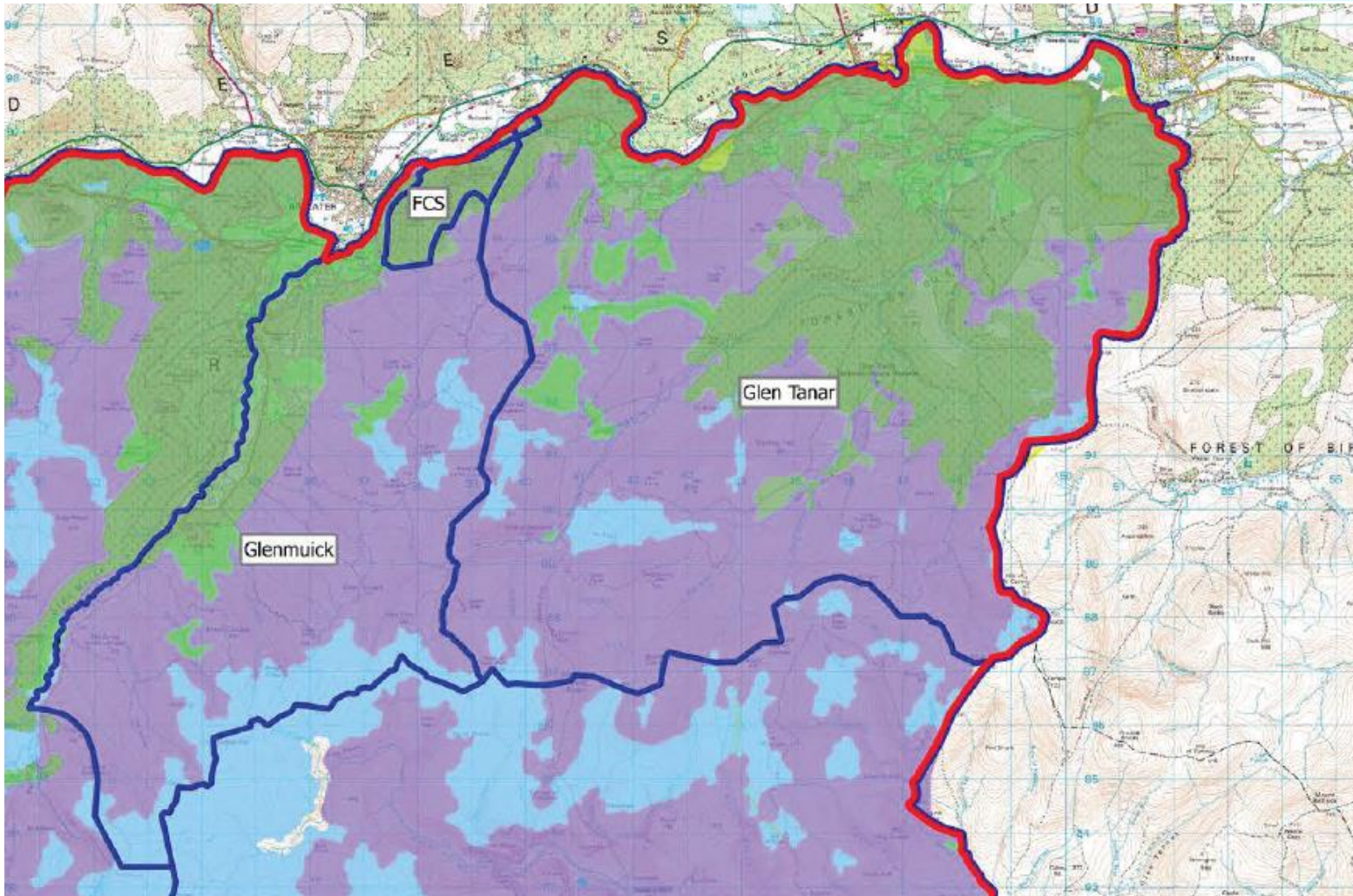
Scottish Government
Riaghaltas na h-Alba
gov.scot

Habitat Map



**FARM
ADVISORY
SERVICE**

Map 2 - Habitats



- SDNADMG boundary
- Deer Management Units
- Farm**
- Arable
- Grassland
- Woodland**
- Woodland
- Moorland**
- Blanket bog & peatlands
- Cliffs
- Heather moor
- Montane vegetation
- Other**
- Factories & urban
- Water



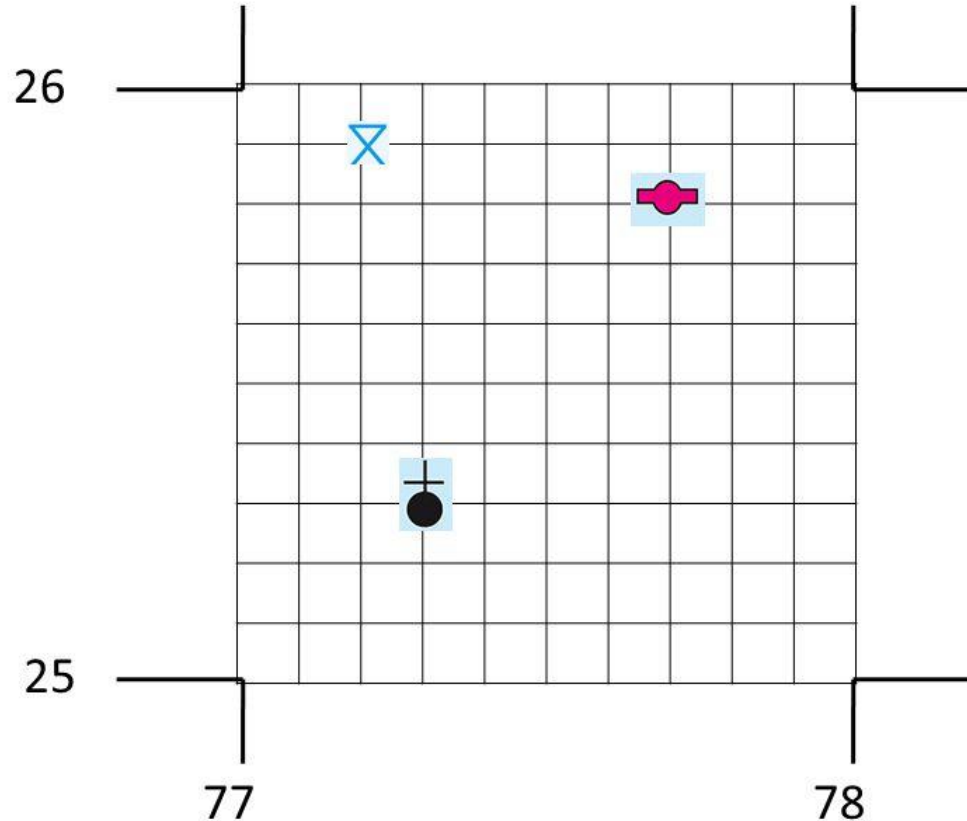
The European Agricultural Fund
for Rural Development
Europe investing in rural areas



Scottish Government
Riaghaltas na h-Alba
gov.scot

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

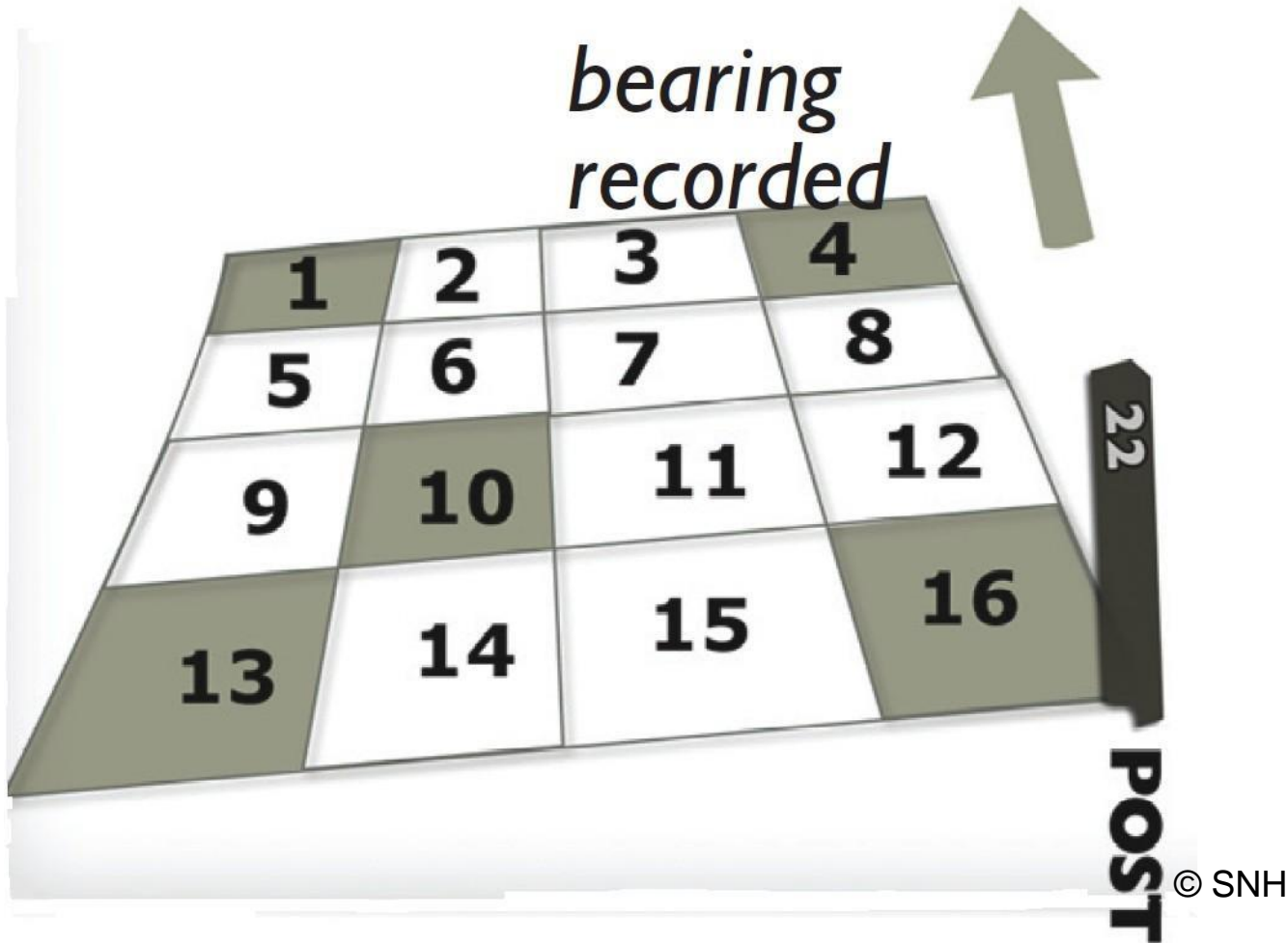


- 5 x 5 x 20cm posts

Best Practice Measurements



FARM
ADVISORY
SERVICE

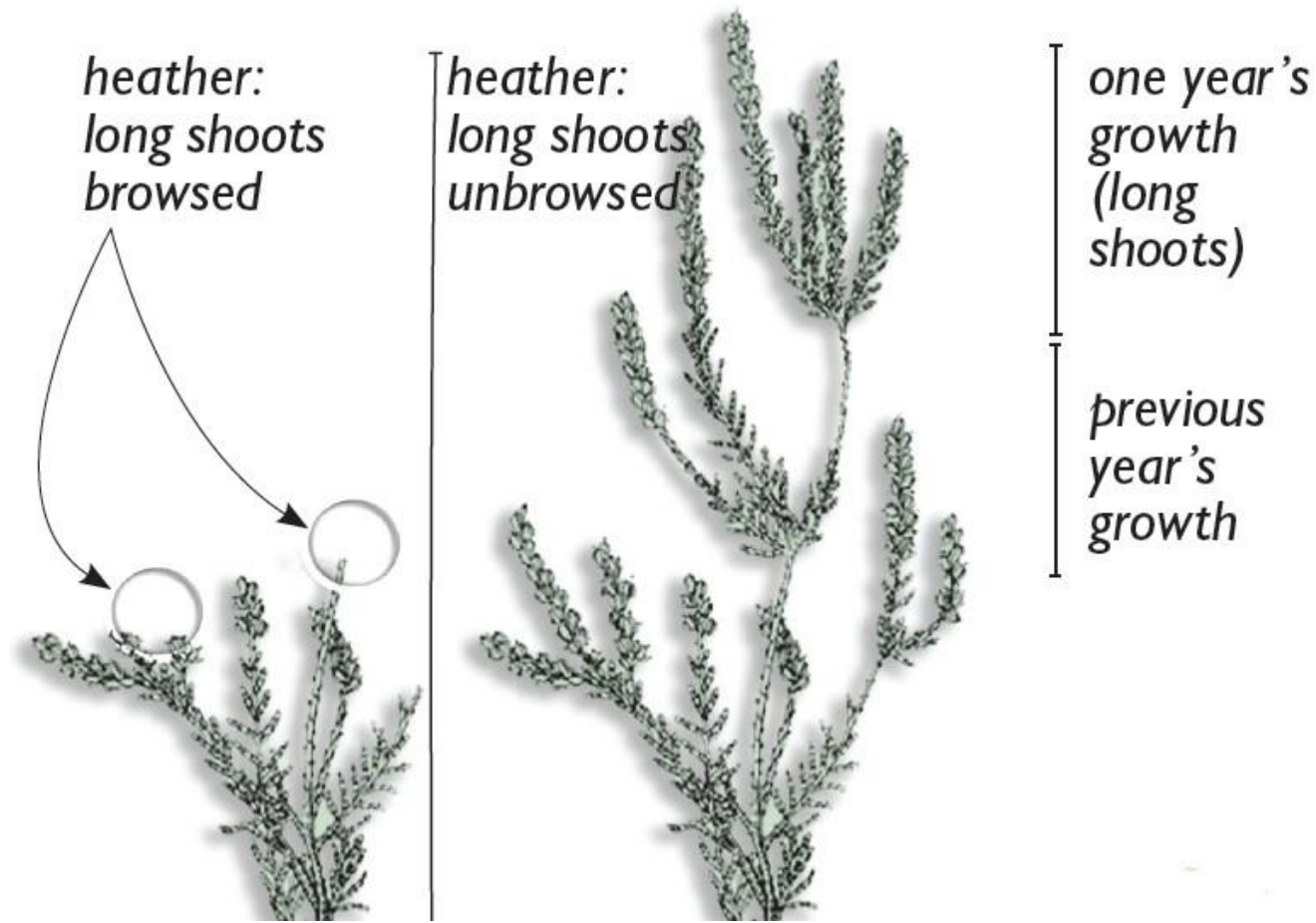


Browsing



FARM
ADVISORY
SERVICE

- 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.

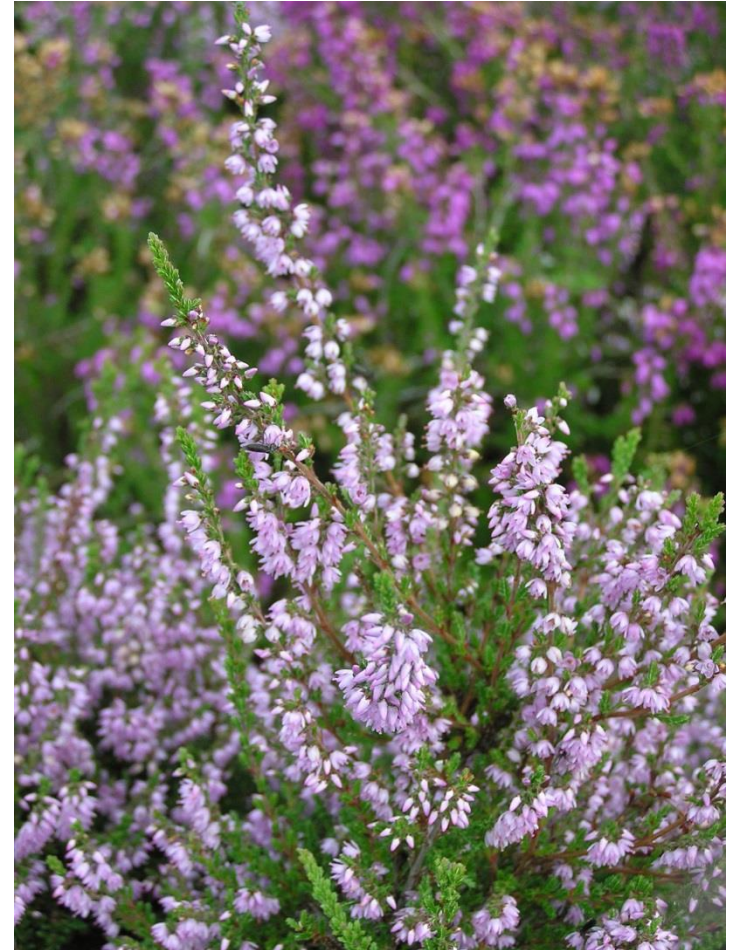
Browsing

- 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

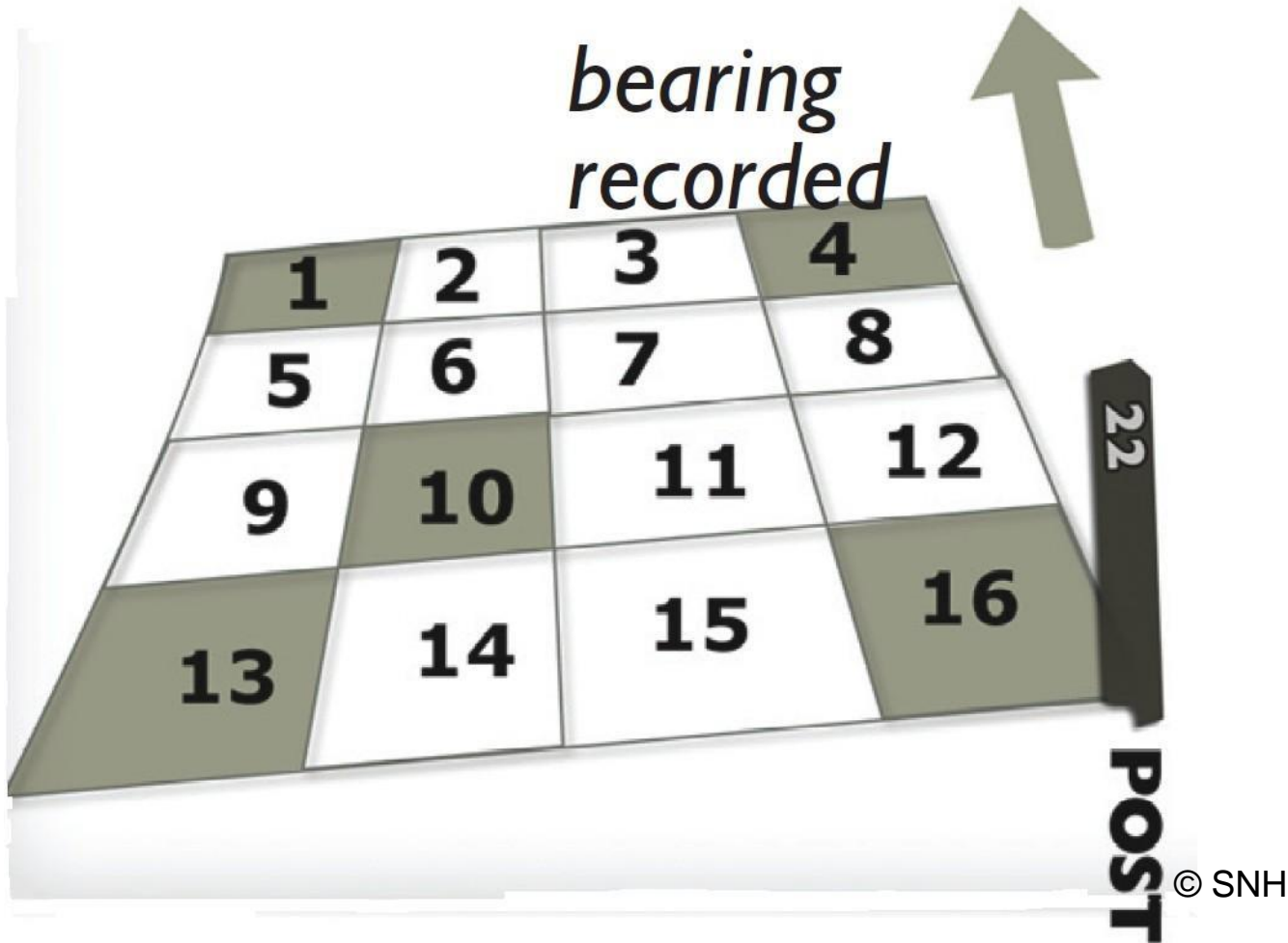
- 3-4 measurements with a tape measure in each of the five shaded subplots in each plot
- Average the heights across plot.



Best Practice Measurements



FARM
ADVISORY
SERVICE



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

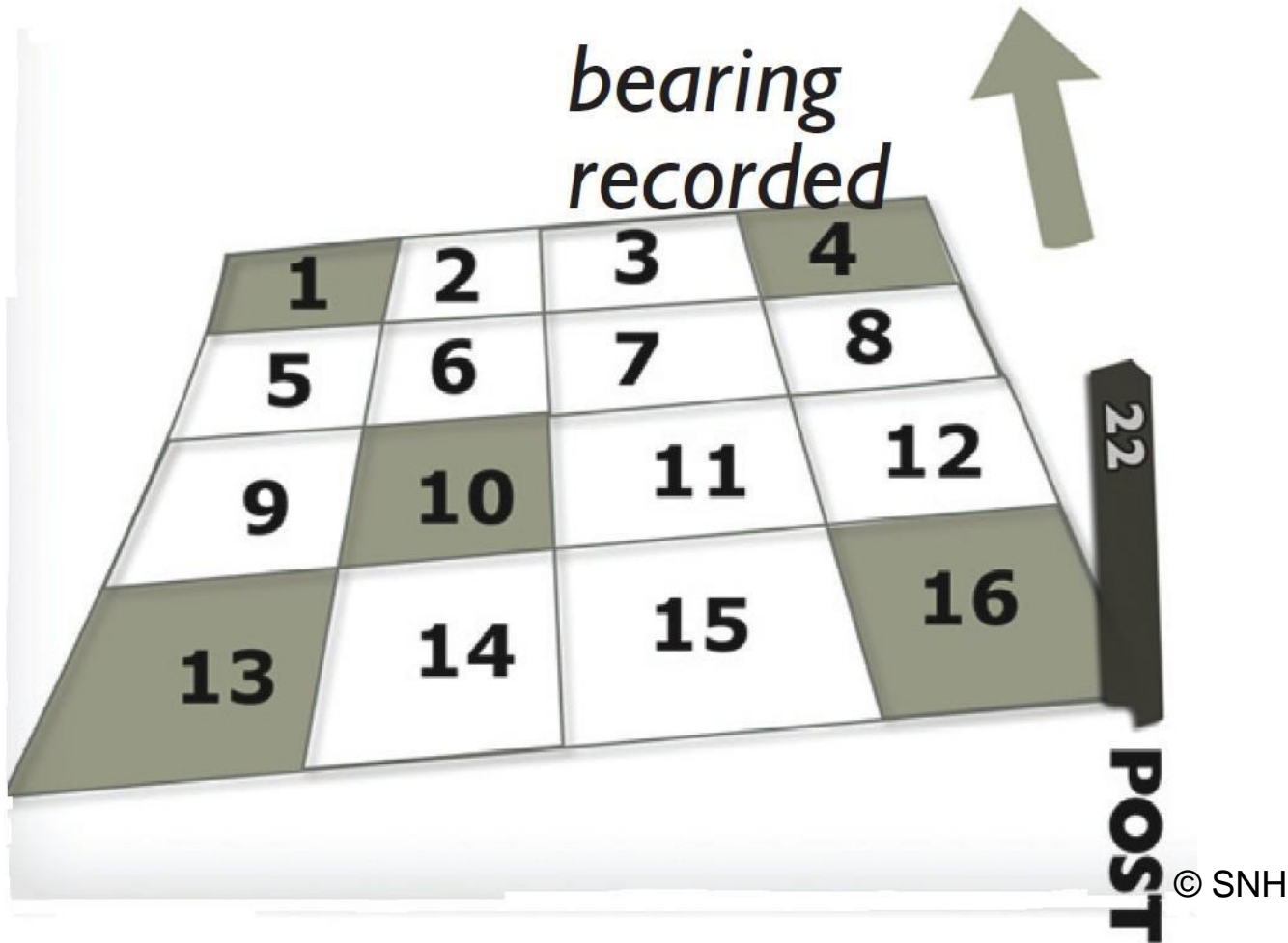
- Record presence of ling heather or blaeberry in each of 16 subplots
- Summarise per plot (how many subplots have heather/blaeberry)



Best Practice Measurements



FARM
ADVISORY
SERVICE



Deer and/or Hare dung

- Presence or absence in each plot



Dwarf-shrub heath – Heather stem breakage

- Light/Moderate
- Heavy



Photographic record

- Digital photo of whole plot from fixed point



Storing and analysing the results



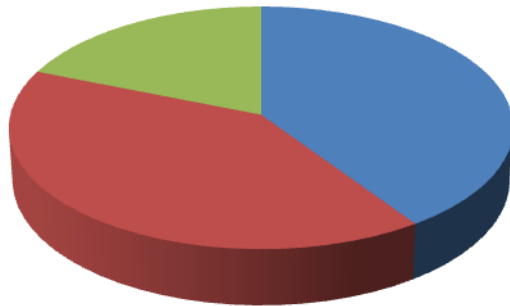
**FARM
ADVISORY
SERVICE**

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

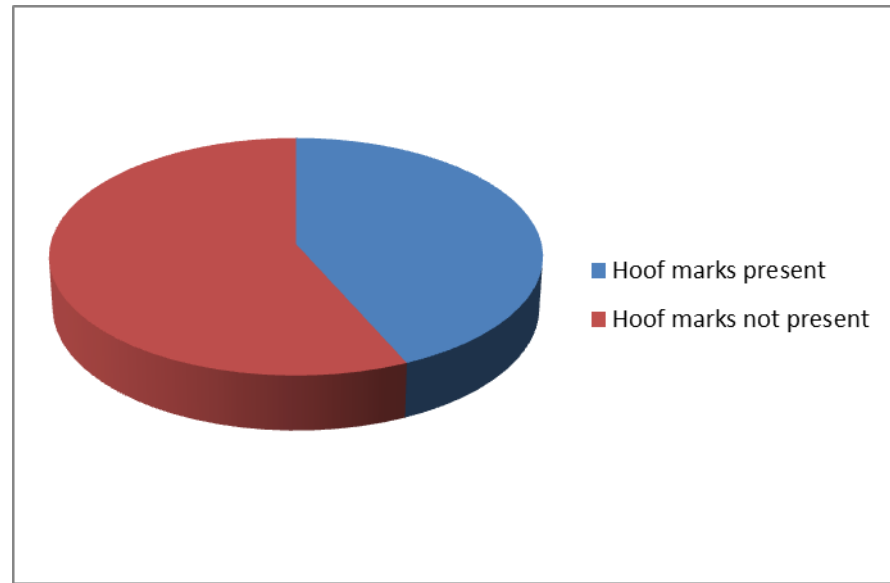


Scottish Government
Riaghaltas na h-Alba
gov.scot

Analysis of results

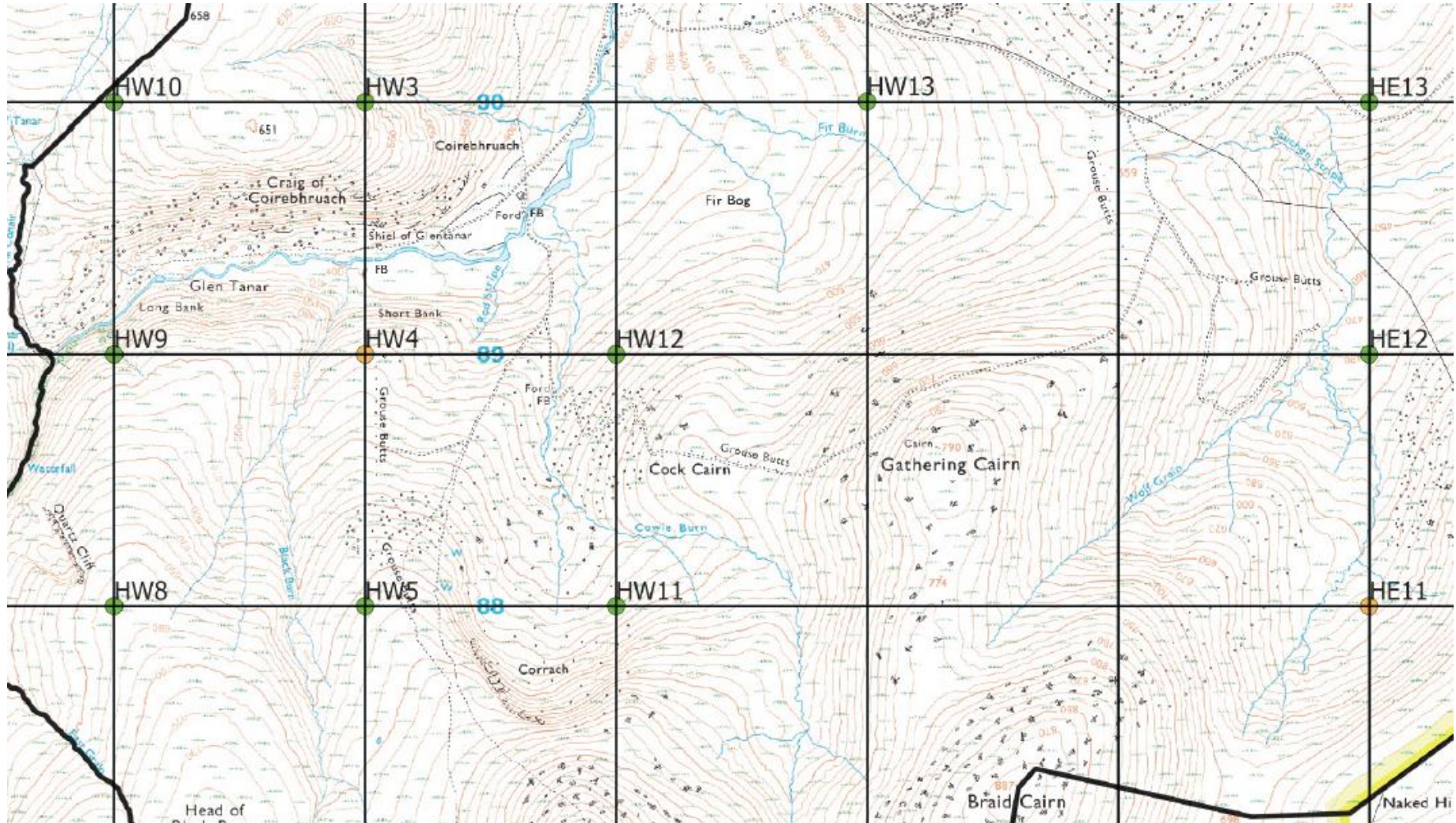


- Number of plots with less than 33% heather shoots browsed
- Number of plots containing 33-66% browsed
- Number of plots containing above 66% browsed



- Hoof marks present
- Hoof marks not present

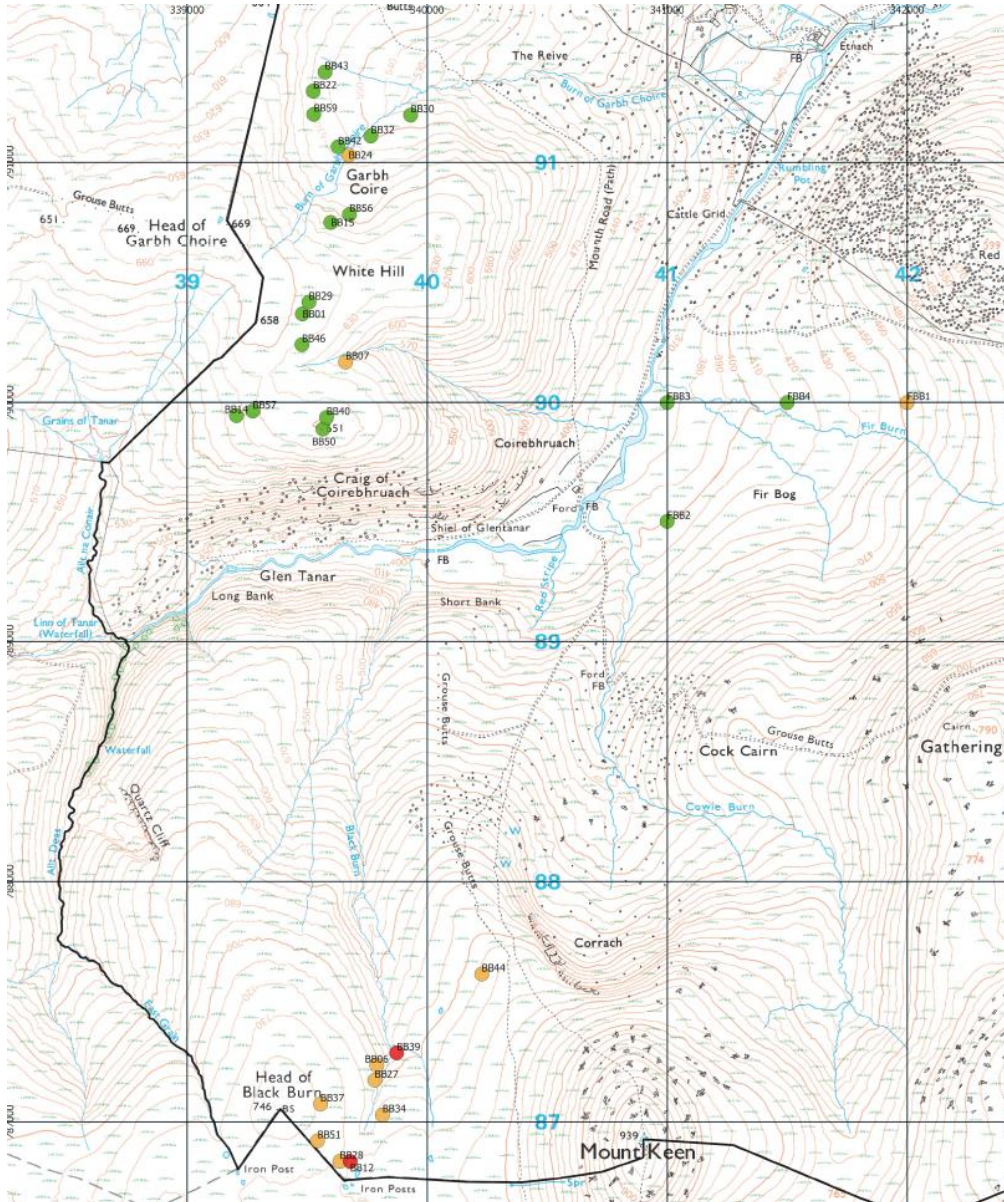
Analysis of results



Analysis of results



FARM
ADVISORY
SERVICE

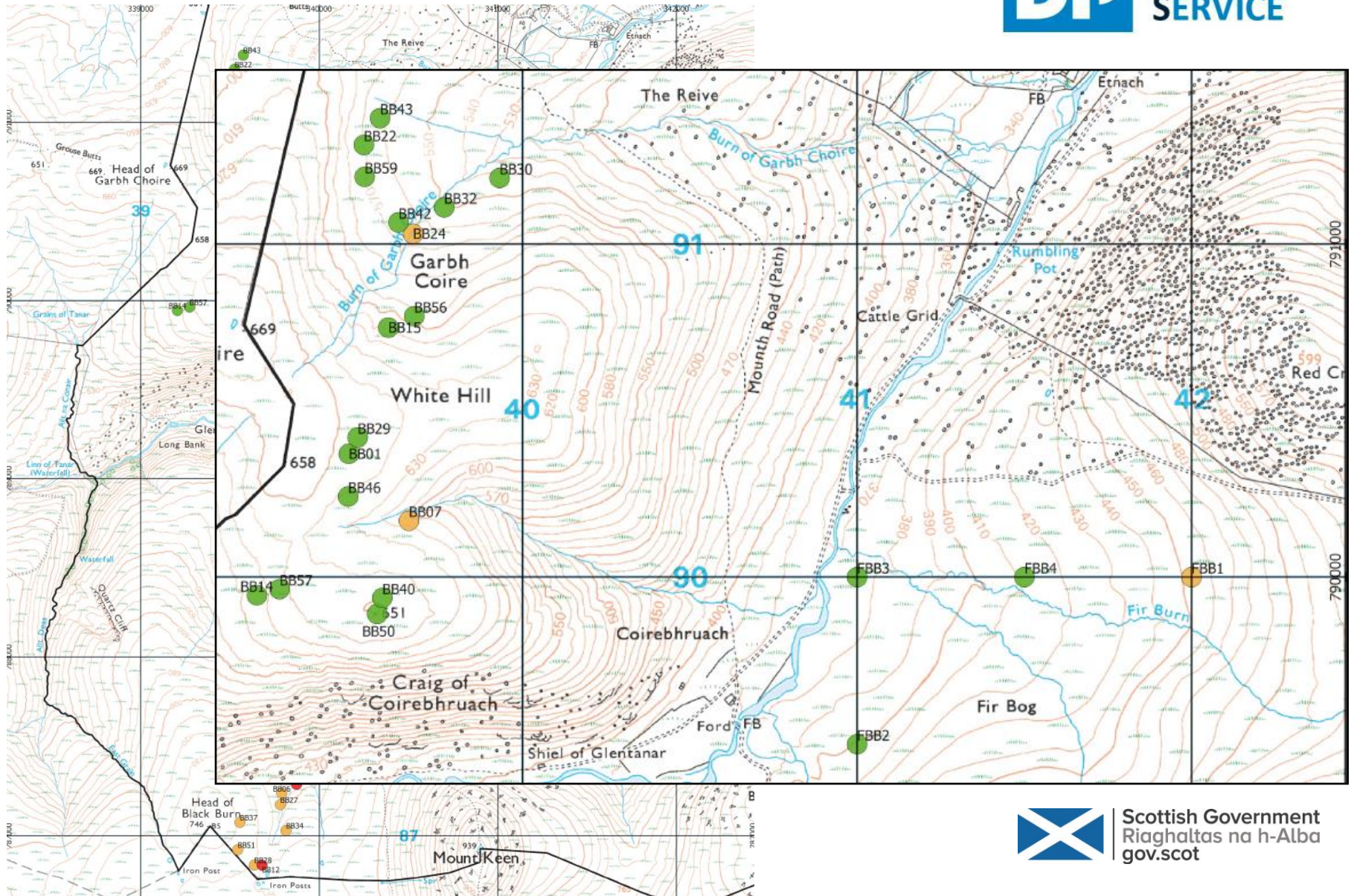


Scottish Government
Riaghaltas na h-Alba
gov.scot

Analysis of results



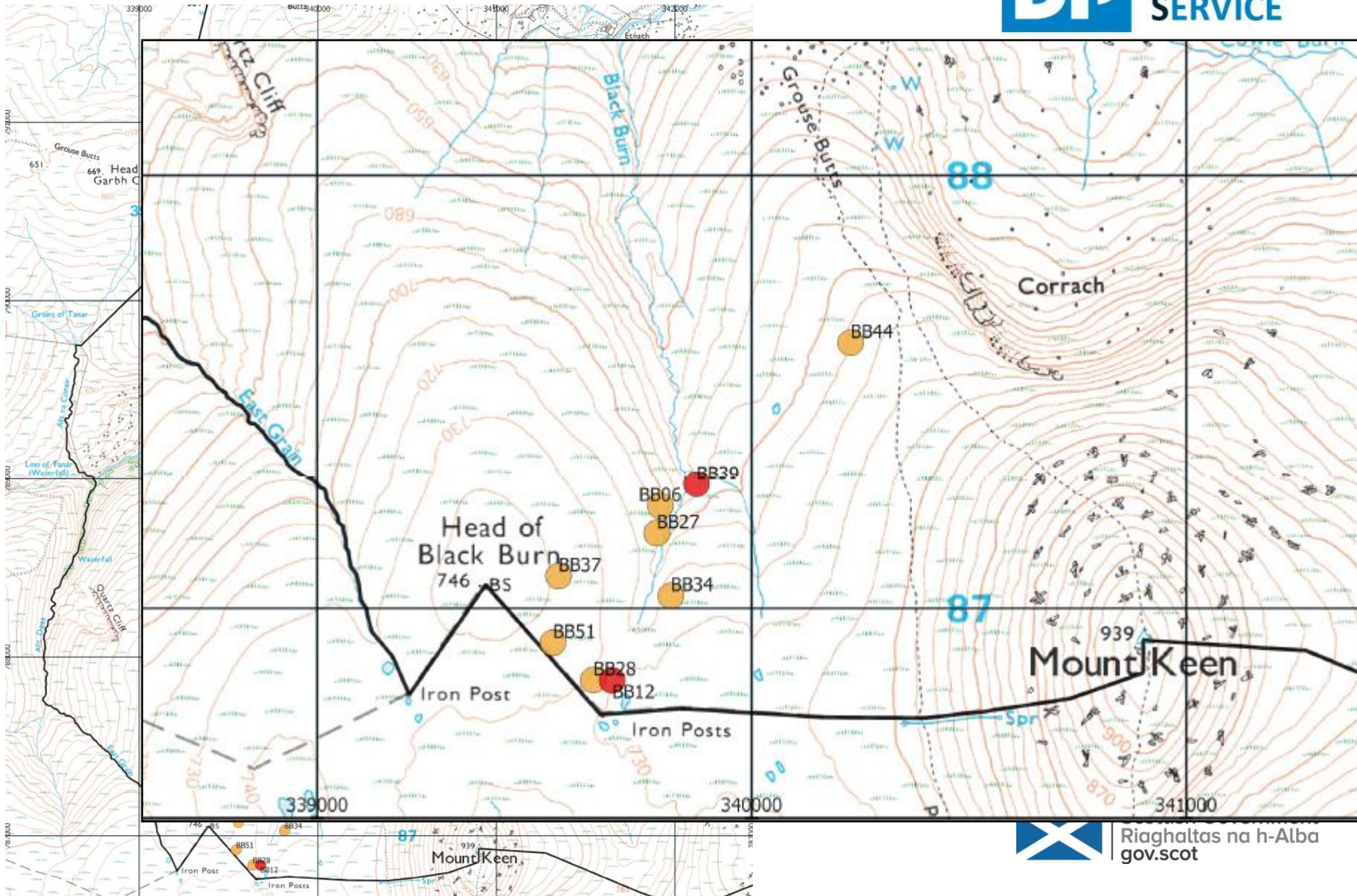
FARM
ADVISORY
SERVICE



Analysis of results



FARM
ADVISORY
SERVICE



Riaghaltas na h-Alba
gov.scot