TAiM

By Annabel Everard

Grassland surveys by Highlands Rewilding

Our surveys of grassland composition and condition

Figure 1. Grasslands at Beldorney Estate, Aberdeenshire.

Introduction

Grasslands can be rich in flora, fauna and carbon stored in their soils and roots. Understanding the distribution, composition and condition of grassland habitats is vital for their quantification and effective monitoring of management and restoration.

Ground truthing grasslands

Detailed grassland composition and condition data was generated for 31 field sites to compare with remote sensing data generated for the same area.

Surveying grassland composition

The 31 field sites spanned neutral, acid and calcareous grassland types selected from available NVC data and field boundaries. ‘W-walk’ transects (so-called because they involve walking through the survey area in a ‘W’ shape to capture variation) were used to record field characteristics and species compositions. 1 m^2 quadrats were also broadly evenly distributed along each transect (e.g. Figure 2), and used to capture more detailed species composition data. The number of quadrats surveyed was weighted by field area (Table 1) and the survey design was pre-loaded onto a GIS device to guide surveyors in the field. Surveyors recorded grassland type and the percentage cover of physically damaged ground and bracken cover during walk-overs of the W-transects. At each quadrat they recorded all flora present on the DAFOR scale (Table 2), sward height, and the percentage

Figure 2. Grassland survey in progress.

cover of bare ground, and all herbs and bryophytes. Quadrats were also GPS-located and photographed.

Table 1: Number of quadrats per field area

Area (ha)	Number of quadrats
1—3	5
4—7	10
8—11	15
12—15	20

Table 2: DAFOR scale summary

Scale	In-full	Cover (%)
D	Dominant	81—100
A	Abundant	61—80
F	Frequent	41—60
O	Occasional	21—40
R	Rare	1—20

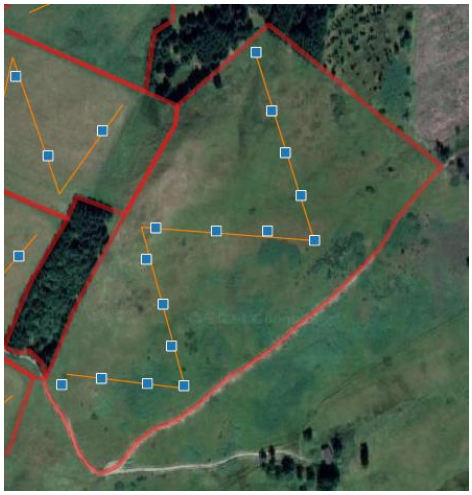

Figure 3. Example survey site with quadrats roughly evenly distributed along a W-walk transect.

Assessing grassland condition

The data were used to classify field sites as being in Good, Moderate or Poor condition based on the criteria testing approach of Defra's statutory biodiversity metric assessment. These assessments consider herb abundance, sward structure, cover of bare ground and indicators of disturbance, including physical damage, invasive species and Bracken (e.g. Figure 4 [left]) – see Table 3 for full details. To achieve Good or Moderate condition, fields must pass a species diversity criterion (Criterion A). Good condition required an additional four of the remaining five criteria. Moderate condition requires the first and three others. Poor condition is assigned where fields fail to pass criterion A but pass more than three other criteria, or where they pass less than three criteria but not criterion A.

Grassland condition the presence of indicator species. Averis (2020) defines grassland-type specific indicator species values and using our quadrat-level species data, we could identify the number of negative and positive indicator species in each field.

Figure 4. Condition assessments considered encroachment of Bracken which can have negative implications where cover is > 20 % (left) and negative indicator species such as Spear Thistle (right).

Table 3: Criteria for assessments of grassland condition.

Criteria	Focus	Bold
A	Species diversity	Presence of at least two vascular plant species per 1 $m^{2,}$ including a minimum 2 forbs. Essential for Good or Moderate condition.
B	Sward heterogeneity	A minimum 20 % of sward < 7 cm and 20 % of sward > 7 cm
C	Physical damage	< 5 % of grassland physically damaged e.g. by access tracks or excessive poaching
D	Bare ground	< 10 % cover of bare ground
E	Bracken	< 20 % of grassland covered by Bracken
F	Invasive species	Absence of Rhododendron (*R. ponticum*), Himalayan Balsam, Japanese Knotweed, Giant hogweed, American Skunk Cabbage or Giant Rhubarb.

Review of survey approach

Our surveys identified 32 % of sites to be in Good condition, whilst the rest were of Moderate condition. Vitally, they identified the potential to improve grassland condition by reducing Bracken cover, encouraging greater sward height variability and only small areas of bare ground (no more than 10 % of the field). Of potential consideration in future assessments of grassland conditions, surveyors should note the form of damaged ground, as these can have management implications. For example, damaged ground due to recent short-term cattle presence can have long term benefits of disturbing bracken and encouraging sward height diversity, whilst mechanical access damage requires alternative mitigation. Overall, not only have these surveys provided vital data for ground truthing remote sensing data, but are of use to guiding future restoration management of these habitats.