

Aim

The aim of this guide is to describe the Best Practice Guidance for Habitat Impact Assessment (BPG HIA) method for dwarf shrub heath. The BPG HIA guides, Principles* and Principles in Practice** are essential pre-reading.

Habitat description

Dwarf shrub heath has abundant dwarf-shrubs accompanied by other non-woody species, mosses and lichens. The exact mix depends on the soil type and amount of rainfall in the area, as well as the history of burning and browsing. There are two broad types.

Dry heaths are usually found on drier, moderately to steeply sloping ground and are dominated by ling heather (Calluna vulgaris) or blaeberry (Vaccinium myrtillus) or bell heather (Erica cinerea), with little or no deer grass (Trichophorum spp) or purple moorgrass (Molinia caerulea).

Wet heaths are usually on wetter, gently-sloping ground and typically contain species such as deer grass, purple moor-grass, cross-leaved heath (Erica tetralix) and sometimes bog myrtle (Myrica gale). Wet heath vegetation can resemble that of blanket bog, but has little or no hare's tail cotton grass (Eriophorum vaginatum) or bog moss (Sphagnum species). Wet heath vegetation on peat more than 50 cm deep is classed as blanket bog. Alpine heath, in which dwarf shrubs form a low, wind-clipped mat, is found at higher altitudes and is not included here.

Key indicators

Deer impacts on dwarf shrub heath is mainly by trampling and browsing¹. **Browsing** is measured by looking at the percentage of heather 'long shoots' browsed. This indicates the 'off-take' from the heather. If heather is not present, browsing on blaeberry can be used instead. Any browsing on cross-leaved heath may indicate a high impact since it is unpalatable. If Medium or High impacts (greater than 33% shoots browsed) are recorded on heather

Bell heather (Erica cinerea) Shrub. Height to 60cm. Leaves 5-7mm

Cross-leaved heath (Erica tetralix) Dwarf shrub. Height to 60cm. Leaves 2-4mm

Ling heather (Calluna vulgaris) Evergreen shrub. Height to 60cm (rarely to Im). Leaves 1-2mm

Purple moor-grass (Molinia caerulea) Wiry perennial often forming tussocks. Height 15-150cm. Long narrow purple spikelets 4-9mm

Blaeberry (Vaccinium myrtillus) Deciduous shrub. Densely tufted Height up to 60cm. Leaves I-3cm

Deer grass (Trichophorum cespitosum) perennial. Height 5-35cm. Spikelet 3-6mm year after year they are likely to lead to decline and loss of heather. Heather in the early stage of growth can tolerate higher off-take.² Trampling is simply recorded as an additional comment during surveys. Note that bog myrtle is not a dwarf-shrub.

Fieldwork

Principles and Planning

For information on the number and location of plots as well as what time of year to assess, follow the detailed guidance in BPG Principles* and BPG Principles in Practice**.

Setting up the plot

Locate each plot using a GPS. On the first visit, if the GPS point falls into the wrong habitat type or an untypical area (e.g. ATV route or feeding site), relocate it to the nearest patch of the correct habitat, within 50m, and record the new location using GPS. Mark the plot with a post or tag. This should be small enough to minimise attention by deer; hammered below vegetation height, or located at a fixed distance (e.g. 10m) from the plot. When establishing plots:

- Be aware of ground nesting birds. Avoid placing plots where birds are showing alarm behaviour. Avoid any disturbance of ground nesting birds during wet or windy conditions.
- Minimise trampling. Try not to add to the impact!

long-shoot without flowers. most long-shoot with shoot extension flowers. flowers occurs in June-July on modified short-shoots are deciduous end of season leaves are smaller and more closely packed stem leaves 2 8 begin to shed 7 short-shoots (side 6 5 12 after 1 to 2 shoots) are active 11 10 9 vears for 2 to 3 years, 16 15 14 then shed 13 POST

DestPractice guidance

Use lightweight material (e.g. proprietary quadrats or rope and tent pegs) to mark a $2m \times 2m$ plot which is subdivided into sixteen $0.5m \times 0.5m$ quadrats. The right-hand edge of plot should be orientated due North (or the bearing recorded).

What to measure in the field

3 Once the plot is established, use the BPG recording sheet / workbook*** for dwarf shrub heath to record the indicators set out in the table below.

What to measure	How to record	
Height of dwarf shrubs (Note that bog myrtle is not a dwarf-shrub)	In Quadrat I, take 5 measurements of dwarf shrub height above the ground by running a hand down a ruler placed vertically in the centre and in each quarter of the quadrat to the first 'hit' on a dwarf shrub. Record the average of your 5 measurements. If there are only a few shoots in the quadrat, measure them all and take an average. Repeat for quadrats 4, 10, 13 and 16.	
Browsing of heather shoots (If ling heather absent, use blaeberry. If neither present, use the next indicator)	 In Quadrat 1, estimate the proportion of last year's long shoots which have been browsed. Closely examine 5 "handfuls" of shoots (circles of approximately 5cm diameter), estimating the percentage of shoots browsed in each, and taking the average. Record as: L - less than 33% of long shoots in the sample browsed; M - 33 - 66% long shoots browsed; H - more than 66% long shoots browsed. Repeat for quadrats 4, 10, 13 and 16. 	
Browsing on cross-leaved heath (ONLY if heather and blaeberry absent.)	 In the absence of heather or blaeberry, record if any browsing of cross-leaved heath occurs in the plot. If cross-leaved heath is not browsed, or not present, leave blank. 	
Dwarf shrub cover	For all quadrats record if dwarf-shrubs (of any species) are present. Note that bog myrtle is not a dwarf shrub.	

Additional information to record

What?	Why?	How to record
Heather stem breaks	Heather broken by trampling indicates high impact.	Record presence of heather stem and branch breakage caused by trampling – old heather may be dried/brittle.
Other herbivores	Deer, sheep, cattle, goats, hares and grouse graze and trample in different ways. It is important to know which herbivores are present.	Record signs (sightings, dung, hoof prints, hair, wool, etc.) record in the Additional Information boxes.
Burning ²	Burning can alter species composition and grazing patterns. It may affect how herbivores use the area, or directly affect the habitat	Record evidence of old (5 or more years) or recent (less than 5 years) burning, in the plot and the surrounding area, in the Additional Information or Other Comments boxes.
Other information	Additional information may help in interpretation, e.g. if a plot is next to a feeding site, higher impacts may be seen.	Use the Other Comments box to highlight information that may help interpret the results and inform future management.
Take at least two digital photos of the plot from replicable vantage boints	Photographs provide a useful way to visually monitor changes to the habitat over time, and assist in plot relocation for future assessments. A good photographic record can also help to confirm the results of the survey.	Photos should be taken with the quadrat frame in place. Use laminated numbers to identify the plot in the photographs. Take one photo from south of the plot and include the whole plot. A second photo should show the plot in wider context, for example with an identifiable landmark. If possible, take the second photo from a standard position (10m south of the plot) or use other landmarks, if better, noting direction. Where no obvious landmarks take further photos, North, East, and West. Record the photo numbers.

Becord and note any of the factors in the table below that apply.

Data analysis

Summarise and analyse the data collected, following the detailed guidance in BPG: Analysis (Dwarf Shrub Heath) \pm .

Understanding Impacts; Interpreting results and management actions

DestPractice guidance

Interpret results and consider possible management actions following the detailed guidance in BPG: Understanding and presenting results^{*****} and Interpretation and management actions (Dwarf Shrub heath) $\pm\pm$.

*BPG Habitat Impact Assessment: Principles **BPG Habitat Impact Assessment: Principles in Practice ***BPG Habitat Impact Recording Sheet / Workbook

(Dwarf Shrub Heath) **** BPG Habitat Impact Assessment: Analysis

(Dwarf-Shrub Heath).

 \pm BPG Understanding and presenting results $\pm\pm$ BPG Habitat Impact Assessment: Interpretation and management

¹ Guide to Upland Habitats, Surveying Land Management Impacts. Angus Macdonald, Penny Stevens, Helen Armstrong, Philip Immirzi and P Reynolds. Scottish Natural Heritage https://www.nature.scot/guide-upland-habitats-surveying-landmanagement-impacts-volumes-1-and-2
2 Heather damage: a guide to types of damage and their causes. 2nd ed. A MacDonald http://jncc.defra.gov.uk/page-2636
3 Muirburn Code https://www.nature.scot/doc/guidance-muirburncode