



FLUSHES & SPRINGS

Aim

To describe methods of assessing Flushes and Springs habitat relevant to deer managers.*

Habitat description

Flushes and springs are where ground water seeps or springs from a hillside. Some are acid and some are 'base rich' (that is, rich in minerals such as lime). Flushes and springs support a number of rare small plants: sedges, rushes, herbs, liverworts and mosses (see species list overleaf). Where the water

(below left) signs of high impact: hoof print in bare soil. (below right) signs of low impact: spring showing few signs of trampling



is very lime rich deposits of tufa (porous rock) may form with associated mosses. Springs are usually large enough for a square (2m x2m) plot. Flushes are generally narrower, requiring a 1m x 4m plot.

trampling.¹ Direct deer trampling is assessed by the presence of bare soil with deer hoof prints visible.

Key indicators

The main impact that deer have on flushes is

Other impacts

Flooding may cause flushes to be washed out. Other herbivores such as sheep may also cause trampling impacts.

Scorched alpine-sedge

A creeping perennial. Height 5-35cm. Leaves 1cm 2-5mm wide



Mossy saxifrage

Perennial herb. Height 5-20cm. Leaves up to 1cm



Scottish asphodel

Height to 20cm. Basal leaves 1.5-4cm x 1-2cm, stem leaves smaller



Yellow saxifrage

Perennial herb. Height 5-20cm. Leaves 1-2cm



Starry saxifrage

Perennial herb with short stock. Leaves 0.5-3cm



an overview photo of the spring and surrounding features will help to relocate the location for repeat monitoring. For information on the number and size of plots and what time of year to measure, see BPG Habitat Impact Assessment: Principles in Practice

What to measure	How to analyse
For trampling, record bare soil (for flushes) or mosses (for springs) with a deer hoof print in each of the 16 quadrats.	For each plot, summarise the frequency** of quadrats with presence or absence of deer hoof prints (for example: 5/16 quadrats, hoof prints PRESENT; 11/16 quadrats, hoof prints ABSENT). For each site, summarise the frequency of quadrats with deer hoof prints present or absent (for example, in a site with 10 plots (a total of 10 x 16 quadrats): 60/160 quadrats, hoof prints PRESENT; 100/160 quadrats, hoof prints ABSENT).
Record presence of pulled-up mosses and other plants in each of the 16 quadrats.	For each plot, summarise the frequency of quadrats with presence or absence of pulled-up mosses/plants (for example: 7/16 quadrats, pulled-up mosses/plants PRESENT; 9/16 quadrats, pulled-up mosses/plants ABSENT). For each site, summarise the frequency of quadrats with pulled-up mosses/plants present or absent (for example, in a site with 10 plots (a total of 10 x 16 quadrats): 60/160 quadrats, pulled-up mosses/plants PRESENT; 100/160 quadrats, pulled-up mosses/plants ABSENT).
Take digital photo of whole plot from fixed point (see illustration below).	Will enable detection of changes in vegetation distribution over time.

a fixed point photo of a 1m x 4m flush plot running down a flush



Flushes & Springs species:

- Bristle sedge/ *Carex microglochin*
- Sheathed sedge/ *Carex vaginata*,
- Mountain scurvygrass/ *Cochlearia micacea*
- Two-flowered rush/ *J. biglumis*
- Chestnut rush/ *J. castaneus*
- Three-flowered rush/ *J. triglumis*
- False sedge/ *Kobresia simpliciuscula*
- Iceland purslane/ *Koenigia islandica*
- Scorched alpine-sedge/ *Carex atrofusca*
- Alpine rush/ *Juncus alpinoarticulatus*
- Scottish asphodel/ *Tofieldia pusilla*
- Cratoneuron/ *Cratoneuron* spp
- Purple saxifrage/ *Saxifraga oppositifolia*
- Mossy saxifrage/ *S. hypnoides*
- Yellow saxifrage/ *S. aizoides*
- Alpine saxifrage/ *S. nivalis*
- Starry saxifrage/ *S. stellaris*

* The BPG guides *Habitat Impact Assessment: Principles and Habitat Impact Assessment: Principles in Practice* should be regarded as essential introductions to this subject ** See BPG *Habitat Impact Assessment: Analysis*

¹ *Guide to Upland Habitats, Surveying Land Management Impacts*. Angus Macdonald, Penny Stevens, Helen Armstrong, Philip Immirzi and P Reynolds. 384 pages, 2 volume set, 50 col photos. Scottish Natural Heritage. See BP Contacts