

Summary of the current status of the montane and submontane plants of the Moffat Hills in Dumfriesshire

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Abstract

In 1958 Derek Ratcliffe described the relict montane and submontane flora in the Moffat Hills. He gave a fuller account of 63 of the species in an unpublished listing in 1990. Recent survey work has attempted to refind all of these species and determine their full distribution in these hills.

Keywords: relict montane flora; Derek Ratcliffe; species rediscovery; rare plants; plant conservation; Scotland

Introduction

Since the nineteenth century the Moffat Hills have been known to have a relict montane flora that is uniquely rich in the Southern Uplands of Scotland. It is an outlier of plant communities that occur more plentifully and with much more diversity in the Highlands north of the Central belt in Scotland. Such montane communities are also represented further south in the Pennines, Lake District, and North Wales though the species components differ in detail. Indeed there are some surprising gaps in the Southern Uplands flora of plants which are present in the Highlands and then the Lakes and Pennines. For example there is no *Alchemilla alpina* (Alpine Lady's-mantle) or *Saxifraga aizoides* (Yellow Saxifrage) apart from one small population of the latter on the Ayrshire coast. In the south of Scotland some of the montane and submontane community found in the Moffat Hills also occurs in the adjacent hills of Peeblesshire and Selkirkshire and in the more western Merrick Kells range in Kirkcudbrightshire. However, none of these other south Scotland hills has a plant community of quite the same diversity as found in the Dumfriesshire Hills.

Derek Ratcliffe (DAR) was one of the most outstanding field naturalists and conservationists of his time. He is well known for work showing the effect of pesticides in birds of prey. He published many influential books and papers such as Monograph No. 1 of the Nature Conservancy (Ratcliffe, 1977) and co-authoring *Plant Communities of the Scottish Highlands* (McVean & Ratcliffe, 1962). Of relevance here is the fact that he was born in Carlisle and from there undertook botanical explorations in the Dumfriesshire hills in the early 1950s when he based himself in Moffat Dale and set out to refind the montane and submontane plants that the Victorian botanists had found here. DAR talks about this in his New Naturalist book *Galloway and The Borders* (Ratcliffe, 2007). The finds of local Moffat botanist J.T. Johnson in particular were recorded in Scott-Elliott's *Flora of Dumfriesshire* (Scott-

Elliot, 1896). Over a number of visits DAR refound most of these and added a couple of additional species and he wrote about the area in a paper, *The Mountain Plants of the Moffat Hills* (Ratcliffe, 1959). In this paper he set out the particular climate and geology that has given rise to the refugia that support these species. This is notably the existence of rocky crags, in places the presence of lime bearing rock and calcareous flushes, the altitude with some hills rising to over 800 m, and the cold climate with hard frosts and snow lying late in the Spring.

Methodology

The area discussed here (Fig. 1) includes the hills either side of the deep glacial valley of Moffat Dale in the north east corner of Dumfriesshire. It extends to the A701 in the west as well as the lower ground of the valley bottoms extending to the junction of the Annan and Moffat Waters south of Moffat; it also includes the town of Moffat itself. The hills north of Moffat Dale rise to 821 m on White Coombe with three other summits above 800 m. On the south side of Moffat Dale the hills are not as high rising to 688 m on Loch Fell and 678 m on Capel Fell. The county boundary follows the watershed so the waters from all this ground drains either into the Moffat Water or the Annan Water and south to the Solway.

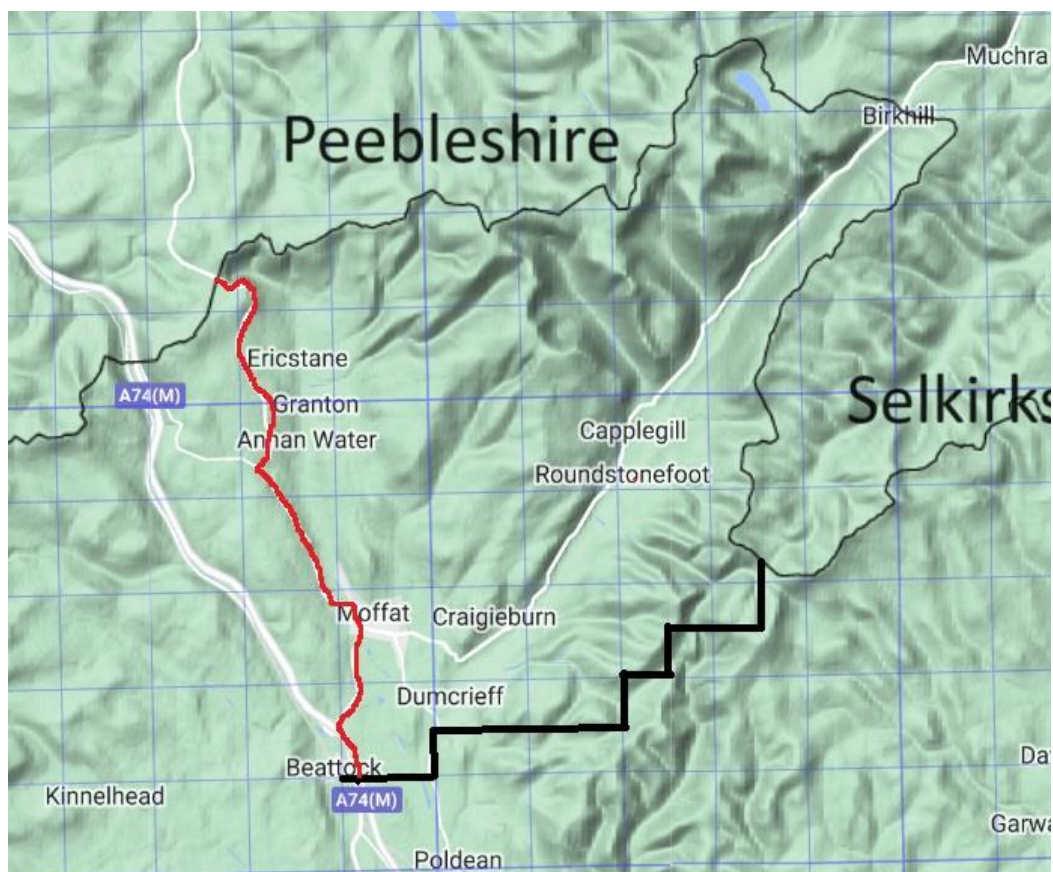


Figure 1. The area encompassing the montane and submontane flora in the Moffat Hills in Dumfriesshire. The county boundary with Selkirkshire and Peebleshire runs along the watershed. The A701 (red) defines the limit of high ground in the west and the black line the Moffat Water catchment to the south. Note the grid on the map is of tetrads (2 km x 2 km squares).

In 1990 DAR drew up an unpublished listing of the status of 63 montane and submontane species based on his visits and more recent information that had reached him. This listing was for the benefit of staff in the conservation agency responsible for the management of the Moffat Hills SSSI and had the instruction that it was to be treated in strict confidence. His main focus was on the hill block north of Moffat Water though he mentions occurrences at Selcoth and Craigmichan Scar in the hills on the south side of Moffat Dale. In his listing DAR gives brief information about the first recorder and the date of discovery if known, says something about habitat, altitude, the frequency of each species, and locations where they were known. His locations are sometimes broad areas like Black's Hope which encompass several monads (1 km x 1 km squares) and many possible individual locations while at other times he lists individual Craigs with six figure (100 m) grid references.

In the period since DAR published his listing more systematic recording in the Dumfriesshire Hills has been undertaken, particularly since 2000. Several recorders have visited and contributed to the more detailed occurrence records that now exist. In the last ten years the author has attempted to co-ordinate recording of all species in all of the 191 monads or part monads that lie in the area defined on the map. This has given a more comprehensive record of the occurrence of populations of many of these species than has previously been available. It is an appropriate time therefore to compare the current known distribution of this special flora with the listing by DAR to give an up to date understanding of the status of this plant assemblage between 1990 and the end of 2024.

It is worth briefly reflecting on how current land use differs since DAR drew up his list. Given that a significant part of the Moffat Hills in Dumfriesshire are designated as a Site of Special Scientific Interest (SSSI) (covering 29 monads or 2892 ha) they are in principle protected from major land use change. The main land use in these hills historically has been sheep and cattle grazing supplemented by a population of wild goats and this would have been the case in the time DAR was visiting and recording. For the most part this has produced an open habitat of acid and calcareous grassland, wet and dry heath and blanket bog and continues except for areas where there has been a change to woodland or forestry management.

Outside the SSSI about 24 monads are dominated by mature conifer plantations. Since the 1990s the hills have largely escaped further encroachment from commercial conifer plantations which continues in many other parts of the Southern Uplands. Borders Forest Trust have purchased two large areas at Carrifran, within the SSSI, and at Corehead and the Beeftub outside the SSSI, amounting to 1365 ha where they have undertaken the removal of grazing stock and planted significant areas of native woodland. Recent private planting of native or mixed woodland has also occurred on parts of hills on the south side of Moffat Dale for example at Selcoth. Some of these have been carefully designed to avoid species rich areas and summit areas and native woodland probably now cover about 10 monads in total of ground that was formerly open habitat in DAR's time. The Grey Mare's Tail was already owned and managed by The National Trust for Scotland in DAR's time. They have focused on helping the rare flora, however they do not have control of the grazing.

There are at least two results from these changes. The first is that where grazing is removed there is more vigorous growth of vegetation. The native trees planted in Carrifran are now over 20 years old and forming a closed canopy at lower

levels. Where trees are less vigorous or outside the planted areas some species have become more obvious as a consequence. For example, *Trollius europaeus* (Globeflower) has been able to flower in grasslands where previously it was too closely grazed to do so and so has been recorded in more places. The same applies to species like *Alopecurus magellanicus* (Alpine Foxtail) which grows in flushes. These areas are closely grazed when graziers are present and the *A. magellanicus* often difficult to find. However, where grazing animals have been removed growth is now much more vigorous and species such as the *A. magellanicus* are now more obvious. The second consequence is that some of the montane and submontane flora is now present in more locations because they have been planted. Species like *Salix lapponum* (Downy Willow) and some other willows have been planted in the upper levels of both Corehead and Carrifran and within an enclosure at Grey Mare's Tail. A further innovation is that conservation work has focussed on species such as *Woodsia ilvensis* (Oblong Woodsia) which has been led by the Royal Botanic Garden Edinburgh. Plants from spores collected in the Moffat Hills have been cultivated and sporophytes planted to try to help sustain this species.

The following listing of species follows the same format to that in DAR's 1990 list. I have kept his species apart from *Poa balfourii* which DAR himself thought should now be regarded as *Poa nemoralis*. I have added species found more recently and one or two critical taxa that he mentioned but did not list but which are genuine members of a montane or submontane flora. Like him, I have excluded the Hieracia. I have where possible given the original date of discovery or rediscovery, but I have not listed grid references. All records are available in the BSBI Distribution Database, with some rarer species also listed in the Dumfriesshire Rare Plant Register.

I have attempted to translate DAR's occurrence information on the number of sites known to him and compare with the number of monads where they have been recorded since 1990. This gives an approximate measure of the continued health or decline of these species but it does not work perfectly for five reasons:

- DAR did not claim to give the exact number of locations that plants occur unless their distribution was quite restricted. For more widespread species he simply notes that they were widespread or abundant.
- DAR was mostly focused on the highest hills. The area studied in more detail here covers this high ground but also goes further out onto lower ground. This means that there are more records of the most widespread species but also a few additional records of the less common species.
- DAR did not systematically visit every part of these hills. Where plants appear much more widespread today this is more a result of the systematic survey effort in recent years than any extension in distribution. DAR may not have visited much of the ground on the south side of Moffat Dale. He references some locations there but some recent finds of some of the montane flora there may simply be because he did not visit those slopes.
- Where DAR lists locations these are named locations in the hills which do not necessarily fall into individual monads. Some of his sites are whole valleys such as Black's Hope. This could mean several monad occurrences so the comparison is not perfect. In my narrative I have noted whether the species has been refound in his sites or not.
- Recent occurrence is noted as presence in a monad. No attempt is made to enumerate the number of populations within each monad or with one or two

exceptions the size of individual populations. For most monads this will mean at least one occurrence is recorded but for some species there will be more records in some monads. For example, *Neottia cordata* (Lesser Twayblade) occurs under heather in the blanket bog of the Grey Mare's Tail and may be found frequently in a single monad.

Results

It is evident perhaps that this is a relict floral assemblage and, as DAR noted in his 1959 paper, the species for the most part are rare and insignificant in their contribution to the bulk of the vegetation. The interest lies in the ecological and phytogeographical story their presence relates. A * against the species indicates that, outside the Moffat Hills, it is not found elsewhere in Dumfriesshire. A ** indicates that the species is not found anywhere else in the South of Scotland.

Ajuga pyramidalis (Pyramidal Bugle) ** **DAR sites 1. Current Monads 1.**

This was originally found by J.T. Johnstone in 1888 and in 1890 in the Black's Hope. This was not re-recorded until 1976 and 1977 by J. Mitchell and J.B. Mason. It has been seen since by J. Waddell in 2007 and again in 2024 when 23 flowering spikes and 12 non-flowering plants were seen at 600 m. This species is currently only known from this single site in Southern Scotland and is 102 km from the nearest known population in Cumbria.

Alchemilla glomerulans (Clustered Lady's-mantle) * **DAR sites N/A. Current Monads 1.**

Not known from these hills until 2013 when seen by F.J. Roberts at 576 m on the White Coombe Cliffs and in the same place in 2014. Known from only one location currently but likely to be present elsewhere in these hills.

Alchemilla wichurae (Rock Lady's-mantle) * **DAR sites 4. Current Monads 5.**

Originally found by E.F. Linton in the Midlaw Linn in 1884. DAR reported it in 4 locations. It has been recorded in 5 monads since 2000 one of which is new to those known to DAR. This critical species is still likely to be under recorded.

Alopecurus magellanicus (Alpine Foxtail) * **DAR sites 2. Current Monads 8.**

The first find outside the Highlands was in the Moffat Hills by DAR in 1956. It was in a flush on White Coombe and subsequently found in an additional flush in the same monad. Since 1990 systematic recording has shown it to occur in many flushes across the hills in a total of eight monads. When grazed the flower spikes tend to be removed making it difficult to detect, but in places such as Carrifran where grazing has been removed it has become more conspicuous.

Antennaria dioica (Mountain Everlasting) **DAR sites 7. Current Monads 2.**

On dry rocks. DAR reports this to be scattered and never abundant. He gives seven locations without grid references but these probably represent 5 or 6 different monad occurrences. In recent years it has only been found in one monad in the Moffat Hills in the Black's Hope (one of DAR's sites) on Redgill Craig. The other site is on the south side of Moffat Dale at Bells Craig.

Arctostaphylos uva-ursi (Bearberry) * **DAR sites 1. Current Monads 1.**

This species has been known from the Moffat Hills since 1843. While two locations were mentioned in the 1896 Flora it has only been known from one site since 1960 which is a DAR record. It remains on this one craig where several patches were seen in 2015.

Arabis hirsuta (Hairy Rock-cress) **DAR sites 4. Current Monads 9.**

This has a scattered occurrence on dry rocks from the Beeftub to the Grey Mare's Tail. Still in DAR's locations and a few additional sites with one lower-level record near Moffat. There is one record from the hills on the south side of Moffat Dale at Bill Cleuch.

Asplenium viride (Green Spleenwort) **DAR sites 4. Current Monads 10.**

Occurs in shady crevices of calcareous rocks. It is infrequent but scattered. It still occurs where DAR listed it with Black's Hope the stronghold with 5 monad records. In Selcoth Valley it has been seen in two locations but not refound in DAR's original site.

Botrychium lunaria (Moonwort) **DAR sites 5. Current Monads 7.**

An inconspicuous plant that is scattered but never in quantity. In short vegetation and on ledges on basic soils. Still at three of DAR's sites. In addition, at Corehead and Hartfell and in two monads in the Selcoth valley.

Carex atrata (Black Alpine-sedge) ** **DAR sites 2. Current Monads 2.**

These exceedingly small, isolated populations have been known since first recorded in 1848. They persist on rock ledges at DAR's sites at Hartfell and Midlaw.

Carex bigelowii (Stiff Sedge) **DAR abundant at higher levels. Current Monads 45.**

DAR said this is the most abundant true mountain plant of the Moffat Hills. It is now known that it occurs generally above 600 m in grassland, heath and blanket bog across all of the hill tops. It extends from Whitehope Heights in Corehead to Watch

Knowe on the Peebleshire boundary and along the top of the south side of Moffat Dale from Gateshaw Rig to Trowgrain Middle on the Selkirkshire border.

Carex capillaris (Hair Sedge) ** **DAR sites 1. Current Monads 1.**

Even more restricted than *C. atrata* though possibly with more individuals. It continues to be present on one ledge in the Midlaw Linn where it was first noted in the 1896 flora and seen by DAR.

Carex vaginata (Sheathed Sedge) * **DAR sites 2. Current Monads 7.**

In flushed grassland at high levels. It is a tricky species to find but is now known to be more widespread across the Moffat Hills from the western side of Hartfell to flushes above the Midlaw Linn including at least one of DARs sites. It has also recently been confirmed from the slopes of Whiteshank on the south side of Moffat Dale (where it also occurs on the Selkirkshire side of the hill).

Cerastium alpinum (Alpine Mouse-ear) * **DAR sites 1. Current Monads 1.**

There is an herbarium specimen from 1888 from Black's Hope almost certainly from the Hartfell Craigs where it was also seen by DAR. It remains present on these craigs but has not been seen anywhere else.

Cochleria pyrenaica (Pyrenean Scurvygrass) **DAR sites 8. Current Monads 54.**

This is locally abundant in flushes and water courses. It has gone through various taxonomic treatments over the years (DAR called it *C. alpina*). It is now regarded as the widespread upland taxon in the Southern Uplands. The present distribution includes all of the areas mentioned by DAR. It is now also known to be just as extensive on the south side of Moffat Dale.

Cornus suecica (Dwarf Cornel) * **DAR sites 2. Current Monads 6.**

First found by Miss L. Hume in 1931 on Whitecoombe and seen by DAR in 1951. At high elevations where snow accumulates and persists such as cornice lines (along the east edge of Mid Craig) or in hollows. It persists in DAR's sites and further patches have been found in recent years on the highest hills. It does not occur on the south side of Moffat Dale.

Cryptogramma crispa (Parsely Fern) **DAR abundant on acid screes. Current Monads 67.**

As DAR stated this is a widespread and conspicuous fern on both sides of Moffat Dale wherever there are craigs or screes. It can be found low down in suitable habitat. It extends from the Beeftub to the Peebleshire border in the Moffat Hills and

from the Selkirkshire border to Craig Fell SE of Moffat on the south side of Moffat Dale.

Cystopteris fragilis (Brittle Bladder-fern) **DAR widespread. Current Monads 17.**

This is found particularly on the more calcareous rocks of the Moffat Hills. It can be found low down such as at Dobs Linn or at high levels as on Hartfell Craigs. It also occurs on the south side of Moffat Dale in Birkie Cleuch and Selcoth.

Diphasiastrum alpinum (Alpine Clubmoss) **DAR 3 sites. Current Monads 15.**

At high levels in short grassland this can be plentiful as DAR suggested. It is still present in the locations he noted and present on most of the high hills where conditions suit it between 460 m and 700 m. It is also well distributed on the south side of Moffat Dale from Bodesbeck to Croft Head.

Dryopteris expansa (Northern Buckler-fern) **DAR sites 1. Current Monads 2.**

Thought to be palatable so may only be evident once grazing is removed or in the deeper scree crevices. DAR notes that this was not recognised when he made his first visits but thought he might have seen it under Water Craig. It was found by F.J. Roberts in the enclosure on White Coombe and subsequently by C. Miles within the fence at Midlaw. DAR's specific location needs checking.

Dryopteris oreades (Mountain Male-fern) **DAR sites 2. Current Monads 38.**

DAR noted that this was probably widespread in screes and rock outcrops. It is now known to be in all areas in the hills on both sides of Moffat Dale extending west to the Beef Tub. It is usually in higher screes but has been found from 200 m to 700 m.

Empetrum nigrum subsp. *hermaphroditum* (Mountain Crowberry) * **DAR sites 1. Current Monads 6.**

This subspecies occurs at high levels and can take over from the commoner subspecies. Both are present in the Moffat Hills and can grow together. Most *Empetrum* here is *E. nigrum* subsp. *nigrum*. However it is possible to find plants with fruit and the remains of stamens still attached. It is recorded at high levels along the Mid Craig, White Coombe, Carrifran ridge. Not seen on the south side of Moffat Dale.

Epilobium alsinifolium (Chickweed Willowherb) * **DAR sites 4. Current Monads 8.**

First mentioned for Dumfriesshire in 1789. Occurs in basic springs, rills and flushes and on wet rocks. DAR notes that it is locally abundant. But more recent recording is generally of small clumps. It can occur in valley bottoms as in Carrifran where it may have been washed down and may be able to survive on lower ground in back pools once grazing has been removed. Not seen on the south side of Moffat Dale.

Epilobium anagallidifolium (Alpine Willowherb) * **DAR sites 3. Current Monads 8.**

First mentioned in Dumfriesshire in 1843. Local in high springs and flushes from 570 m to 730 m. Generally more specific in its habitat preferences and less robust than *E alsinifolium*. May suffer as a result of reduced grazing of high level flushes where taller vegetation can dominate. Not seen on the south side of Moffat Dale.

Equisetum pratense (Shady Horsetail) **DAR sites N/A. Current Monads 3.**

Known from Dumfriesshire since 1886. A plant of hill slopes and screes as well as wooded valleys. Not found until 2017 by C. Miles along the banks of the Lochan Burn below Hartfell. Now also found in scree on the south side of Moffat Dale above Craigmichan scar at 500 m.

Eriophorum latifolium (Broad-leaved Cottongrass) **DAR sites 1. Current Monads 11.**

A plant of calcareous flushes usually on sloping ground. Not yet seen again in DAR's original site in Blackshope but recorded more widely from the other valleys and most frequently from flushes on hills on the south side of Moffat Dale.

Ervilla sylvatica (Wood Vetch) **DAR sites 2. Current Monads 1.**

Dry to moist basic rocks. It was rare in DAR's experience having declined in Grey Mare's Tail from a former luxuriant growth. It has not been refound in his two localities and is likely lost at the GMT. It does persist as a small clump in the Hang Gill where first seen in 1964.

Euphrasia frigida (Upland Eyebright) **DAR sites N/A. Current Monads 4.**

A plant of wet cliff ledges with a basic influence. Part of the critical *Euphrasia* sp. complex which DAR did not include on his list. It is a plant usually found above 400 m. Known from the Moffat Hills since 1907. It has not been seen again in the original location but has been found in four monads since 2000.

Galium boreale (Northern Bedstraw) **DAR sites 6. Current Monads 11.**

Known in these hills since 1896. Widely dispersed on basic rocks and grassland where it can be grazed short. Once grazing is removed it can be very conspicuous when in flower as in Carrifran above Firthhope Burn. Also known from the hills on the south side of Moffat Dale in two monads.

Geranium sylvaticum (Wood Crane's-bill) **DAR widespread. Current Monads 46.**

Most noticeable where not grazed on ledges or in ravines. Can also occur in hill pasture near flushes. Extends to low levels along the main water courses. Now

known throughout the area with appropriate habitat in both the Moffat Hills and hills on the south side of Moffat Dale.

Hammarbya paludosa (Bog Orchid) **DAR sites N/A. Current Monads 1.**

A pseudobulbous plant of wet places growing on sphagnum or wet mud or peat where there is water movement. First found in 2020 by members of Dumfriesshire Botany Group. There is a small population in wet stoney runnels on the hills on the south side of Moffat Dale.

Helianthemum nummularium (Common Rock-rose) **DAR sites 2. Current Monads 9.**

A plant of basic flushed rocks and grassland. DAR noted the absence of this species from the main Moffat Hills it being recorded in the Beeftub and Skirtle Craig only. It is infrequent but still known from the same area and other hills slopes west of Hartfell. It is more frequently recorded from the hills on the south side of Moffat Dale especially in the Selcoth valley.

Huperzia selago (Fir Clubmoss) **DAR sites 3. Current Monads 46.**

Recorded since 1882. DAR said locally plentiful on acid rocks, screes and mountain grassland. Also on stable peat. Frequent though never an abundant component of vegetation. This is present in all the Moffat hills from the Beeftub to Loch Craig and along the whole south Moffat Dale hill ridge.

Hymenophyllum wilsonii (Wilson's Filmy-fern) **DAR sites 5 (various places in Black's Hope). Current Monads 16.**

Shady rocks in damp ravines and on high crags. Sometimes in small quantity but occasionally in extensive sheets on rocks or in short grassland and moss. These hills are quite an eastern station for the species. It has been re-recorded in all of DAR's sites except Ravens Craig and in several new locations. It is most frequent in the Moffat Hills with only four monads on the south side of Moffat Dale.

Isoetes lacustris (Quillwort) **DAR sites 1. Current Monads 2.**

This occurs in shallow nutrient poor water bodies with stoney substrates. It has been known in Loch Skeen since at least 1854. It persists there in two monads.

Melica nutans (Mountain Melick) **DAR sites 1. Current Monads 4.**

This grass grows on basic rock ledges in shady places. It is still present in the Gray Mare's Tail gorge where DAR saw it. It has been found in addition in three other places all in similar shaded gorge conditions. One of these is in the Selcoth valley on the south side of Moffat Dale.

Meum athamanticum (Spiguel) **DAR sites 1. Current Monads 1.**

This plant likes good neutral to acid soil. It is more of a lowland species but has been known in the Moffat Hills since the Flora in 1896. DAR noted one location in the upper tail gorge which has not been refound. It is currently known from a good-sized population on the SE slopes of White Coombe at Upper Tarnberry at 585 m. This is one of the species' highest altitudes in Britain.

Micranthes nivalis (Alpine Saxifrage) ** **DAR sites 1. Current Monads 0.**

Dry shaded rocks. This plant was found by the Victorian Moffat botanist J.T. Johnstone in 1889. DAR refound it in 1956 when there were 29 plants and saw it for the last time in 1973 when there were 7 plants, a reduction which he put down to a rockfall. It has not been refound since despite searches in the location.

Micranthes stellaris (Starry Saxifrage) **DAR sites widespread. Current Monads 53.**

Known in these hills since at least 1896. Mildly acid springs, flushes or burns. Widespread as DAR noted. This species is present at high and low altitudes in the hills on both sides of Moffat Dale and with multiple occurrences in some monads.

Myosotis stolonifera (Pale Forget-me-not) **DAR sites 2. Current Monads 16.**

This plant likes mildly basic springs or flushes. It is still known from DAR's two sites below Dobs Linn and above the Midlaw. Its distribution is now known to extend to mostly high-level sites from Hartfell in the west to Loch Craig slopes in the Moffat Hills and in a couple of places in the hills on the south side of Moffat Dale.

Myosotis × *bollandica* **DAR sites N/A. Current Monads 1.**

This hybrid between *M. secunda* and *M. stolonifera* occurs uncommonly within the range of the rarer parent. It was found in the Carrifran valley by Rod Corner in 2011 and was still persisting in 2018.

Neottia cordata (Lesser Twayblade) **DAR sites 2. Current Monads 23.**

Growing on *Sphagnum* under *Calluna*. As DAR suggested this has proved to be widespread once looked for. It is now known from many areas of the hills where this habitat is found. This includes from the Beeftub to Lochcraig and a couple of records from the Lochfell and Selcoth area on the south side of Moffat Dale.

Orthilia secunda (Serrated Wintergreen) **DAR sites 2. Current Monads 1.**

A species of acid rocks in ravines. This species was more frequently recorded 100 years ago in the 1896 Flora. It has not been seen since 2000. It was seen in the

Carrifran Burn ravine in 1998 but has not been seen in DAR's locations since the 1950s.

Oxyria digyna (Mountain Sorrel) * **DAR sites 10. Current Monads 17.**

On dry and basic rock and scree on cliffs, in ravines and spreading along water courses where grazing has been removed. DAR noted that this was widespread on all the main crags and that remains the case. In recent years with the removal of grazing stock it has colonised new areas along the main burn in the Carrifran Valley. It does not occur on the hills on the south side of Moffat Dale.

Persicaria vivipara (Alpine Bistort) **DAR sites 5. Current Monads 13.**

In damp flushed grassland or amongst rocks and on ledges. It has been re-recorded in four of DAR's sites as well as several other locations from Corehead to White Coombe and from Fauldside to Crofthead Hill on the south side of Moffat Dale. It is present in large populations in grassland above the Spoon Burn and the Selcoth Burn.

Polystichum lonchitis (Holly Fern) * **DAR sites 1. Current Monads 0.**

On calcareous rocks in Black's Hope where known since 1872. DAR counted 20 small plants in 1956 close to an old raven's nest site. Despite searches here it has not been refound.

Potentilla crantzii (Alpine Cinquefoil) **DAR sites 3. Current Monads 4.**

On calcareous rocks. Not refound in two of DAR's sites. Only in the main valleys of the Moffat Hills though DAR's site in the Carrifran needs refinding.

Rhinanthus minor subsp. *monticola* **DAR N/A. Current Monads 2.**

This is a distinctive plant of hill grassland and basic rocks. It is a small autumn flowering segregate of the *Rhinanthus minor* complex with brown tinged flowers. DAR mentions *Rhinanthus minor* subsp. *borealis* on basic rocks in the Carrifran and Black's Hope. No more recent records for this are currently known and it is not currently mapped in the Southern Uplands. But *R. minor* subsp. *monticola* has a record from 1954 and has more recently been recorded from the Loch Skeene and Midlaw area.

Rubus chamaemorus (Cloudberry) **DAR abundant on blanket bog. Current Monads 42.**

Known here since at least the 1896 Flora. DAR noted its abundance in most places with deep peat where it grows in valley or summit mires. It is concentrated in the

high hills on both sides of Moffat Dale. It extends patchily to the western slopes of Hartfell and Gateshaw Rig on the south side of Moffat Dale.

Rubus saxatilis (Stone Bramble) **DAR sites 4. Current Monads 7.**

Known at the Grey Mare's Tail since 1858. On calcareous rocks, usually in shade. Probably recorded from two of DAR's sites. Otherwise rather scattered. It also occurs on the hills on the south side of Moffat Dale in a couple of ravines.

Salix herbacea (Dwarf Willow) * **DAR sites 4. Current Monads 7.**

In short high montane grassland generally where it is wind clipped or in high level block scree. First recorded on White Coombe in 1834. Re-recorded in three of DAR's sites but not Hartfell Craig. DAR suggests it is locally abundant. It seems more restricted to small patches today except on Lochcraig where it is more extensive. It does not occur in the hills on the south side of Moffat Dale.

Salix lapponum (Downy Willow) * **DAR sites 1. Current Monads 1 (plus 9 where planted).**

Moist basic craigs. Known from the White Coombe cliffs since 1762. It still occurs here but in recent years it has been planted in several locations in the Beeftub, Carrifran and Midlaw where grazing has been removed or it is protected from grazing. The source of the planted material is not known to the Vice-County Recorder.

Salix × *obtusifolia* (*S. aurita* × *S. lapponum*) ** **DAR sites N/A Current monads 1**

A rare hybrid willow intermediate between the parents but usually growing close to the *S. lapponum* parent and therefore very restricted in the Southern Uplands. This is the only occurrence known outside the highlands. Found by Rod Corner in 2006.

Salix myrsinifolia (Dark-leaved Willow) **DAR sites N/A. Current Monads 15 (plus 1 where planted).**

A willow of hill slopes, riversides and mires. It was not listed by DAR but its distribution is much better known today. On the lower slopes as well as higher ground in both Moffat and the hills on the south side of Moffat Dale. Now also planted in Carrifran.

Salix × *tetrapla* (*S. mysinifolia* × *S. phyllicifolia*) **DAR N/A. Current Monads 6.**

Intermediate between the parents. Occupies the same habitats as the parents and often the taxon found at higher elevations rather than one of the parents.

Salix phylicifolia (Tea-leaved Willow) **DAR sites N/A. Current Monads 7 (plus 10 where planted).**

A willow of wet calcareous rocks or beside water courses. It was not mapped by DAR. It is present as single bushes on water sides or ledges out of reach of grazers. It has been planted in the Carrifran and Corehead areas and Midlaw. It is becoming difficult to distinguish the small number of native plants from the planted material.

Saxifraga hypnoides (Mossy Saxifrage) **DAR sites 6 (some with several locations). Current Monads 33.**

On wet rocks, banks, flushes and screes and edges of water courses. DAR suggests this is widespread and common. It continues to be found in the places where he recorded it. It is now known to extend more widely from the Beeftub to Loch Craig and on the south side of Moffat Dale at higher levels of the Selcoth Valley and in rocky cleuchs opposite GMT and Dobs Linn.

Saxifraga oppositifolia (Purple Saxifrage) * **DAR sites 1. Current Monads 1.**

On dry to moist calcareous rocks. It occurs on the rocks beside the main Grey Mare's Tail waterfall where several plants occur in a relatively small area (53 patches reported in 2014 by R. Clarkson, NTS ranger). It has persisted here since at least 1848. This is one of only three locations where it is known in the south of Scotland.

Saussurea alpina (Alpine Saw-wort) * **DAR sites 4. Current Monads 7.**

On basic rocks or flushed grassland at higher levels. Not refound in one of DAR's sites (Saddle Craigs) but still present in the others. Now also known from two monads on Smidhope and White Shank Hills on the south side of Moffat Dale (it is also known on the Selkirkshire side of these hills).

Sedum rosea (Roseroot) **DAR sites 8 (Black's Hope and Carrifran with several locations). Current Monads 15.**

Dry to moist basic rocks and ledges often where water dribbles. Known in the hills since at least 1896. DAR said it was locally abundant. It is widespread on suitable rock faces. Still present in most if not all of DAR's locations (5 monads in Black's Hope, 4 in Carrifran). Extends to the west slope of Hartfell. Not known on the south side of Moffat Dale.

Sedum villosum (Hairy Stonecrop) **DAR sites 2. Current Monads 9.**

In basic flushes or at the sides of small streams. Known here since at least the Flora in 1896. Tricky to find when not in flower. DAR suggested that this was rare and had already been lost from one of his two sites in a low-level field. His high-level site in Black's Hope has not been refound though it is present high on the west slope of Hart Fell. Also, at lower levels near Dobs Linn and in two places in the Selcoth Valley.

Silene uniflora (Sea Campion) **DAR sites 10. Current Monads 21.**

On dry acid rocks or gravels in streams or riversides. DAR noted that this was plentiful on most of the Craigs. This area is one of the places where this species is truly montane and is noted in the 1896 Flora at Grey Mare's Tail and Whitecoombe. In recent years reduced grazing has allowed the plant to spread off the craigs down burns particularly in the Carrifran valley and it has now extended out onto gravels along the Moffat Water itself. DAR knew it was at Craigmichen on the south side of Moffat Dale and it is still present and spreading in the Selcoth Valley.

Subularia aquatica (Awlwort) ***DAR sites 1. Current Monads 2.**

Silty gravel and stones in shallow oligotrophic lochs. DAR knew it from Loch Skeen where it was recorded in 1830 and it is still present in two monads including the small shallow area at the southern end of the Loch.

Thalictrum alpinum (Alpine Meadow-rue) **DAR sites 8 (some with several locations). Current Monads 25.**

Known on Hartfell since 1789. Wet flushed grassland with some calcareous influence and on rocks usually on higher slopes but below 300 m in Dobs Linn. DAR said it was locally abundant and that still applies. It can extend across extensive areas or be restricted to small flush features. It is still known in all of DAR's locations except Loch Craig. It also extends westwards to Corehead and is frequent and in places extensive on the south side of Moffat Dale between Bodesbeck and Capel Fell.

Thalictrum minus (Lesser Meadow-rue) **DAR's sites 5. Current Monads 5.**

On dry and wet basic rocks. Known from the Grey Mare's Tail since 1889. DAR says very local. It has not been refound in three of his locations on White Coombe, Midlaw or Carrifran. It remains quite well established on the Black's Hope rocks and the Tail Burn rocks and rather like *Silene uniflora* (Sea Campion) seems to behave like a true montane plant in these hills.

Trollius europaeus (Globe Flower) **DAR sites 8. Current Monads 22.**

Moist basic rocks and neutral to calcareous grassland. A plant that has been suppressed by grazing. Its recovery in the absence of grazers in the Carrifran has been quite dramatic. DAR said it was local and was likely seeing it only on ledges away from grazing animals. It is still present as small non flowering plants in the calcareous flushed grassland on the south side of Moffat Dale between Smidhope and Fauldsides Hills. Known from at least three sites in these hills since 1896.

Vaccinium uliginosum (Bog Bilberry) ***DAR sites 3. Current Monads 7.**

First found on Whitecoombe in 1891 by J.T. Johnstone. Dry acid rocks and heath on blanket bog at high levels. This was rare in DAR'S time and remains fragmentary

today. It is still in two of DAR's sites. New patches have been found recently including in the well botanised Midlaw Linn and near the summit of Whitecoomb at just over 800 m but they remain small and restricted in extent.

Vicia orobus (Wood Bitter-vetch) **DAR sites 0. Current Monads 1.**

A plant normally of slightly acid to neutral soils but on a rock ledge here. Although recorded in the Victorian period DAR thought it was extinct in the hills. One robust plant was found in the Carrifran by H. Lang in 1981 and it was still there in 2009. This plant appears to hold the UK altitude record for this species at around 540 m.

Viola lutea (Mountain Pansy) **DAR sites 4. Current Monads 20.**

In grassland in dry to moist neutral to calcareous soils. As DAR says it is all the blue/purple flowered form with a yellow splash. Still known at all of his locations but also more widely recorded now. It is frequent in the Beeftub and present on the calcareous grassland on the Smidhope to Faulds side ridge on the south side of Moffat Dale.

Woodsia ilvensis (Oblong Woodsia) ** **DAR sites 2. Current Monads 2 (plus 4 where planted).**

First recorded in 1848 it grows in horizontal cracks and fissures in acid rocks. DAR refound this species in 1954. It had been thought exterminated by Victorian collecting. It was then found in another location as well. Both persist but with very small numbers of individuals. Work carried out by Royal Botanic Garden, Edinburgh, to grow plants from spores collected on site, is successful and ongoing. Reinforcement plantings have occurred in places where it was once known, or which look suitable but these have struggled to establish long lived plants.

Conclusion

We now know that the majority of the montane and submontane plants listed by DAR still occur and for many they are known to be present in more locations than when DAR was writing both in the 1950s and 1990. It might be that the limited land use changes and positive action to conserve these plant communities including conservation led ownerships have helped them survive and, in a few cases, to expand their presence.

Only a couple of DAR's species, *Micranthes nivalis* and *Polystichum lonchitis*, have so far evaded being refound. In the 1950s DAR made some important new discoveries, for example finding *Alopecurus borealis* for the first time outside the Highlands. He had noted himself the possibility of finding new things given the lack of survey work since Victorian times. During the recent systematic recording some new species of note have been added to the flora of these hills. This includes *Alchemilla glomerulans*, *Equisetum pratense* and *Hammarbya paludosa*. There remains the probability of finding further new populations of some members of this special plant community and also the possibility of not only refinding old previously

recorded populations but also additional species by botanists visiting this area in the future.

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