Review of the Status of the Montane Flora of the Irish Uplands

PART 1: NATIONAL OVERVIEW

Fringed Sandwort (*Arenaria ciliata*)

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Fig. 1 Mountain Sorrel (*Oxyria digyna*)

The Montane Flora of Ireland

Although Ireland's mountains do not have as rich or varied a flora as many other European countries, due to their low altitude, relatively southerly location and the general paucity of Ireland's flora, specialist montane plants still form an important component of the vegetation. These are generally species of Arctic-montane or Arctic-Alpine distribution that, in Ireland, are restricted, or mainly restricted, to higher altitudes. Most Irish mountain areas, particularly those over 600m in altitude, support some specialist montane species, although the richest variety of species occurs in western coastal counties.

In a broad sense, there are two primary habitats for the growth of these species, exposed mountain summits and ridges and cliffs and rocky habitats on mountain slopes and in sheltered corries. On the mountain summits, these species grow in montane heath and alpine grassland (both siliceous and, in a very limited area, calcareous), with both types of alpine grassland defined by the presence of at least one Arctic-montane or Arctic-Alpine species. These habitats are exposed and windswept and only occur extensively above ca. 500-600m altitude. The richest habitat for a range of montane species is damp, sheltered cliffs with base-rich influence, either derived from the bedrock, or through flushing of base-rich water. The flora of acidic rockfaces is generally more restricted and reaches its fullest composition on damp and sheltered ledges and cracks. Stable scree slopes can also provide habitat for a number of specialist species.

Specialist montane species are threatened by a number of impacts. Most of these species are highly sensitive and cannot tolerate overgrazing by sheep, and are therefore restricted to small areas of cliff that are out of reach and inaccessible to grazing animals. With lower grazing pressure, many of these species would be able to colonise a wider area than they currently occupy and would also thrive on damp slopes below many cliffs. On mountain summits and where walking and climbing routes are in place to access the summits, these species and their habitats are threatened by trampling and erosion, which is particularly an issue on more popular and frequently visited mountains. This especially impacts species that find their niche on mountain summits and ridges. As these species are at the edge of their range in Ireland altitudinally, they have the potential to be disproportionately impacted by climate change. If rising temperatures lead to lower altitude areas becoming unsuitable for their survival and increases competition from more vigorous species, there is very little higher altitude ground for these species to migrate to, as they already occur close to the summits of most sites in which they grow in Ireland. In light of the threats outlined above, it is vital to know exactly where these species occur, so that measures can be put in place to protect them and changes in their distribution can be detected in a timely manner.

About this project

This project aims to list the specialist montane vascular plant species occurring within each upland Special Area of Conservation (SAC) within the Republic of Ireland, and the date of their last known occurrence, in order to highlight and quantify the importance of the montane flora of each upland area. Areas outside of the SAC network hosting important montane species were also identified, with the most important of these highlighted. More detailed analyses were carried out of the montane flora of two of the most important and largest upland SACs, Wicklow Mountains SAC and Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC, outlined in two separate reports.

A list of specialist montane species was derived (see following section) using a combination of expert judgement and by consulting the available relevant literature. Records of these species for the whole of Ireland were extracted from the Distribution Database (DDb) of the Botanical Society of Britain and Ireland (BSBI), totalling almost 10,000 in number. These records are at a range of resolutions from 10km grid square (hectad) down to one metre accuracy and range in date from

1862 to 2024. Using Q-GIS, an intersect was carried out between these records and the SAC network, to derive lists of records assigned to each SAC and lists of records not falling within any SAC. The data were manually inspected to remove any non-upland SACs that may overlap with records from upland SACs and records from various SACs within the Burren were removed, as although of very high conservation value, this area cannot be considered montane and exists as a anomaly in many respects, in terms of the species that occur there. The year of the most recent record for each species within each SAC was also derived from these data. The records from locations outside of SACs were grouped by 10km grid square and were assigned to a site using expert knowledge and in consultation with Ordnance Survey mapping. The species lists for individual SACs and sites outside of SACs were cross referenced to ensure that no species were wrongly assigned or erroneously listed twice. Records within the two abovementioned SACs that were analysed at finer detail, records were grouped by 10km square and assigned to specific sites based on expert judgment and locality details contained within the records. In all instances, no recorder names have been included within the outputs, to protect recorder confidentiality, and no precise location details of any species have been included, to protect their location.

Specialist Montane Species

A total of 35 species were identified as either being exclusively montane in Ireland, or restricted almost exclusively to montane habitats. A number of species included on the list also occur in lowland situations in the Burren or occasionally occur at sea-level in coastal situations, e.g. Irish saxifrage (*Saxifraga rosacea* subsp. *rosacea*) and Hoary Whitlowgrass (*Draba incana*)*Draba incana*), but were considered to be primarily species of montane habitats, and characteristic of the montane vegetation in which they occur. Some species, such as Lemon-scented Fern (*Oreopteris limbosperma*) and Lesser Twayblade (*Neottia cordata*), have many of their occurrences in upland areas, but occur around the lower margins and cannot be considered as montane species, so were excluded from the list. Some species that are characteristic of certain montane habitats, including Brittle-bladder Fern (*Cystopteris fragilis*) and Fir Clubmoss (*Huperzia selago*), were excluded from the final list, as they are also relatively widespread across multiple areas of Ireland in lowland habitats. The following species were included in the final list:

Fig. 2 Alpine Saxifrage (*Micranthes nivalis*)

English name	Latin name	Irish red list status [1]	Primary habitats
Alpine Lady's-mantle	*Alchemilla alpina*	VU	Damp cliffs and rocky slopes
Northern Rock-cress	*Arabidopsis petraea*	VU	Base-rich cliffs
Bearberry	*Arctostaphylos uva-ursi*	LC	Heath on summits and ridges
Fringed Sandwort	*Arenaria ciliata*	VU	Calcareous alpine grassland and rocky outcrops
Green Spleenwort	*Asplenium viride*	LC	Base-rich cliffs
Alpine Bistort	*Bistorta vivipara*	VU	Base-rich cliffs and exposed ridges
Stiff Sedge	*Carex bigelowii*	LC	Exposed ridges and summits
Pyrenean Scurvygrass	*Cochlearia pyrenaica* subsp. *alpina*	LC	Base-rich cliffs
Parsley Fern	*Cryptogramma crispa*	VU	Acidic rockfaces and scree
Alpine Hair-grass	*Deschampsia cespitosa* subsp. *alpina*	WL	Damp cliffs and rocky slopes
Alpine Clubmoss	*Diphasiastrum alpinum*	NT	Exposed ridges and summits
Hoary Whitlowgrass	*Draba incana*	LC	Base-rich cliffs
Mountain Avens	*Dryas octopetala*	LC	Base-rich cliffs
Mountain Male-fern	*Dryopteris oreades*	WL	Siliceous scree and cliffs
Chickweed Willowherb	*Epilobium alsinifolium*	EN	Base-rich cliffs
Stag's-horn Clubmoss	*Lycopodium clavatum*	NT	Heath on summits and ridges
Alpine Saxifrage	*Micranthes nivalis*	CR	Base-rich cliffs
Starry Saxifrage	*Micranthes stellaris*	LC	Flushes and damp cliffs
Recurved Sandwort	*Minuartia recurva*	VU	Acidic ridges and rockfaces
Mountain Sorrel	*Oxyria digyna*	LC	Damp cliffs and rocky slopes
Alpine Meadow-grass	*Poa alpina*	EN	Exposed summits and calcareous rocky slopes
Holly-fern	*Polystichum lonchitis*	VU	Base-rich cliffs
Cloudberry	*Rubus chamaemorus*	CR	Heath on summits and ridges
Dwarf Willow	*Salix herbacea*	NT	Exposed ridges and summits
Tea-leaved Willow	*Salix phylicifolia*	EN	Base-rich cliffs
Alpine Saw-wort	*Saussurea alpina*	VU	Base-rich cliffs
Yellow Saxifrage	*Saxifraga aizoides*	LC	Base-rich cliffs and flushes
Mossy Saxifrage	*Saxifraga hypnoides*	LC	Base-rich cliffs
Purple Saxifrage	*Saxifraga oppositifolia*	LC	Base-rich cliffs
Irish Saxifrage	*Saxifraga rosacea* subsp. *rosacea*	NT	Damp cliffs and rocky slopes
Moss Campion	*Silene acaulis*	LC	Calcareous alpine grassland and cliffs
Alpine Meadow-rue	*Thalictrum alpinum*	LC	Base-rich cliffs
Dwarf Juniper	*Juniperus communis* subsp. *nana*	LC	Heath on summits and ridges
Roseroot	*Rhodiola rosea*	LC	Damp cliffs and rocky slopes
Cowberry	*Vaccinium vitis-idaea*	LC	Heath on summits and ridges

[1] Red list status as follows: CR = Critically Endangered, EN = Endangered, VU = Vulnerable, LC = Least Concern, WL = Waitlisted, LC = Least Concern. From: Wyse Jackson, M., FitzPatrick, Ú., Cole, E., Jebb, M., McFerran, D., Sheehy Skeffington, M. & Wright, M. (2016) *Ireland Red List No. 10: Vascular Plants*. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Dublin.

Important SACs for Montane Plants

Arroo Mountain SAC, Co. Leitrim (SAC 0001403)

The limestone cliffs of this mountain, at moderate altitudes of up to 500m, support a rich calcicole flora, similar to that of the nearby Ben Bulben massif across Glenade, but slightly less diverse. Specialist species of this habitat present on Arroo include Tea-leaved Willow (*Salix phylicifolia*), Holly-fern (*Polystichum lonchitis*) and Moss Campion (*Silene acaulis*). All of the specialist species known from this site have been seen since 2000.

English name	Latin name	Date of last record
Green Spleenwort Pyrenean	*Asplenium viride*	2023
Scurvygrass	*Cochlearia pyrenaica* subsp. *alpina*	2005
Hoary Whitlowgrass	*Draba incana*	2005
Mountain Sorrel	*Oxyria digyna*	2005
Holly-fern	*Polystichum lonchitis*	2021
Roseroot	*Rhodiola rosea*	2007
Tea-leaved Willow	*Salix phylicifolia*	2012
Yellow Saxifrage	*Saxifraga aizoides*	2012
Mossy Saxifrage	*Saxifraga hypnoides*	2023
Purple Saxifrage	*Saxifraga oppositifolia*	2012
Irish Saxifrage	*Saxifraga rosacea* subsp. *rosacea*	2012
Moss Campion	*Silene acaulis*	2012
Cowberry	*Vaccinium vitis-idaea*	2011

Ben Bulben, Gleniff and Glenade Complex SAC, Co. Sligo/Leitrim (SAC 000623)

This mountain range is the richest and most important site in Ireland for montane plants, due to the abundance of exposed limestone rock outcrops and cliffs at moderately high altitude. Fringed Sandwort (*Arenaria ciliata*), Chickweed Willowherb (*Epilobium alsinifolium*) and Alpine Saxifrage (*Saxifraga nivalis*) grow nowhere else in Ireland, while a number of other species including Northern Rock-cress (*Arabidopsis petraea*), Alpine Bistort (*Bistorta vivpara*), Alpine Meadow-grass (*Poa alpina*) and Tea-leaved Willow (*Salix phylicifolia*) are very rare across Ireland. Some rare montane species, including Holly-fern (*Polystichum lonchitis*), Green Spleenwort (*Asplenium viride*), Moss Campion (*Silene acaulis*) and Purple Saxifrage (*Saxifraga oppositifolia*) are widespread and sometimes abundant at this site where calcareous rock outcrops. The montane heath on the higher summits also supports a number of specialist species, including Stag's-horn Clubmoss (*Lycopodium clavatum*), Stiff Sedge (*Carex bigelowii*) and Dwarf Willow (*Salix herbacea*). Alpine Saw-wort (*Saussurea alpina*) has not been seen at this site since 1989 and Alpine Clubmoss (*Diphasiastrum alpinum*) has not been recorded since 1945.

Fig. 3 Calcareous rocky slopes, Ben Bulben, Glenade and Gleniff Complex SAC

English name	Latin name	Date of last record
Northern Rock-cress	*Arabidopsis petraea*	2015
Fringed Sandwort	*Arenaria ciliata*	2023
Green Spleenwort	*Asplenium viride*	2023
Alpine Bistort	*Bistorta vivipara*	2012
Stiff Sedge Pyrenean	*Carex bigelowii*	2012
Scurvygrass	*Cochlearia pyrenaica* subsp. *alpina*	2015
Alpine Clubmoss	*Diphasiastrum alpinum*	1945
Hoary Whitlowgrass	*Draba incana*	2020
Mountain Avens Chickweed	*Dryas octopetala*	2016
Willowherb	*Epilobium alsinifolium*	2023
Stag-horn's Clubmoss	*Lycopodium clavatum*	2007
Alpine Saxifrage	*Micranthes nivalis*	2011
Mountain Sorrel	*Oxyria digyna*	2023
Alpine Meadow-grass	*Poa alpina*	2012
Holly-fern	*Polystichum lonchitis*	2020
Roseroot	*Rhodiola rosea*	2023
Dwarf Willow	*Salix herbacea*	2012
Tea-leaved Willow	*Salix phylicifolia*	2023
Alpine Saw-wort	*Saussurea alpina*	1989
Yellow Saxifrage	*Saxifraga aizoides*	2023
Mossy Saxifrage	*Saxifraga hypnoides*	2023
Purple Saxifrage	*Saxifraga oppositifolia*	2023
Irish Saxifrage	*Saxifraga rosacea* subsp. *rosacea*	2016
Moss Campion	*Silene acaulis*	2023
Alpine Meadow-rue	*Thalictrum alpinum*	2007
Cowberry	*Vaccinium vitis-idaea*	2016

Blackstairs Mountains SAC, Co. Carlow/Wexford (SAC 000770)

The mountains are mostly covered by heath and bog vegetation, with little outcropping rock, limiting the niches available to specialist montane plants. Stiff Sedge (*Carex bigelowii*) and Cowberry (*Vaccinium vitis-idaea*) grow on the higher summits and ridges and Starry Saxifrage (*Micranthes stellaris*) occurs rarely in flushes on the slopes. Mossy Saxifrage (*Saxifraga hypnoides*) has been previously recorded from this site, but the last record was made in 1998.

English name	Latin name	Date of last record
Stiff Sedge	*Carex bigelowii*	2020
Starry Saxifrage	*Micranthes stellaris*	2020
Mossy Saxifrage	*Saxifraga hypnoides*	1998
Cowberry	*Vaccinium vitis-idaea*	2024

Boleybrack Mountain SAC, Co. Leitrim/Cavan (SAC 002032)

This site is of low importance for montane plants, as it does not attain high altitudes or have outcrops of base rich rock. Cowberry (*Vaccinium vitis-idaea*) occurs at a number of locations on the undulating summit plateau in heath and bog vegetation.

English name	Latin name	Date of last record
Cowberry	*Vaccinium vitis-idaea*	2019

Brickleive Mountains and Keishcorran SAC, Co. Sligo (SAC 001656)

Although these hills are limestone and have extensive calcareous rock outcrops, they do not attain the necessary altitude for most specialist montane species to grow. The exception to this is Green Spleenwort (*Asplenium viride*), which grows on cliffs at moderate altitude at a number of locations within the site. Hoary Whitlowgrass (*Draba incana*) and Mossy Saxifrage (*Saxifraga hypnoides*) also grow in the higher parts of the site.

English name	Latin name	Date of last record
Green Spleenwort	*Asplenium viride*	2022
Hoary Whitlowgrass	*Draba incana*	2017
Mossy Saxifrage	*Saxifraga hypnoides*	2024

Caha Mountains SAC, Co. Kerry/Cork (SAC 000093)

The main botanical interest of this rocky and exposed mountain range occurs around rocky outcrops and in montane heath on the higher ridges. The most significant species that occurs within this site is Recurved Sandwort (*Minuartia recurva*), which is known from only one other location in Ireland, and is unknown in Britain, but grows in abundance on a small area of Knockowen. Stiff Sedge (*Carex bigelowii*) and Dwarf Willow (*Salix herbacea*) also occur on the higher summits and ridges. Although rocks with basic influence are limited in extent, Green Spleenwort (*Asplenium viride*) and Roseroot (*Rhodiola rosea*) occur. Marsh Clubmoss (*Lycopodiella inundata*) was previously recorded near the summit of Knockowen, but has not been recorded since 1999.

English name	Latin name	Date of last record
Green Spleenwort	*Asplenium viride*	2014
Stiff Sedge	*Carex bigelowii*	2008
Recurved Sandwort	*Minuartia recurva*	2016
Roseroot	*Rhodiola rosea*	2016
Dwarf Willow	*Salix herbacea*	2016

Carlingford Mountain SAC, Co. Louth (SAC 000453)

The main habitat for montane specialists within this SAC is on dolerite rock oucrops and in montane heath areas on the higher ridges. Parsley Fern (*Cryptogramma crispa*) occurs sparingly in cracks of rock outcrops close to the ridge top, at one of only a few sites in the Republic of Ireland known to be extant. Alpine Clubmoss (*Diphasiastrum alpinum*) and Stag's-horn Clubmoss (*Lycopodium clavatum*) grow in montane heath, but Dwarf Willow (*Salix herbacea*) has not been seen here since before 1999. Bog Orchid (*Hammarbya paludosa*) grows in flushes near the summit of the western part of the range.

English name	Latin name	Date of last record
Parsley Fern	*Cryptogramma crispa*	2021
Alpine Clubmoss	*Diphasiastrum alpinum*	2019
Stag's-horn Clubmoss	*Lycopodium clavatum*	2022
Roseroot	*Rhodiola rosea*	2021
Dwarf Willow	*Salix herbacea*	1999
Cowberry	*Vaccinium vitis-idaea*	2021

Clare Island Cliffs SAC, Co. Mayo (SAC 002243)

The cliffs on the northern side of Clare Island fall 450m straight into the sea, and provide habitat for an unexpectedly rich variety of montane species in the upper parts where calcareous rocks outcrop. Amongst other rare montane species, an outlying population of Moss Campion (*Silene acaulis*) occurs here, south and west of its other Irish populations, alongside other uncommon species such as Holly-fern (*Polystichum lonchitis*) and Purple Saxifrage (*Saxifraga oppositifolia*). A number of montane species have not been seen in recent years, namely Green Spleenwort (*Asplenium viride*), Alpine Saw-wort (*Saussurea alpina*) and Irish saxifrage (*Saxifraga rosacea* subsp. *rosacea*).

English name	Latin name	Date of last record
Green Spleenwort	*Asplenium viride*	1910
Mountain Sorrel	*Oxyria digyna*	2018
Holly-fern	*Polystichum lonchitis*	2018
Roseroot	*Rhodiola rosea*	2022
Dwarf Willow	*Salix herbacea*	2018
Alpine Saw-wort	*Saussurea alpina*	1999
Purple Saxifrage	*Saxifraga oppositifolia*	2011
Irish Saxifrage	*Saxifraga rosacea*	1931
Moss Campion	*Silene acaulis*	2018

Cloghernagore Bog and Glenveagh National Park SAC, Co. Donegal (SAC 002047)

This large SAC contains a variety of montane habitats, which support a range of specialist montane species. A typical flora of exposed summits and ridges occurs on a number of peaks, with species present including Bearberry (*Arctostaphylos uva-ursi*), Stiff Sedge (*Carex bigelowii*), Alpine Clubmoss (*Diphasiastrum alpinum*) and Dwarf Willow (*Salix herbacea*). Parsley Fern (*Cryptogramma crispa*) grows on an acidic cliff in one location. There are also base-rich ledges and gullies in places, supporting a range of uncommon species including Alpine Saw-wort (*Saussurea alpina*) and Purple Saxifrage (*Saxifraga oppositifolia*). Moss Campion (*Silene acaulis*) has not been seen at this site since 1908, with a number of other species last recorded prior to the year 2000.

English name	Latin name	Date of last record
Bearberry	*Arctostaphylos uva-ursi*	2019
Green Spleenwort	*Asplenium viride*	1989
Stiff Sedge	*Carex bigelowii*	2018
Parsley Fern	*Cryptogramma crispa*	2018
Alpine Clubmoss	*Diphasiastrum alpinum*	2019
Dwarf Juniper	*Juniperus communis* subsp. *nana*	2018
Stag's-horn Clubmoss	*Lycopodium clavatum*	1989
Starry Saxifrage	*Micranthes stellaris*	2018
Mountain Sorrel	*Oxyria digyna*	2023
Roseroot	*Rhodiola rosea*	2023
Dwarf Willow	*Salix herbacea*	2019
Alpine Saw-wort	*Saussurea alpina*	2022
Purple Saxifrage	*Saxifraga oppositifolia*	1998
Moss Campion	*Silene acaulis*	1908
Alpine Meadow-rue	*Thalictrum alpinum*	1998
Cowberry	*Vaccinium vitis-idaea*	2018

Comeragh Mountains SAC, Co. Waterford (SAC 001952)

Specialist upland species are relatively sparsely scattered across this large upland area, occurring both on the broad summit plateau and the large corries and cliffs around the flanks. Recurved Sandwort (*Minuartia recurva*) grows on cliffs in one location, at only one of two Irish sites for this species. Alpine Clubmoss (*Diphasiastrum alpinum*) grows in one location on the summit plateau, with Stiff Sedge (*Carex bigelowii*) and Dwarf Willow (*Salix herbacea*) not recorded in the past 15 years at this site.

English name	Latin name	Date of last record
Stiff Sedge	*Carex bigelowii*	2001
Alpine Clubmoss	*Diphasiastrum alpinum*	2015
Starry Saxifrage	*Micranthes stellaris*	2015
Recurved Sandwort	*Minuartia recurva*	2022
Roseroot	*Rhodiola rosea*	2009
Dwarf Willow	*Salix herbacea*	2008
Mossy Saxifrage	*Saxifraga hypnoides*	2016
Cowberry	*Vaccinium vitis-idaea*	2004

Corraun Plateau SAC, Co. Mayo (SAC 000485)

This broad upland plateau with a number of deep corries is host to a range of specialist montane plants. The plateau is covered by large areas of montane heath and associated vegetation, containing species such as Stiff Sedge (*Carex bigelowii*) and Dwarf Willow (*Salix herbacea*), with Alpine Clubmoss (*Diphasiastrum alpinum*) last recorded in 1996. Some areas of base-rich rock occur in the corries, providing habitat for specialist species including Alpine Saw-wort (*Saussurea alpina*) and Purple Saxifrage (*Saxifraga oppositifolia*).

English name	Latin name	Date of last record
Bearberry	*Arctostaphylos uva-ursi*	2024
Stiff Sedge	*Carex bigelowii*	2016
Alpine Clubmoss	*Diphasiastrum alpinum*	1996
Dwarf Juniper	*Juniperus communis* subsp. *nana*	2024
Starry Saxifrage	*Micranthes stellaris*	1996
Roseroot	*Rhodiola rosea*	2003
Dwarf Willow	*Salix herbacea*	2024
Alpine Saw-wort	*Saussurea alpina*	2003
Purple Saxifrage	*Saxifraga oppositifolia*	2016

Croaghaun/Slievemore SAC, Co. Mayo (SAC 001955)

These two mountains exposed directly to the Atlantic Ocean at the western end of Achill Island primarily provide a habitat for species of exposed ridges and summits, such as Stiff Sedge (*Carex bigelowii*) and Dwarf Willow (*Salix herbacea*). In sheltered corries, on rockfaces flushed with mineral-rich water, there is a niche for other montane specialists like Mountain Sorrel (*Oxyria digyna*) and Roseroot (*Rhodiola rosea*).

English name	Latin name	Date of last record
Bearberry	*Arctostaphylos uva-ursi*	2024
Stiff Sedge	*Carex bigelowii*	2024
Dwarf Juniper	*Juniperus communis* subsp. *nana*	2024
Starry Saxifrage	*Micranthes stellaris*	2024
Mountain Sorrel	*Oxyria digyna*	2024
Roseroot	*Rhodiola rosea*	2024
Dwarf Willow	*Salix herbacea*	2024
Cowberry	*Vaccinium vitis-idaea*	1904

Cuilcagh - Anierin Uplands SAC, Co. Cavan/Leitrim (SAC 000584)

The cliffs of these mountains are generally acidic and do not support species indicative of basic conditions, with the exception of Roseroot (*Rhodiola rosea*), which occurs at one location on Slieve Anierin. The other montane species present, including Stiff Sedge (*Carex bigelowii*), Dwarf Willow (*Salix herbacea*) and Cowberry (*Vaccinium vitis-idaea*), generally occur on summits and ridges. Parsley Fern (*Cryptogramma crispa*) has not been recorded at this site since 1930.

English name	Latin name	Date of last record
Stiff Sedge	*Carex bigelowii*	2012
Parsley Fern	*Cryptogramma crispa*	1930
Roseroot	*Rhodiola rosea*	2020
Dwarf Willow	*Salix herbacea*	2019
Cowberry	*Vaccinium vitis-idaea*	2021

Derryclogher Bog (Knockboy) SAC, Co. Cork/Kerry (SAC 001873)

The montane botanical interest of this site is limited to exposed rocky outcrops interspersed with wet heath and bog, which support Stag's-horn Clubmoss (*Lycopodium clavatum*) and Dwarf Willow (*Salix herbacea*), the first of which has not been seen recently elsewhere in Southwest Ireland.

English name	Latin name	Date of last record
Stag's-horn Clubmoss	*Lycopodium clavatum*	2016
Dwarf Willow	*Salix herbacea*	2016

Fig, 4 Alpine Meadow-grass (*Poa alpina*)

Galtee Mountains SAC, Co. Tipperary/Limerick (SAC 000646)

The majority of botanical interest within this isolated montane SAC occurs within the north-facing corries on the northern side of the main ridge, mainly where there is some basic influence from the rock. Northern Rock-cress (*Arabidopsis petraea*) grows on one rockface, and occurs elsewhere in Ireland only on Benbulben. A variety of other species indicative of basic or flushed conditions are present on these slopes, including Green Spleenwort (*Asplenium viride*), Mountain Sorrel (*Oxyria digyna*) and Irish saxifrage (*Saxifraga rosacea* subsp. *rosacea*). Stiff Sedge (*Carex bigelowii*) and Dwarf Willow (*Salix herbacea*) are present on the summits in places. Alpine Saw-wort (*Saussurea alpina*) has not been seen on this range since 1945.

English name	Latin name	Date of last record
Northern Rock-cress	*Arabidopsis petraea*	2019
Green Spleenwort	*Asplenium viride*	2019
Stiff Sedge Pyrenean	*Carex bigelowii*	2018
Scurvygrass	*Cochlearia pyrenaica* subsp. *alpina*	2012
Starry Saxifrage	*Micranthes stellaris*	2019
Mountain Sorrel	*Oxyria digyna*	2018
Roseroot	*Rhodiola rosea*	2019
Dwarf Willow	*Salix herbacea*	2018
Alpine Saw-wort	*Saussurea alpina*	1945
Mossy Saxifrage	*Saxifraga hypnoides*	2018
Irish Saxifrage	*Saxifraga rosacea* subsp. *rosacea*	2019
Cowberry	*Vaccinium vitis-idaea*	2018

Glanmore Bog SAC, Co. Cork/Kerry (SAC 001879)

Stiff Sedge (*Carex bigelowii*) and Dwarf Willow (*Salix herbacea*) may occur within this SAC, although the records are poorly localised and may refer to nearby Hungry Hill, which is located outside of the SAC network.

English name	Latin name	Date of last record
Stiff Sedge	*Carex bigelowii*	1996
Dwarf Willow	*Salix herbacea*	1996

Keel Machair/Menaun Cliffs SAC, Co. Mayo (SAC 001513)

The botanical interest at this site occurs in montane heath on the summit of Minaun in the southern part of Achill Island. Dwarf Juniper (*Juniperus communis* subsp. *nana*) and Dwarf Willow (*Salix herbacea*) have been recorded here recently, with Bearberry (*Arctostaphylos uva-ursi*) and Cowberry (*Vaccinium vitis-idaea*) not seen at this location in many decades.

English name	Latin name	Date of last record
Bearberry	*Arctostaphylos uva-ursi*	1949
Dwarf Juniper	*Juniperus communis* subsp. *nana*	2017
Dwarf Willow	*Salix herbacea*	2017
Cowberry	*Vaccinium vitis-idaea*	1904

Kilduff/Devilsbit Mountain SAC, Co. Tipperary (SAC 000934)

Stag's-horn Clubmoss (*Lycopodium clavatum*) was recorded here in 1969, but no subsequent records are known.

English name	Latin name	Date of last record
Stag's-horn Clubmoss	*Lycopodium clavatum*	1969

Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC, Co. Kerry/Cork (SAC 000365)

This large SAC contains numerous mountains and supports many specialist montane species, which are dealt with in more detail in a separate report.

English name	Latin name	Date of last record
Alpine Lady's-mantle	*Alchemilla alpina*	2019
Green Spleenwort	*Asplenium viride*	2021
Stiff Sedge	*Carex bigelowii*	2020
Alpine Hair-grass	*Deschampsia cespitosa* subsp. *alpina*	2019
Alpine Clubmoss	*Diphasiastrum alpinum*	2017
Hoary Whitlowgrass	*Draba incana*	2019
Mountain Male-fern	*Dryopteris oreades*	2019
Stag's-horn Clubmoss	*Lycopodium clavatum*	1901
Starry Saxifrage	*Micranthes stellaris*	2023
Mountain Sorrel	*Oxyria digyna*	2023
Holly-fern	*Polystichum lonchitis*	2020
Roseroot	*Rhodiola rosea*	2023
Dwarf Willow	*Salix herbacea*	2021
Alpine Saw-wort	*Saussurea alpina*	1986
Irish Saxifrage	*Saxifraga rosacea* subsp. *rosacea*	2023
Cowberry	*Vaccinium vitis-idaea*	2009

Knockalongy and Knockachree Cliffs SAC, Co. Sligo (SAC 001669)

The cliffs above Lough Aghree support a handful of specialist montane species, including Yellow Saxifrage (*Saxifraga aizoides*) at an outlying site to the south of its other Irish occurrences.

English name	Latin name	Date of last record
Roseroot	*Rhodiola rosea*	2022
Dwarf Willow	*Salix herbacea*	2011
Yellow Saxifrage	*Saxifraga aizoides*	2022
Cowberry	*Vaccinium vitis-idaea*	1999

Lough Hoe Bog SAC, Co. Mayo/Sligo (SAC 000633)

This upland bog complex to the southwest of the Ox Mountains contains an old record of Stag's-horn Clubmoss (*Lycopodium clavatum*), made in 1901 and not seen since.

English name	Latin name	Date of last record
Stag's-horn Clubmoss	*Lycopodium clavatum*	1901

Lough Nillan Bog (Carrickatleive) SAC, Co. Donegal (SAC 000165)

This area of moderate altitude bog and heath, with some rocky outcrops at the western end of the Bluestacks supports a small number of specialist montane species, namely Alpine Clubmoss (*Diphasiastrum alpinum*), Dwarf Willow (*Salix herbacea*) and Cowberry (*Vaccinium vitis-idaea*).

English name	Latin name	Date of last record
Alpine Clubmoss	*Diphasiastrum alpinum*	2007
Dwarf Willow	*Salix herbacea*	2016
Cowberry	*Vaccinium vitis-idaea*	2007

Maumturk Mountains SAC, Co. Galway (SAC 002008)

Much of the long rugged and rocky ridge of the Maumturks is made up of hard and acidic quartzite, which is generally not hospitable to many specialist montane species. However, the higher ridges support some specialists of that habitat and there are bands of softer, more base-rich rocks in places, which support a number of uncommon calcicoles include Holly-fern (*Polystichum lonchitis*) and Alpine Saw-wort (*Saussurea alpina*).

English name	Latin name	Date of last record
Green Spleenwort	*Asplenium viride*	2011
Stiff Sedge	*Carex bigelowii*	2017
Alpine Clubmoss	*Diphasiastrum alpinum*	2017
Dwarf Juniper	*Juniperus communis* subsp. *nana*	2016
Starry Saxifrage	*Micranthes stellaris*	1999
Holly-fern	*Polystichum lonchitis*	2006
Roseroot	*Rhodiola rosea*	2019
Dwarf Willow	*Salix herbacea*	2019
Alpine Saw-wort	*Saussurea alpina*	2006
Purple Saxifrage	*Saxifraga oppositifolia*	2016
Alpine Meadow-rue	*Thalictrum alpinum*	2014
Cowberry	*Vaccinium vitis-idaea*	1999

Meenaguse Scragh SAC, Co. Donegal (SAC 001880)

This SAC occupies part of centre of the Bluestacks Mountains at moderate to high altitudes and with a variety of habitats and topography. It supports a range of specialist species of montane ridges and summits, including Stiff Sedge (*Carex bigelowii*) and Alpine Clubmoss (*Diphasiastrum alpinum*) as well as some species of base-rich or flushed rockfaces, such as Purple Saxifrage (*Saxifraga oppositifolia*) and Alpine Meadow-rue (*Thalictrum alpinum*). However, the best cliff habitat on these mountains is located outside the SAC on Lavagh More and larger areas of montane heath and associated vegetation occur on summits and ridges, also outside of the SAC boundary.

English name	Latin name	Date of last record
Stiff Sedge	*Carex bigelowii*	2016
Alpine Clubmoss	*Diphasiastrum alpinum*	2016
Stag's-horn Clubmoss	*Lycopodium clavatum*	2016
Starry Saxifrage	*Micranthes stellaris*	2016
Roseroot	*Rhodiola rosea*	2018
Dwarf Willow	*Salix herbacea*	2016
Purple Saxifrage	*Saxifraga oppositifolia*	2001
Alpine Meadow-rue	*Thalictrum alpinum*	2006
Cowberry	*Vaccinium vitis-idaea*	2016

Fig. 5 Alpine Clubmoss (*Diphasiastrum alpinum*)

Mount Brandon SAC, Co. Kerry (SAC 000375)

Mount Brandon is a highly important site for montane flora and has the richest flora of any Irish mountain area, aside from the Ben Bulbin massif. Aside from the typical flora of exposed ridges, Alpine Meadow-grass (*Poa alpina*) and Alpine Bistort (*Bistorta vivipara*) are present on the higher summits, occurring elsewhere in only a small handful of places in Ireland. Extensive cliffs, in many places with basic flushing, support a range of species including Alpine Saw-wort (*Saussurea alpina*) and Holly-fern (*Polystichum lonchitis*), while Mountain Male-fern (*Dryopteris oreades*) and strong populations of Irish saxifrage (*Saxifraga rosacea* subsp. *rosacea*) occur on humid slopes below the cliffs. Alpine Lady's Mantle (*Alchemilla alpina*), an inexplicably rare species in Ireland, is locally frequent in a few places on the mountain. Two species have not been recorded from Brandon, or Kerry, since the 1880s, Alpine Meadow-rue (*Thalictrum alpinum*) and Mossy Saxifrage (*Saxifraga hypnoides*). Cloudberry (*Rubus chamaemorus*) may occur somewhere within this SAC or nearby, with an unconfirmed report from the 1970s, but it requires refinding to verify. At present, in Ireland, this species is only known from the Sperrins in Co. Tyrone.

English name	Latin name	Date of last record
Alpine Lady's-mantle	*Alchemilla alpina*	2019
Green Spleenwort	*Asplenium viride*	2017
Alpine Bistort	*Bistorta vivipara*	2017
Stiff Sedge	*Carex bigelowii*	2017
Pyrenean Scurvygrass	*Cochlearia pyrenaica* subsp. *alpina*	1999
Alpine Hair-grass	*Deschampsia cespitosa* subsp. *alpina*	2011
Alpine Clubmoss	*Diphasiastrum alpinum*	1969
Mountain Male-fern	*Dryopteris oreades*	2019
Dwarf Juniper	*Juniperus communis* subsp. *nana*	1969
Starry Saxifrage	*Micranthes stellaris*	2021
Mountain Sorrel	*Oxyria digyna*	2019
Alpine Meadow-grass	*Poa alpina*	2012
Holly-fern	*Polystichum lonchitis*	2019
Roseroot	*Rhodiola rosea*	2019
Dwarf Willow	*Salix herbacea*	2017
Alpine Saw-wort	*Saussurea alpina*	2019
Mossy Saxifrage	*Saxifraga hypnoides*	1885
Irish Saxifrage	*Saxifraga rosacea* subsp. *rosacea*	2019
Alpine Meadow-rue	*Thalictrum alpinum*	1887

Muckish Mountain SAC, Co. Donegal (SAC 001179)

This large whaleback mountain supports a range of montane species and has an extensive exposed summit plateau covered with montane vegetation where much Stiff Sedge (*Carex bigelowii*) and Dwarf Willow (*Salix herbacea*) grow. There are cliffs at various areas of its flanks, with intrusions of basic rock, which support rare calcicole species including Holly-fern (*Polystichum lonchitis*) and Alpine Saw-wort (*Saussurea alpina*). The rare hybrid between Holly-fern (*Polystichum lonchitis*) and Hard Shield-fern (*Polystichum aculeatum*) is present in one location,

English name	Latin name	Date of last record
Green Spleenwort	*Asplenium viride*	1998
Stiff Sedge	*Carex bigelowii*	2022
Dwarf Juniper	*Juniperus communis* subsp. *nana*	2022
Starry Saxifrage	*Micranthes stellaris*	2005
Holly-fern	*Polystichum lonchitis*	2018
Roseroot	*Rhodiola rosea*	2005
Dwarf Willow	*Salix herbacea*	2022
Alpine Saw-wort	*Saussurea alpina*	2005
Cowberry	*Vaccinium vitis-idaea*	2022

Fig, 6 Exposed summit vegetation, Muckish Mountain SAC

Mweelrea/Sheefry/Erriff Complex SAC, Co. Mayo (SAC 001932)

This large upland SAC consists of three mountain massifs, all of which contain much habitat for montane species, with large rocky corries and exposed mountain ridges throughout. The summit ridges support the typical array of characteristic species, including Stiff Sedge (*Carex bigelowii*), Alpine Clubmoss (*Diphasiastrum alpinum*) and Dwarf Willow (*Salix herbacea*). A range of species have been found on the cliffs, indicative of both basic and acidic conditions, including Alpine Hair-grass (*Deschampsia cespitosa* subsp. *alpina*), Mountain Male-fern (*Dryopteris oreades*), Alpine Saw-wort (*Saussurea alpina*) and Alpine Meadow-rue. Holly-fern (*Polystichum lonchitis*) has not been recorded since 1996, while Tea-leaved Willow (*Salix phylicifolia*) was recorded once in this SAC in 1953, being known elsewhere in Ireland only from the limestone uplands of Sligo and Leitrim.

English name	Latin name	Date of last record
Bearberry	*Arctostaphylos uva-ursi*	2024
Green Spleenwort	*Asplenium viride*	2015
Stiff Sedge	*Carex bigelowii*	2018
Alpine Hair-grass	*Deschampsia cespitosa* subsp. *alpina*	2015
Alpine Clubmoss	*Diphasiastrum alpinum*	2024
Mountain Male-fern	*Dryopteris oreades*	2012
Dwarf Juniper	*Juniperus communis* subsp. *nana*	2024
Stag's-horn Clubmoss	*Lycopodium clavatum*	1993
Starry Saxifrage	*Micranthes stellaris*	2018
Mountain Sorrel	*Oxyria digyna*	2015
Holly-fern	*Polystichum lonchitis*	1996
Roseroot	*Rhodiola rosea*	2018
Dwarf Willow	*Salix herbacea*	2018
Tea-leaved Willow	*Salix phylicifolia*	1953
Alpine Saw-wort	*Saussurea alpina*	2018
Purple Saxifrage	*Saxifraga oppositifolia*	2010
Alpine Meadow-rue	*Thalictrum alpinum*	2018
Cowberry	*Vaccinium vitis-idaea*	1999

North Inishowen Coast SAC, Co. Donegal (SAC 002012)

This SAC cannot be considered montane, as it reaches a maximum altitude of less than 250m. However, the exposed north-facing cliffs of Dunaff Head and Glengad support a number of specialist montane species on outcropping calcareous rocks, including Holly-fern (*Polystichum lonchitis*), Purple Saxifrage (*Saxifraga oppositifolia*) and Moss Campion (*Silene acaulis*).

English name	Latin name	Date of last record
Dwarf Juniper	*Juniperus communis* subsp. *nana*	2018
Holly-fern	*Polystichum lonchitis*	1998
Roseroot	*Rhodiola rosea*	2018
Purple Saxifrage	*Saxifraga oppositifolia*	2015
Moss Campion	*Silene acaulis*	2018

Owneduff-Nephin Complex SAC, Co. Mayo (SAC 000534)

The spine of this SAC consists of the Nephin Beg Mountains, which contain a number of high exposed ridges and rocky corries. Where there is basic influence on the cliffs of the corries, uncommon species present include Alpine Saw-wort (*Saussurea alpina*) and Purple Saxifrage (*Saxifraga oppositifolia*). Stiff Sedge (*Carex bigelowii*) and Dwarf Willow (*Salix herbacea*) have been recorded from the summit ridges, although the latest record for the latter comes from 1882.

English name	Latin name	Date of last record
Bearberry	*Arctostaphylos uva-ursi*	1882
Stiff Sedge	*Carex bigelowii*	2024
Pyrenean Scurvygrass	Cochlearia pyrenaica subsp. alpina	1999
Starry Saxifrage	*Micranthes stellaris*	2015
Mountain Sorrel	*Oxyria digyna*	2015
Roseroot	*Rhodiola rosea*	2015
Dwarf Willow	*Salix herbacea*	1882
Alpine Saw-wort	*Saussurea alpina*	2015
Purple Saxifrage	*Saxifraga oppositifolia*	2015

Ox Mountains Bogs SAC, Co. Sligo/Mayo (SAC 002006)

Most of this upland area is rolling bog, which limits the available habitat for specialist montane species. However, small areas of rocky outcrops support Green Spleenwort (*Asplenium viride*) and Roseroot (*Rhodiola rosea*), while Stiff Sedge (*Carex bigelowii*), Dwarf Willow (*Salix herbacea*) and Cowberry (*Vaccinium vitis-idaea*) grow on the higher parts of the site.

English name	Latin name	Date of last record
Green Spleenwort	*Asplenium viride*	2012
Stiff Sedge	*Carex bigelowii*	2012
Roseroot	*Rhodiola rosea*	2017
Dwarf Willow	*Salix herbacea*	2005
Cowberry	*Vaccinium vitis-idaea*	2012

River Finn SAC, Co. Donegal (SAC 002301)

This SAC is mainly lowland, consisting of the River Finn and its tributaries, but includes some upland areas in its upper reaches. Holly-fern (*Polystichum lonchitis*) is found on steep slopes above Lough Finn, while Alpine Clubmoss (*Diphasiastrum alpinum*), Stag's-horn Clubmoss (*Lycopodium clavatum*) and Cowberry (*Vaccinium vitis-idaea*) have been recorded where part of the eastern Bluestacks Mountains have been included within the SAC boundary.

English name	Latin name	Date of last record
Alpine Clubmoss	*Diphasiastrum alpinum*	1894
Stag's-horn Clubmoss	*Lycopodium clavatum*	2004
Holly-fern	*Polystichum lonchitis*	2016
Cowberry	*Vaccinium vitis-idaea*	2021

Slieve Fyagh Bog SAC, Co. Mayo (SAC 000542)

An imprecisely located record of Stag's-horn Clubmoss (*Lycopodium clavatum*) from 1999 may have come from this rounded boggy peak close to the North Mayo coast.

English name	Latin name	Date of last record
Stag's-horn Clubmoss	*Lycopodium clavatum*	1999

Slieve League SAC, Co. Donegal (SAC 000189)

A wide variety of specialist montane species grow on this upland SAC beside the coast, both on the summit and on base-rich cliffs on the northern slopes. Montane heath above the cliffs contains Stiff Sedge (*Carex bigelowii*), Dwarf Willow (*Salix herbacea*), Alpine Clubmoss (*Diphasiastrum alpinum*), Dwarf Juniper (*Juniperus communis* subsp. *nana*), Cowberry (*Vaccinium vitis-idaea*) and Bearberry (*Arctostaphylos uva-ursi*). Amongst a variety of species occurring on the north-facing cliffs, rarer species include Alpine Bistort (*Bistorta vivipara*) and an outlying population of Yellow Saxifrage (*Saxifraga aizoides*). Holly-fern (*Polystichum lonchitis*) has not been seen here since 1989 and Mountain Male-fern (*Dryopteris oreades*) was last recorded in 1898.

English name	Latin name	Date of last record
Bearberry	*Arctostaphylos uva-ursi*	2016
Green Spleenwort	*Asplenium viride*	2024
Alpine Bistort	*Bistorta vivipara*	2006
Stiff Sedge	*Carex bigelowii*	2012
Alpine Clubmoss	*Diphasiastrum alpinum*	2009
Mountain Avens	*Dryas octopetala*	2006
Mountain Male-fern	*Dryopteris oreades*	1898
Dwarf Juniper	*Juniperus communis* subsp. *nana*	2016
Starry Saxifrage	*Micranthes stellaris*	2024
Mountain Sorrel	*Oxyria digyna*	2024
Holly-fern	*Polystichum lonchitis*	1989
Roseroot	*Rhodiola rosea*	2024
Dwarf Willow	*Salix herbacea*	2016
Alpine Saw-wort	*Saussurea alpina*	2006
Yellow Saxifrage	*Saxifraga aizoides*	2024
Purple Saxifrage	*Saxifraga oppositifolia*	2012
Alpine Meadow-rue	*Thalictrum alpinum*	2024
Cowberry	*Vaccinium vitis-idaea*	2016

Slieve Mish Mountains SAC, Co. Kerry (SAC 002185)

Extensive areas of montane vegetation cover the higher parts of this SAC, with a range of characteristic species present including Stiff Sedge (*Carex bigelowii*), Alpine Clubmoss (*Diphasiastrum alpinum*) and Dwarf Willow (*Salix herbacea*), as well as a single occurrence of the rare Alpine Meadow-grass (*Poa alpina*). The north-facing cliffs above a number of long, deep valleys support montane species such as Irish saxifrage (*Saxifraga rosacea* subsp. *rosacea*), although Pyrenean Scurvygrass (, Alpine Hair-grass (*Deschampsia cespitosa* subsp. *alpina*) and Mountain Sorrel (*Oxyria digyna*) have not been recorded from this SAC since prior to 1969.

English name	Latin name	Date of last record
Stiff Sedge	*Carex bigelowii*	2014
Pyrenean Scurvygrass	*Cochlearia pyrenaica* subsp. *alpina*	1969
Alpine Hair-grass	*Deschampsia cespitosa* subsp. *alpina*	1969
Alpine Clubmoss	*Diphasiastrum alpinum*	2014
Starry Saxifrage	*Micranthes stellaris*	2017
Mountain Sorrel	*Oxyria digyna*	1969
Alpine Meadow-grass	*Poa alpina*	2009
Roseroot	*Rhodiola rosea*	2017
Dwarf Willow	*Salix herbacea*	2014
Irish Saxifrage	*Saxifraga rosacea* subsp. *rosacea*	2017

Slieve Tooey/Tormore Island/Loughros Beg Bay SAC, Co. Donegal (SAC 000190)

The primary habitat for specialist montane species within this coastal SAC is extensive montane heath above tall sea cliffs on the summit plateau of Slieve Tooey, which supports Bearberry (*Arctostaphylos uva-ursi*), Stiff Sedge (*Carex bigelowii*), Dwarf Juniper (*Juniperus communis* subsp. *nana*) and Dwarf Willow (*Salix herbacea*). Cliffs here support some calcicole species, including Green Spleenwort (*Asplenium viride*) and Purple Saxifrage (*Saxifraga oppositifolia*).

English name	Latin name	Date of last record
Bearberry	*Arctostaphylos uva-ursi*	2017
Green Spleenwort	*Asplenium viride*	1999
Stiff Sedge	*Carex bigelowii*	2017
Dwarf Juniper	*Juniperus communis* subsp.	2017
Starry Saxifrage	*Micranthes stellaris*	2015
Roseroot	*Rhodiola rosea*	2023
Dwarf Willow	*Salix herbacea*	2017
Purple Saxifrage	*Saxifraga oppositifolia*	2018

The Twelve Bens/Garraun Complex SAC, Co. Galway (SAC 002031)

The ridges and rocky slopes of this extensive mountain area support a variety of specialist montane species. The characteristic array of montane species of summits and ridges is recorded, with species present including Stiff Sedge (*Carex bigelowii*) and Dwarf Willow (*Salix herbacea*). Calcareous rock outcrops in places, allowing a variety of species to grow, including Green Spleenwort (*Asplenium viride*), Holly-fern (*Polystichum lonchitis*) and Alpine Saw-wort (*Saussurea alpina*). Alpine Clubmoss (*Diphasiastrum alpinum*) and Alpine Saw-wort (*Saussurea alpina*) have not been recorded from this range since before 1999, with Parsley Fern (*Cryptogramma crispa*) last seen here in 1986.

English name	Latin name	Date of last record
Bearberry	*Arctostaphylos uva-ursi*	2018
Green Spleenwort	*Asplenium viride*	2016
Stiff Sedge	*Carex bigelowii*	2021
Parsley Fern	*Cryptogramma crispa*	1986
Alpine Clubmoss	*Diphasiastrum alpinum*	1999
Dwarf Juniper	*Juniperus communis* subsp. *nana*	2019
Starry Saxifrage	*Micranthes stellaris*	2018
Mountain Sorrel	*Oxyria digyna*	2016
Holly-fern	*Polystichum lonchitis*	2006
Roseroot	*Rhodiola rosea*	2021
Dwarf Willow	*Salix herbacea*	2021
Alpine Saw-wort	*Saussurea alpina*	2006
Purple Saxifrage	*Saxifraga oppositifolia*	2018
Irish Saxifrage	*Saxifraga rosacea* subsp. *rosacea*	1999
Alpine Meadow-rue	*Thalictrum alpinum*	2021
Cowberry	*Vaccinium vitis-idaea*	1999

Tully Mountain SAC, Co. Galway (SAC 000330)

This isolated coastal hill is relatively low in altitude and is made up of hard quartzite, so does not support a rich montane flora. However, Bearberry (*Arctostaphylos uva-ursi*) and Dwarf Juniper (*Juniperus communis* subsp. *nana*) grow in exposed heath on the summit ridge.

English name	Latin name	Date of last record
Bearberry	*Arctostaphylos uva-ursi*	2018
Dwarf Juniper	*Juniperus communis* subsp. *nana*	2017

Wicklow Mountains SAC, Co. Wicklow/Dublin (SAC 002122)

A range of montane species occur on the ridges and corries of this SAC, which are described in more detail in a separate report.

English name	Latin name	Date of last record
Alpine Lady's-mantle	*Alchemilla alpina*	2022
Stiff Sedge	*Carex bigelowii*	2022
Parsley Fern	*Cryptogramma crispa*	1938
Alpine Clubmoss	*Diphasiastrum alpinum*	2021
Stag's-horn Clubmoss	*Lycopodium clavatum*	2021
Starry Saxifrage	*Micranthes stellaris*	2019
Roseroot	*Rhodiola rosea*	1929
Dwarf Willow	*Salix herbacea*	2021
Alpine Saw-wort	*Saussurea alpina*	2022
Mossy Saxifrage	*Saxifraga hypnoides*	1927
Cowberry	*Vaccinium vitis-idaea*	2021

Fig. 7 Cowberry (*Vaccinium vitis-idaea*)

Important areas for montane plants outside of the SAC network

Ulster

Donegal contains a number of sites rich in montane specialists not currently within the protected area network. The richest of these, and the richest unprotected site in Ireland, is Bulbin on the Inishowen Peninsula. Although of relatively low altitude, with the summit just short of 500m, the strongly calcareous schistose rocks which outcrop on its northern side support a rich montane flora. The most notable of these species is Alpine Bistort (, alongside other uncommon calcicoles including Holly-fern (*Polystichum lonchitis*) and Alpine Saw-wort (*Saussurea alpina*). In the south of the county, Alt Mountain was first explored by H.C. Hart in the 1860s, where he found Parsley Fern (*Cryptogramma crispa*), Alpine Saw-wort (*Saussurea alpina*) and Yellow Saxifrage (*Saxifraga aizoides*), among other species, with but the Parsley Fern (*Cryptogramma crispa*) recently rediscovered. A number of SACs occur within the Bluestack Mountains, but none of them include the richest area for montane plants, which is around the higher peaks of Croaghgorm and Lavagh Mor. Outcropping of basic rocks occurs on the northern slopes, with species present including Alpine Saw-wort (*Saussurea alpina*) and Alpine meadow-rue (*Thalictrum alpinum*), while the exposed summits support montane vegetation with Alpine Clubmoss (*Diphasiastrum alpinum*), Stiff Sedge (*Carex bigelowii*) and Dwarf Willow (*Salix herbacea*).

Bulbin Mountain, Co. Donegal (C34)

English name	Latin name	Year of last record
Green Spleenwort	*Asplenium viride*	2016
Alpine Bistort	*Bistorta vivipara*	2018
Stiff Sedge	*Carex bigelowii*	2018
Hoary Whitlowgrass	*Draba incana*	1998
Starry Saxifrage	*Micranthes stellaris*	2011
Holly-fern	*Polystichum lonchitis*	2016
Roseroot	*Rhodiola rosea*	2018
Dwarf Willow	*Salix herbacea*	2018
Alpine Saw-wort	*Saussurea alpina*	2018
Purple Saxifrage	*Saxifraga oppositifolia*	2018
Cowberry	*Vaccinium vitis-idaea*	2018

Lough Salt, Co. Donegal (C12)

English name	Latin name	Year of last record
Bearberry	*Arctostaphylos uva-ursi*	2015
Dwarf Willow	*Salix herbacea*	2015

Mulnanaff and Alt/Common Mountain, Co. Donegal (G68/G78)

English name	Latin name	Year of last record
Parsley Fern	*Cryptogramma crispa*	1866
Starry Saxifrage	*Micranthes stellaris*	2023
Roseroot	*Rhodiola rosea*	2023
Dwarf Willow	*Salix herbacea*	2004
Alpine Saw-wort	*Saussurea alpina*	2023
Yellow Saxifrage	*Saxifraga aizoides*	2023
Alpine Meadow-rue	*Thalictrum alpinum*	2023

Lavagh Mor and Croaghgorm, Co. Donegal (G98/G99)

English name	Latin name	Year of last record
Green Spleenwort	*Asplenium viride*	2007
Stiff Sedge	*Carex bigelowii*	2006
Alpine Clubmoss	*Diphasiastrum alpinum*	2018
Stag's-horn Clubmoss	*Lycopodium clavatum*	1998
Starry Saxifrage	*Micranthes stellaris*	2006
Roseroot	*Rhodiola rosea*	1988
Dwarf Willow	*Salix herbacea*	2018
Alpine Saw-wort	*Saussurea alpina*	2006
Alpine Meadow-rue	*Thalictrum alpinum*	2006
Cowberry	*Vaccinium vitis-idaea*	2006

Connacht

Sites containing specialist montane species, outside of the SAC network, are scattered throughout Connacht, with the greatest concentration in Co. Mayo. The second highest peak in Connacht, Nephin, and neighbouring Birreencorragh, support a range of montane species, the most uncommon of these being Alpine Clubmoss (*Diphasiastrum alpinum*). The steep northern slopes of Croagh Patrick show evidence of some base-rich rocks, with Green Spleenwort (*Asplenium viride*) and Mountain Sorrel (*Oxyria digyna*) recorded relatively recently, and Alpine Saw-wort (*Saussurea alpina*) last recorded in 1883. The extensive broad and exposed plateau of Maumtrasna, much of which is above 600m altitude, provides important habitat for specialist montane species including Alpine Clubmoss (*Diphasiastrum alpinum*), Dwarf Willow (*Salix herbacea*) and Stiff Sedge (*Carex bigelowii*), while cliffs on its steep flanks and on nearby Benbeg host species including Green Spleenwort (*Asplenium viride*), Alpine Hair-grass (*Deschampsia cespitosa* subsp. *alpina*), Alpine Meadow-rue (*Thalictrum alpinum*) and Holly-fern (*Polystichum lonchitis*). The cliffs of Lissoughter, in Co. Galway, are located just outside of the boundary of the Maumturk Mountains SAC, but is a very important site for montane species, representing the only site in Connemara for Mountain Avens (*Dryas octopetala*), alongside a strong population of Purple Saxifrage (*Saxifraga oppositifolia*) and Green Spleenwort (*Asplenium viride*). The Castlegal range near Sligo Town represents an outlier, both geographically and botanically, of the Benbulben range to the north. It does not support as rich a flora as that range, but does host handful of specialised montane species, including Green Spleenwort (*Asplenium viride*) and Yellow Saxifrage (*Saxifraga aizoides*). Moss Campion (*Silene acaulis*) was recorded here in 1896, but has not been seen since.

Castlegal Range, Co. Sligo/Leitrim (G73/G74/G83)

English name	Latin name	Year of last record
Green Spleenwort	*Asplenium viride*	2021
Hoary Whitlowgrass	*Draba incana*	1993
Roseroot	*Rhodiola rosea*	2007
Yellow Saxifrage	*Saxifraga aizoides*	2019
Mossy Saxifrage	*Saxifraga hypnoides*	2019
Moss Campion	*Silene acaulis*	1896

Knocknarea, Co. Sligo (G63)

English name	Latin name	Year of last record
Green Spleenwort	*Asplenium viride*	2020
Hoary Whitlowgrass	*Draba incana*	2011
Cowberry	*Vaccinium vitis-idaea*	2013

Carrane Hill and Seltanasaggart, Co. Leitrim/Roscommon (G82/G92)

English name	Latin name	Year of last record
Green Spleenwort	*Asplenium viride*	2022
Hoary Whitlowgrass	*Draba incana*	2022
Stag's-horn Clubmoss	*Lycopodium clavatum*	2024
Mossy Saxifrage	*Saxifraga hypnoides*	2022
Cowberry	*Vaccinium vitis-idaea*	2016

Birreencorragh, Co. Mayo (G00)

English name	Latin name	Year of last record
Starry Saxifrage	*Micranthes stellaris*	2017
Roseroot	*Rhodiola rosea*	2017
Dwarf Willow	*Salix herbacea*	2017
Cowberry	*Vaccinium vitis-idaea*	2017

Nephin, Co. Mayo (G00/G10)

English name	Latin name	Year of last record
Bearberry	*Arctostaphylos uva-ursi*	2018
Stiff Sedge	*Carex bigelowii*	2023
Alpine Clubmoss	*Diphasiastrum alpinum*	2010
Dwarf Willow	*Salix herbacea*	2023
Cowberry	*Vaccinium vitis-idaea*	2016

Croagh Patrick, Co. Mayo (L88/L98)

English name	Latin name	Year of last record
Green Spleenwort	*Asplenium viride*	2003
Stiff Sedge	*Carex bigelowii*	2008
Mountain Sorrel	*Oxyria digyna*	2003
Roseroot	*Rhodiola rosea*	2003
Alpine Saw-wort	*Saussurea alpina*	1883

Maumtrasna, Co. Mayo/Galway (L96)

English name	Latin name	Year of last record
Green Spleenwort	*Asplenium viride*	2016
Stiff Sedge	*Carex bigelowii*	2022
Alpine Hair-grass	*Deschampsia cespitosa* subsp. *alpina*	2012
Alpine Clubmoss	*Diphasiastrum alpinum*	2022
Dwarf Juniper	*Juniperus communis* subsp. *nana*	2022
Starry Saxifrage	*Micranthes stellaris*	2019
Roseroot	*Rhodiola rosea*	2019
Dwarf Willow	*Salix herbacea*	2022
Alpine Meadow-rue	*Thalictrum alpinum*	2015

Benbeg, Co. Galway (L95)

English name	Latin name	Year of last record
Holly-fern	*Polystichum lonchitis*	1996
Alpine Meadow-rue	*Thalictrum alpinum*	1985
Cowberry	*Vaccinium vitis-idaea*	1985

Lissoughter, Co. Galway (L84)

English name		Year of last record
Green Spleenwort	*Asplenium viride*	2022
Mountain Avens	*Dryas octopetala*	2022
Purple Saxifrage	*Saxifraga oppositifolia*	2022

Munster

Within Munster, the majority of important mountain areas are already located within the boundaries of SACs. The most significant mountain that is not designated an SAC is the Knockmealdown Mountains on the Tipperary/Waterford border. The only montane specialist recorded here since the year 2000 is Stiff Sedge (*Carex bigelowii*), but a number of other uncommon montane species have been recorded on the range in the past, including Alpine Hair-grass (*Deschampsia cespitosa* subsp. *alpina*) and Dwarf Willow (*Salix herbacea*). Most of these species have not been seen here since before 1900. A notable rare species recently discovered in a flush on the flanks of the Knockmealdowns is Marsh Clubmoss (*Lycopodiella inundata*). The majority of the Galtee Mountains are located within the namesake SAC, with the exception of Temple Hill at the western end, which supports a handful of montane species on its summit and on base-rich crags on its flanks. Most major mountain areas in the southwest of Ireland are included within SACs, the exception being Hungry Hill on the Beara Peninsula, where the cliffs support Starry Saxifrage (*Micranthes stellaris*) and Roseroot (*Rhodiola rosea*), while Dwarf Willow (*Salix herbacea*) grows on the summit.

Tountinna, Co. Tipperary (R77)

English name	Latin name	Year of last record
Stag's-horn Clubmoss	*Lycopodium clavatum*	2018

Slievenamon, Co. Tipperary (S23)

English name	Latin name	Year of last record
Stiff Sedge	*Carex bigelowii*	2019

Knockmealdown Mountains, Co. Tipperary/Waterford (R90/S00)

English name	Latin name	Year of last record
Green Spleenwort	*Asplenium viride*	1894
Stiff Sedge	*Carex bigelowii*	2004
Alpine Hair-grass	*Deschampsia cespitosa* subsp. *alpina*	1969
Stag's-horn Clubmoss	*Lycopodium clavatum*	1986
Dwarf Willow	*Salix herbacea*	1882
Mossy Saxifrage	*Saxifraga hypnoides*	1883

Temple Hill, Co. Limerick (R82)

English name	Latin name	Year of last record
Stiff Sedge	*Carex bigelowii*	2022
Dwarf Willow	*Salix herbacea*	2022
Cowberry	*Vaccinium vitis-idaea*	2010

Hungry Hill, Co. Cork/Kerry (V74)

English name	Latin name	Year of last record
Starry Saxifrage	*Micranthes stellaris*	2019
Roseroot	*Rhodiola rosea*	2019
Dwarf Willow	*Salix herbacea*	2019

Leinster

Most botanical interest in Leinster is located within the Wicklow Mountains, Blackstairs and Carlingford Mountain SACs. Limited montane species are found on outlying peaks of the Wicklow Mountains, with Stiff Sedge (*Carex bigelowii*) occurring on Croghan Kinsella and Starry Saxifrage (*Micranthes stellaris*) and Cowberry (*Vaccinium vitis-idaea*) recorded in the early part of the 20th Century on Keadeen Mountain. Stag's-horn Clubmoss (*Lycopodium clavatum*) was recently rediscovered on the high point of Co. Kilkenny, Brandon Hill.

Brandon Hill, Co. Kilkenny (S64)

English name	Latin name	Year of last record
Stag's-horn Clubmoss	*Lycopodium clavatum*	2024

Croaghan Kinsella, Co. Wicklow/Wexford (T17)

English name	Latin name	Year of last record
Stiff Sedge	*Carex bigelowii*	2023

Keadeen Mountain, Co. Wicklow (S99)		
English name	**Latin name**	**Year of last record**
Starry Saxifrage	*Micranthes stellaris*	1931
Cowberry	*Vaccinium vitis-idaea*	1927

Fig. 8 Alpine Saw-wort (*Saussurea alpina*) and Alpine Lady's-mantle (*Alchemilla alpina*)

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