



# National Plant Monitoring Scheme

## Online Training Materials 11: Introduction to Marsh and Fen



UK Centre for  
Ecology & Hydrology



Botanical Society  
of Britain & Ireland



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# National Plant Monitoring Scheme

An introduction to UK National Plant Monitoring Scheme broad habitat type

## MARSH AND FEN



Produced by Ben Averis for the NPMS in July 2020



The NPMS Marsh and Fen broad habitat covers a wide range of wetlands with varied mixtures of sedges, rushes, grasses, herbs and mosses. It takes in most non-coastal wetland that is not bog, wet heath (=NPMS 'bog and wet heath'), reedbed or vegetation fringing open water (=NPMS 'freshwater'). It includes springs and other wetlands that are often referred to as flush, fen or mire. Definitions of flush, fen and mire can be confusing because some plant communities straddle two or more of those categories, but running through the whole Marsh and Fen broad habitat is a gradient of variation in species composition related to soil acidity, so we can place most examples of Marsh and Fen into one of three groups: **acid**, **neutral** and **basic** (photos + NPMS fine-scale habitat correspondences below).

### ACID

with *Sphagnum* and/or *Polytrichum commune* mosses



ACID fen / flush / mire / spring FINE-SCALE NPMS HABITAT

### NEUTRAL

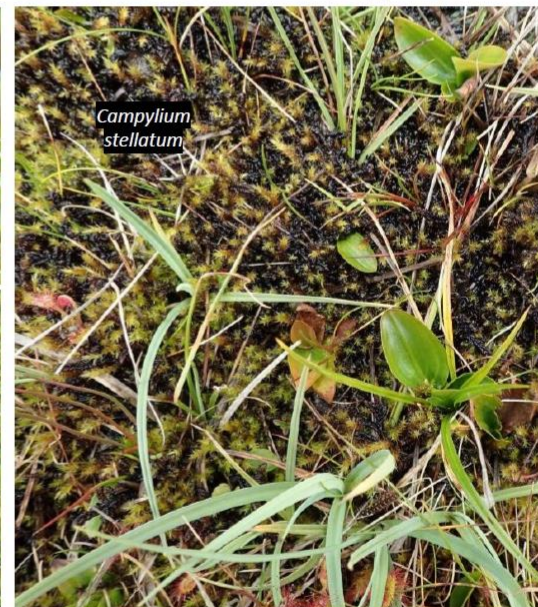
with mesotrophic herbs + *Calliergonella* moss



BASE-RICH fen / flush / mire / spring FINE-SCALE NPMS HABITAT

### BASIC

with 'brown mosses' such as *Campyllum stellatum*



Note: in this document, flowering periods of plant species are given numerically (e.g. 5-6 = May-June); this information is taken from Collins Flower Guide ISBN 978-0-00-718389-0



These five **sedges** are common in the marsh and fen NPMS habitat:



Fl 5-7 (fruits 6-8)

**Common sedge *Carex nigra*.** Leaves mid grey-green, 1-3 mm wide and growing up (not widely spreading). In a wide range of habitats on damp/wet acid to neutral soils.



Fl 5-6 (fruits 6-7)

**Carnation sedge *Carex panicea*.** Leaves pale grey-green on both sides, 2-5 mm wide, spreading out widely. One male spike at top of stem. In a wide range of mires, wet heaths and damp grasslands on acid to quite basic soils.



Fl 5-6 (fruits 7-8)

**Glaucous sedge *Carex flacca*.** Leaves mid green on upper side and paler greyish green below. 2-3 mm wide and widely spreading. 2-3 male spikes at top of stem. On dryish to quite wet neutral to basic soils.



Fl 7-8 (fruits 7-8)

**Bottle sedge *Carex rostrata*.** Leaves 2-7 mm wide; grey-green on upper side; darker shiny green below; not widely spreading. Can form lush swards. Large female spikes. In acid, neutral and basic wetlands. NPMS positive indicator in both fine-scale habitats of marsh/fen broad habitat.



Fl 6-7 (fruits 6-7)

**Star sedge *Carex echinata*.** Leaves 1-2.5 mm wide, mid green. Flowers/fruits in distinctive star-like groups at the tips of the stems and accompanied by only a very short, inconspicuous narrow leafy bract. Mainly in acid sedge and rush mires but also in some neutral mires.



These **sideways-flowering rushes** (tufted, with flowers in small cluster on side of stem) grow in marsh/fen habitat:



Soft rush *Juncus effusus*



Soft rush *Juncus effusus* (fl 6-8)



Compact rush  
*J. conglomeratus*  
(fl 6-8)



Hard rush *J. inflexus* (fl 6-8)

**Soft rush *Juncus effusus*.** Stems green and smooth. On damp to wet acid to neutral soils. **Compact rush *J. conglomeratus*.** Stems green, with parallel ridges/grooves running their length; flower head dark and compact; on damp to wet acid to neutral soils. **Hard rush *J. inflexus*.** Stems grey-green, narrow and ridged; flower head more open; on damp to wet neutral to basic soils. All spp. listed as NPMS negative indicators in marsh/fen habitat.



And these **top-flowering rushes** (not tufted; flowers in branched clusters at stem tips) are common in marsh/fen too:



**Sharp-flowered rush *Juncus acutiflorus*** (L): leaves have transverse internal walls (see middle photo); on acid to neutral soils. **Blunt-flowered rush *J. subnodulosus*** (R): leaves have transverse walls as in *J. acutiflorus* but also longitudinal walls, and flower head has branches sticking out at a wider angle; on neutral to basic soils. **Jointed rush *J. articulatus*** = like *J. acutiflorus* but shorter and tufted, with leaves and stems curved out from plant base and then upwards; leaves flattened in section; on damp to wet neutral to basic soils; does not form such tall, dense or and extensive swards.



The most consistent differences between acid, neutral and basic forms of marsh/fen are in the lower layers of the vegetation, including mosses. Taller vascular species can give clues too, but many of them are equally common in at least two of the acid, neutral and basic forms of marsh/fen.

In the NPMS classification scheme the Marsh and Fen broad habitat is divided into **acid** and **base-rich** fine-scale habitats. **Neutral** gets lumped in with base-rich, so we have:

- **Acidic fens, flushes, mires and springs fine-scale NPMS habitat = on acid soils**
- **Base-rich fens, flushes, mires and springs fine-scale NPMS habitat = on neutral or base-rich soils**

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Let's start with the **acidic** fine-scale NPMS habitat. Remember that this does not include bogs and wet heaths (where we find species such as heather, cross-leaved heath, deergrass, hare's-tail cottongrass and the mosses *Sphagnum papillosum*, *S. medium* and *S. divinum*); they are also on acid soils but are in the Bog and Wet heath NPMS broad habitat. So, here in the acidic fine-scale habitat of Marsh and Fen are such things as springs, flushes and basin mires whose vegetation varies from moss/liverwort-dominated to mixtures of mosses, sedges and rushes. Herbs are mostly sparse, low-grown and not very conspicuous.



Moss-dominated acid spring (Lake District)



Acidic sedge mire: sedges growing through an extensive *Sphagnum* moss layer (Sutherland)



## ACIDIC FENS, FLUSHES, MIRES AND SPRINGS FINE-SCALE NPMS HABITAT

A varied mix of plant communities united by a floristic element indicative of acid soils and typically including one or more of these mosses (especially *Sphagnum* and *Polytrichum commune*, which are particularly common and conspicuous here).



*Sphagnum* species (this one is *S. fallax*)



*Polytrichum commune* – has leaves like miniature conifer needles!



*Aulacomnium palustre*



*Philonotis fontana*





**Herbs** are generally not very conspicuous or lush in these acid mires, but these species can be found here:



**Marsh violet *Viola palustris*** (leaf + flower). Leaf more rounded and rather paler green, and flowers paler, than in common dog-violet.



Fl 4-7



Fl 6-9

**Tormentil *Potentilla erecta***. Leaf with 3 toothed leaflets + 2 stipules; yellow flower with 4 petals.



Fl 6-8

**Heath bedstraw *Galium saxatile***. Small leaves in whorls of 4-8. Small white 4-petalled flowers.



Fl 5-9

**Lesser spearwort *Ranunculus flammula***. Like a buttercup but leaves narrow oval and hairless.

Marsh violet and tormentil are listed as positive indicators in the base-rich fine-scale NPMS habitat of Marsh & Fen, but they are at least as much plants of acid mires and could perhaps be expected to be listed for the acid fine-scale NPMS habitat instead.



In the uppermost parts of wetland systems are springs from which water emerges typically (but not in all cases) from a ground/bedrock aquifer. These springs are generally mossy. Here is an **acidic spring** in Galloway in September.





**Acid springs** in the hills can also have patches of liverworts among the mosses. *Scapania undulata* is one of the commonest liverworts in such places, and it can be green, brown or purplish. This photo of *S. undulata* was taken by my wife Alison in Glen Coe. It was actually a photo of the very rare *Saxifraga rivularis* on a wet rocky bank high in the mountains, but it happened to have the *Scapania* in it too (and I happened not to have taken a photo of this liverwort myself), so I cropped it and enlarged it to show the *Scapania* better (arrowed). I've also made sure to show part of the rare saxifrage, because I thought you might be interested.





This **acidic mountain spring**, in Sutherland in May, has a very different liverwort in it: *Anthelia julacea*. Indeed, the vegetation here is made up mainly of low, silvery to dark grey carpets of the massed tiny shoots of this species.





**Flushes** run down from the springs, and in acidic flushes we commonly see sedges such as **common sedge** *Carex nigra* and **star sedge** *C. echinata* among the carpets of *Sphagnum* and *Polytrichum* mosses. This **acidic flush** is in Sutherland and was photographed in September.





This **acidic flush mire** in Stirlingshire in June is similar, with abundant *Sphagnum*, but the sedge is **bottle sedge** *Carex rostrata*. There is also a lot of common cottongrass *Eriophorum angustifolium*, with white cottony heads.





Another **acidic bottle sedge mire** in Stirlingshire, in April, on slightly flushed ground and surrounded by heath and bog.





This **acidic rushy flush**, in Northern Ireland in September, has rather similar carpets of *Sphagnum*, but the mosses are well hidden by the tall sward of **sharp-flowered rush** *Juncus acutiflorus*.







Here in the Lammermuir Hills in SE Scotland, in May, is **acidic rushy flush** vegetation with **soft rush** *Juncus effusus* and *Sphagnum* mosses. The water supply here appears to be from bog on deep peat immediately upslope.





This *acidic Juncus effusus – Sphagnum mire* is in a ditch in a conifer plantation in Perthshire (photographed in August).





On flatter ground in basins and valley floors are **acidic sedge or rush mires** with similar vegetation to the flushes shown in the last few pages, but with less water movement. Here is a very wet hollow in Perthshire, with a mosaic of **acidic bottle sedge-*Sphagnum* mire** (M) and, with sedges and very little else, in shallow water, **bottle sedge swamp** (S).





### Please don't call me "Valley Mire"!

Here's an **acidic mire** in a **very wet depression** in the west Highlands in June, with *Sphagnum* mosses, bogbean, bog myrtle, heather, cross-leaved heath, purple moor-grass, bog asphodel and common cottongrass. It's rather like bog but also has species indicative of **slight lateral water movement bringing in just a little mineral enrichment**.

At this site those species are slender sedge *Carex lasiocarpa*, *Sphagnum denticulatum* (photo below) and an abundance of the uncommon *S. affine*. At other sites



carnation sedge *C. panicea* can be among the indicators of water movement and mineral enrichment. This type of habitat and vegetation, which equates mainly with National Vegetation Classification community type M21, is widespread but uncommon in Britain and is kind of in between a flush and a bog. It can include the bog species *Sphagnum papillosum* (big and ochre-coloured) though the other bog indicators *S. medium/divinum* (big and red) and hare's-tail cottongrass (tufted, with wiry leaves and single white cottony heads) are rare here. It's a sort of saturated, sluggish, fairly acid flush, which might sound dull but we usually find these places pretty interesting if we're sufficiently well prepared for the very wet terrain. One thing that's a bit annoying is how some people insist on calling this kind of wetland a 'valley mire'. Many valleys have other kinds of wetland. In fact, if you find some wetland habitat in the bottom of a valley, it's most likely to be something other than their 'valley mire'.





Some other very wet, sluggish acid flushes/soakways have bog pondweed *Potamogeton polygonifolius* or bog St John's wort *Hypericum elodes* (with unmistakable pale, broad, hairy leaves + yellow flowers).



Bog St John's wort *Hypericum elodes* and bog pondweed *Potamogeton polygonifolius* in N Wales in July. Both species are positive indicators in the acidic fine-scale NPMS habitat.



Wet depression with bog pondweed *Potamogeton polygonifolius*, in N Ireland in September



**Acidic purple moor-grass *Molinia caerulea* mires** that are not in deep peat bog habitats and are either very species-poor or with *Sphagnum*, *Polytrichum*, etc, belong in this acidic marsh/fen category. Here is an example, in Fife in June. *Molinia* grows mainly on acidic peaty soils.





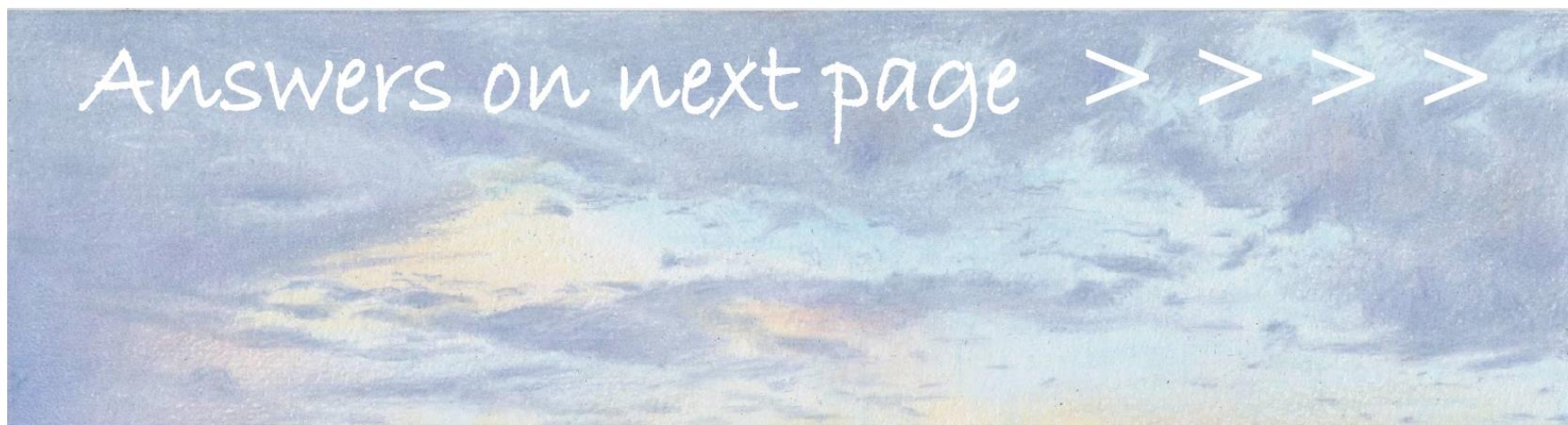
This **acidic purple moor-grass** *Molinia caerulea* mire in Argyll, photographed in June, contains abundant **bog myrtle** *Myrica gale* – a species that, despite its name, grows not just in bogs but equally commonly in wet heath and *Molinia* mire vegetation on acidic peaty soils.





I'm told that you folks doing NPMS work like to be asked **QUESTIONS** as part of the training. So here are a few questions about the sorts of acidic mires we've just been looking at:

- Q1:** Someone says: *"OMG! I'm sure I've just seen some buttercups in an acidic mire!"* What plant species do you think they saw?
- Q2:** The two commonest tall rushes in acidic mires are:
- (a) soft rush and blunt-flowered rush
  - (b) compact rush and hard rush
  - (c) sharp-flowered rush and jointed rush
  - (d) soft rush and sharp-flowered rush
- Q3:** What were the two plant species growing abundantly in the photo of an acid mire on the previous page? (No looking back!) And what do those species suggest to us about the soils in the places where they grow?







# Answers to questions on previous page

- A1:** Lesser spearwort *Ranunculus flammula*, which is a kind of buttercup really (it's in the same genus). By the way, the flowers of lesser spearwort tend to be a very slightly paler yellow than the NYC taxi yellow of other buttercups, and the petals are a little narrower (so we can see a bit more space between adjacent petals).
- A2:** (d) soft rush and sharp-flowered rush.
- A3:** Purple moor-grass *Molinia caerulea* and bog myrtle *Myrica gale*. Both grow mainly on acidic peaty soils.



Queens, seen from the east side of Manhattan, New York City



## BASE-RICH FENS, FLUSHES, MIRES AND SPRINGS FINE-SCALE NPMS HABITAT

This category includes wetlands on neutral or basic soils, so let's look at the **neutral** ones first and then the basic ones (because acid > neutral > basic seems to make sense; maybe the Americans with their MM-DD-YYYY might go neutral > acid > basic instead). Most of the sedges and rushes shown at the beginning of this document can be common here. The next few pages show some **typical mosses and herbs of mires on neutral soils**, starting with **mosses**:



*Calliergonella cuspidata*



*Brachythecium rivulare*



*Philonotis fontana*



*Bryum pseudotriquetrum*



Here are three pages of **herbs** found in various plant communities on wet **neutral** soils:



Fl 3-7

**Marsh marigold**  
*Caltha palustris*

Large heart-shaped leaves with small teeth along their edges. Big buttercup-like flowers.



Fl 7-9

**Marsh hawkbeard**  
*Crepis paludosa*

Oval leaves with large teeth, some of which point backwards. NPMS positive indicator in base-rich wetland fine-scale habitat.



Fl 5-6

**Ragged robin**  
*Silene flos-cuculi*

Narrow oval leaves in opposite pairs. Unmistakeable pink flowers with 'ragged' petals.



Fl 6-8

**Marsh pennywort**  
*Hydrocotyle vulgaris*

Easily told by its unmistakable round leaves with shallowly/bluntly toothed ('crenulated') edges.



A second page of herbs of **neutral** wetlands:



Fl 7-9



Fl 6-8



Fl 6-7



Fl 7-8

**Common valerian**  
*Valeriana officinalis*

Tall, with pinnately-divided leaves (leaflets with smooth or slightly toothed edges) and clusters of whitish or pale pink flowers.

**Angelica**  
*Angelica sylvestris*

A tall, hairless umbellifer with a purple tinge to the stems and the junctions of branches within the leaf. Bases of leaf stalks and flower stalks very wide and sheathing.

**Marsh bedstraw**  
*Galium palustre*

Leaves in whorls of 4-6. Stems and leaves rough-textured because of tiny outward-pointing hairs.

**Fen bedstraw** *Galium uliginosum*

Similar to marsh bedstraw but is more rough-textured, has 6-8 leaves per whorl and the leaf tips are sharply pointed. To show a photo here focusing on the flowers would be doing an injustice to the beauty of the leaves.



... and a third page of herbs of **neutral** wetlands:



Fl 7-9

**Marsh thistle**  
*Cirsium palustre*

Differs from the very common creeping thistle in its purple tinge and the dark spines on the stems as well as the leaves. Can be very tall.



Fl 5-9

**Water avens**  
*Geum rivale*

Lovely drooping dull pink flowers. Lower leaves each divided into a few pairs of toothed leaflets (end leaflet largest).



Fl 3-7

**Yellow flag**  
*Iris pseudacorus*

Laterally-flattened tufts of tall leaves + unmistakable big yellow flowers. NPMS positive indicator in base-rich wetland fine-scale habitat.



Fl 6-9

**Meadowsweet**  
*Filipendula ulmaria*

Reddish stems. Creamy-coloured flowers. Leaves with pairs of toothed leaflets along reddish central leaf stalk. NPMS positive indicator in base-rich wetland fine-scale habitat.



Actually, let's make this **four** pages of herbs found in **neutral** wetlands. This extra page shows five species that are listed as positive indicator species in the base-rich wetland NPMS fine-scale habitat.



**Bugle *Ajuga reptans*.** Creeping shoots with stalked, oval, obscurely-toothed leaves. Upright spikes of blue flowers.



**Opposite-leaved golden saxifrage *Chrysosplenium oppositifolium*.** Round leaves in opposite pairs, with rounded teeth.



**Marsh valerian *Valeriana dioica*.** Like a small Common Valerian but lowest leaves oval (undivided). Also more southern (N to S Scotland).



**Marsh cinquefoil *Comarum palustre*.** Leaf with 5 toothed leaflets; very dark purplish flower.



**Meadow buttercup *Ranunculus acris*.** Palmately-lobed (starry) leaf + yellow flowers.



One more species – ‘cos I nearly forgot! It’s **lesser spearwort** *Ranunculus flammula* again. We had in the acid pages earlier, but we shouldn’t fool ourselves into thinking that it always means acid soils (despite some literature giving that impression) because it’s common in many neutral mires too. And while we’re at it (indeed, there’s no end to this is there!... plants of neutral soils... plants of neutral soils... plants of neutral soils!...) **marsh willowherb** *Epilobium palustre* is also sometimes written about as an acid soils plant but I find it at least as common in neutral mires.



Lesser spearwort  
*Ranunculus flammula*  
(fl 5-9)



Marsh willowherb  
*Epilobium palustre*  
(fl 7-8)



That's enough species for the time being, so let's now look at some **plant communities of wetlands on neutral soils**.

We can start this look at neutral wetlands at the top, as we did for the acid ones, with **springs**. Here's an example (photo to right) among rushes and heath on a hillslope in Lanarkshire in October.

As with the acid springs, it's common to find that the vegetation consists mainly of mosses, and this can make the springs look very much like acid ones, or like basic ones too (as we'll see later). Some of the main differences are therefore to do with the species of mosses. In many acid springs there are *Sphagnum* species, *Polytrichum commune* and *Philonotis fontana*. In neutral springs we still find *P. fontana*, but less of the *Sphagnum* and *Polytrichum* and more of *Calliergonella cuspidata*, *Brachythecium rivulare* and *Bryum pseudotriquetrum* (photos a few pages back).







Here is a different-looking **neutral spring**, in the Lammermuir Hills (SE Scotland) in June, with more equal amounts of mosses (including the golden *Calliergonella cuspidata* and pale green *Philonotis fontana*) and vascular plants (including marsh marigold, creeping buttercup, white clover, blinks and various grasses and sedges).





Downstream from a neutral spring we can expect to see a **neutral flush**, which is likely to have a mix of mosses (including some of those shown a few pages back), rushes, sedges and herbs.

This example of a neutral flush, running down the middle of a long, narrow, shallow depression on the Inner Hebridean island of Eigg (photographed in July), is partly very rushy (soft rush and sharp-flowered rush) and partly with more sedges (including common sedge) than rushes. Throughout, it has mosses including *Calliergonella cuspidata* and herbs including lesser spearwort (see – just like I said a few pages back!), ragged robin, yellow flag and marsh bedstraw.





Similar vegetation can occupy **wider expanses of ground with wet neutral soils**, as seen here in midsummer in Stirlingshire (top L), Fife (top R) (both with sharp-flowered rush + herbs) and Perthshire (bottle sedge + herbs).





In southern lowlands **neutral rushy wetlands** can have abundant blunt-flowered rush (top) or hard rush (bottom). Both photos taken in Shropshire in July.





There could be confusion between rushy neutral wetland (as seen in the photos on the last two pages) and rushy grassland that is classed within the NPMS 'Neutral damp grassland' fine-scale habitat of the 'Lowland grassland' broad habitat. According to the NPMS guidance 'Neutral damp grassland' should be very grassy and largely grass-dominated, with abundant to dominant *Agrostis stolonifera*, *Arrhenatherum elatius*, *Festuca rubra*, *Deschampsia cespitosa* or *Holcus lanatus*, while in the NPMS 'base-rich fen/flush/mire/spring' fine-scale habitat of the Marsh and Fen broad habitat those grasses play a more subordinate role and the vegetation consists mainly of varied mixtures of rushes, sedges, herbs and mosses. Here's an example of a rushy form of the 'Neutral damp grassland' NPMS habitat:



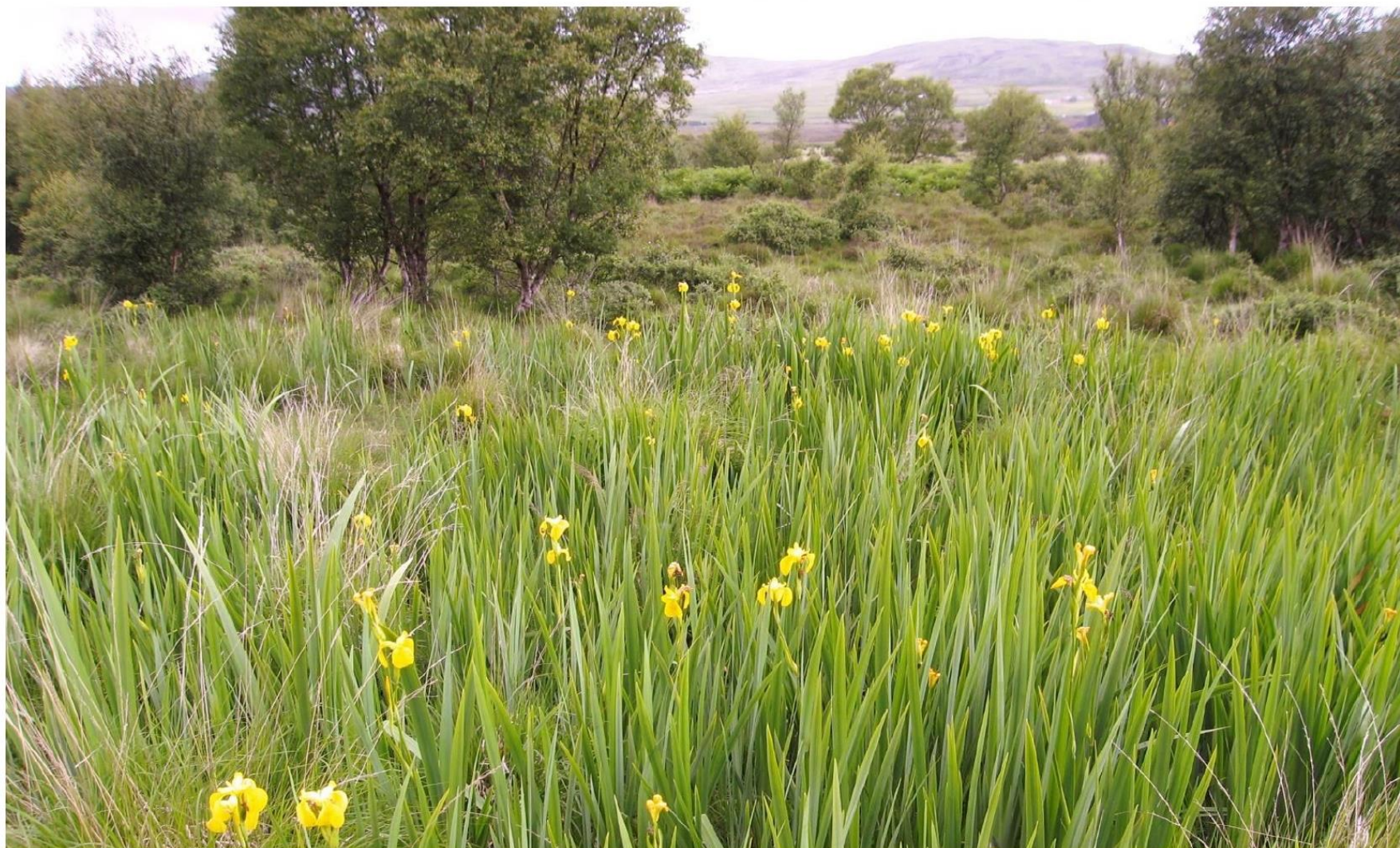


**Neutral wetlands that are not very grazed** can have a dominance of **meadowsweet** *Filipendula ulmaria*, as here in West Lothian in July. Meadowsweet is very palatable to large herbivores such as deer, sheep and cattle. Rushes are not so palatable, so dominance can switch over time between rushes and meadowsweet according to the amount of grazing (more grazed = more rushes; less grazed = more meadowsweet).





In the north and west, especially near the west Highland and Hebridean coasts, are **neutral mires** with abundant to dominant **yellow flag** *Iris pseudacorus*. This example was photographed on the island of Skye in June.





Some **purple moor-grass** *Molinia caerulea* vegetation has abundant mesotrophic herbs reflecting more or less **neutral soils** (typically with some sort of flushing bringing in at least a bit of base-enrichment) and placing them into this NPMS category. This example, in Perthshire in July, has globeflower *Trollius europaeus* (yellow dots in middle distance), water avens, meadowsweet, meadow buttercup, sedges, and, as some people say so irritatingly in commercial contexts “much more” (especially irritating if there actually isn’t “much more” on offer than what they’ve already told us!).







Here's another neutral *Molinia* flush. It looks very different because it's in October. Location: Ayrshire.





Wetland mesotrophic herbs such as meadowsweet can grow abundantly among some very tall grass or sedge species such as **common reed** *Phragmites australis*, in vegetation such as this (in the Scottish Borders), which in NPMS terms also belongs in the 'Base-rich fen/flush/mire/spring' fine-scale habitat of the Marsh and Fen broad habitat.





Other kinds of **species-poor fen or swamp vegetation** with a flora suggesting more or less neutral soils generally fit into this same NPMS category. For example this **reed canary-grass *Phalaris arundinacea*** fen in East Lothian, photographed in May so we see both last year's (very pale) and this year's (green) leaves:





... and this **lesser pond-sedge** *Carex acutiformis* swamp/fen in the lower part of a valley in the Southern Uplands. It is very species-poor, but its flora, if only by default or by what it lacks, combined with the dominance of this sedge (a species that does not favour acid habitats), suggests that soils here are probably more or less neutral, placing the vegetation into the NPMS 'Base-rich fen/flush/mire/spring' fine-scale habitat within the Marsh and Fen broad habitat:





But if we see swamp/fen-type vegetation in or along the very edges of a river, pond, loch/lake, etc, as seen here with patches of reed canary-grass *Phalaris arundinacea*-dominated vegetation in and by the River Tweed (in August), it is considered in NPMS terms to be part of the Freshwater broad habitat.





Time now to move on – at last! – to the genuinely **base-rich** end of the NPMS ‘Base-rich fen/flush/mire/spring’ fine-scale habitat, starting with a big welcome for **THE BROWN MOSSES!** No, it’s not a band. It’s just ‘ecologist speak’ for a group of brown, gold and purple (and even some partly green) mosses that are common in base-rich wetlands.



*Campylium stellatum*

“Ooh – I’m such a **GOLD STAR!**”

Huh.



*Scorpidium revolvens*

“**What Went Wrong?**”



*Scorpidium scorpioides*

“They call me **BIG PURPLE**”



*Palustriella commutata*

“**GOLD ‘N’ BOLD!**”



*Ctenidium molluscum*

“*lookin’ fancy*”



We've already seen some **vascular plants that grow in base-rich wetlands** – hard rush, glaucous sedge, carnation sedge and bottle sedge (all of them also found on neutral or even acid soils) – but here are a few more that are at least locally common on wet, base-rich soils. The first three are listed as positive indicators in this NPMS fine-scale habitat.



Fl 5-7

**Butterwort *Pinguicula vulgaris*.**  
Unmistakeable rosettes of sticky yellow-green leaves.



Fl 6-9

**Yellow saxifrage *Saxifraga aizoides*.** Rather fleshy, narrow leaves and many yellow flowers.



Fl 5-6

**Black bog-rush *Schoenus nigricans*.** A tussocky, wiry-leaved sedge with very dark flower heads.



Fl 6. Fr 7-9

**Common yellow-sedge *Carex demissa*.** Short. Yellow-green. Leaves to 5 mm wide. 'Starry' female spikelets + adjacent long, outward-spreading leafy bracts.



**Q4:** The 'starry' female spikelets of that last species – common yellow-sedge *Carex demissa* – could lead to confusion with star sedge *C. echinata*.

Which species is tallest?

- (a) common yellow-sedge
- (b) star sedge

Which species has the widest leaves?

- (c) common yellow-sedge
- (d) star sedge

And which one has the longest bracts accompanying the female spikelets?

- (e) common yellow-sedge
- (f) star sedge

Here's the photo of common yellow sedge again >>

Where's the photo of star sedge?  
It's in your memory, of course!



**Q5:**

<< See the leaf to the left.  
What species is this?





## Answers to questions 4 and 5...

4: **4b:** star sedge is tallest

**4c:** common yellow-sedge has the wider leaves

**4e:** common yellow-sedge has the longer bracts

5: **Meadowsweet.** These leaves are unmistakable because of their combination of:

- red stalks

- toothed leaflets arranged in pinnate fashion

- minute 'leaflets' in between the 'proper' leaflets





Now on to base-rich wetland plant communities, starting with springs. Here is one of the commonest types of **calcareous spring** in which the main species is the golden-coloured moss *Palustriella commutata*. These springs can often be noticed from a distance because of their colour. This one is in Argyll and was photographed in June.





Here is a similar **calcareous spring**, this one (in Perthshire in July) with a stony, **base-enriched flush** running down from it. The flush vegetation is sparse but includes quite prominent scattered plants of yellow saxifrage *Saxifraga aizoides*.





Here is another **base-enriched flush** in Perthshire in July, with brown mosses, small sedges and jointed rush.





Many of these **base-rich flushes** are small and narrow, but here's a wider one in Sutherland in September. This one has an abundance of **black bog-rush** *Schoenus nigricans* (pale grey-brown) in the middle distance.





Some base-enriched mires are more thickly vegetated. Even though they can be of high botanical interest, as in this example of **base-rich sedge mire** in the Lammermuir Hills (photographed in June 2012; sedge mire area arrowed in white), they can look very nondescript from a distance:





... and from quite a lot closer in too! The sedge mire is the pale green vegetation in the lower half of the photo.

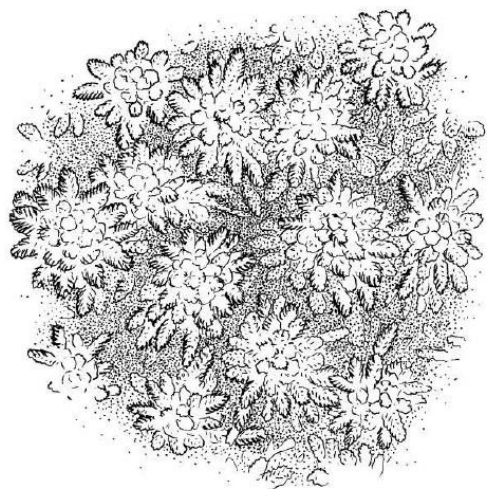


**Q6:** From this distance we can't really tell if this sedge mire belongs in the acidic or base-rich fine-scale NPMS habitat. We need to get a closer look. If we imagine it's actually of the acid type, what will be most likely and most visually distinctive botanical clues revealing that acidity to us when we get in there to look closer?



Answer to Question 6: These mosses:

*Sphagnum*



*Polytrichum commune*







So – **what**, one might ask, was actually growing in that boring-looking sedge mire on p. 54 to show that it's of **high botanical interest** and fits into the **base-rich** NPMS fine-scale habitat type?

Oh, just stuff... yunno... this and that... like the moss *Tomentypnum nitens*.

**WHAT? *TOMENTYPNUM NITENS?* WOW – THAT'S SO RARE!**

Well, yeah... I mean... I was kinda like: “*oh, there's some Tomentypnum nitens...*”



*Tomentypnum nitens*:  
one of the rarer  
'brown mosses'



I wrote that last page yesterday. Today (8<sup>th</sup> July 2020), having not seen that species of moss since back in 2012, it was just another day and I happened to go with my wife Alison and our daughter Elen to some springs and flushes a couple of kilometres into the hills from our house, for a fairly casual look around and to get a photo of jointed rush *Juncus articulatus* to show y'all (it's a common species but I'd never photographed it), and... "oh, there's some *Tomentypnum nitens*." Previously unknown on our side of these hills, or indeed anywhere in this county. Anyway, I got a photo of the rush...





Here is a photo showing part of a larger extent of **base-enriched sedge mire** on level, very wet ground in the Scottish Borders, in July. The sedge mire here, with abundant bottle sedge and common cotton-grass, is the ochre-coloured vegetation between the foreground soft rush/bottle sedge/meadowsweet mix (appearing more neutral but still falling within the NPMS base-rich wetland fine-scale habitat) and the background willows.





### ☹️ NPMS NEGATIVE INDICATORS IN THE MARSH AND FEN BROAD HABITAT ☹️



**Stinging nettle**  
*Urtica dioica*

Classed as a negative indicator because it can increase in response to unnaturally (and variably damaging) high levels of nutrients.



**Himalayan balsam**  
*Impatiens glandulifera*

Amazing in being so big and tall despite being just an annual, and with nice pink flowers too – but it takes over at the expense of other plants of damp (especially riverside) ground and is not easy to eradicate.



**Tufted hair-grass**  
*Deschampsia cespitosa*

A big grass with dense tussocks of stiff leaves whose upper surfaces have many parallel ridges and grooves and a rough texture. Mainly on neutral soils. Has potential to outcompete smaller plants, especially if grazing is light enough for it to grow tall and dense.



**Soft/compact/hard rush**  
*Juncus effusus / conglomeratus / inflexus*

Tall, tufted rushes with a small flower head on one side of each stem. They grow naturally in various damp to wet habitats but can increase in abundance as a result of ground disturbance and/or overgrazing.



**Broad-leaved/curled dock**  
*Rumex obtusifolius / crispus*

These tall docks are most common where there has been some kind of disturbance to the soils; for example from trampling by livestock, or by agricultural vehicles. They are commonest on nutrient-rich soils.



We've come to the end, so I hope this tour through the various types of Marsh and Fen helps you to classify these habitats in future NPMS work.

And, when you're telling people (friends, family, anyone, everyone...) about Marsh and Fen, remember to say **"Marsh and Fen"** as clearly as you can, so that these people don't think you're saying what my wife Alison thought she heard when I first mentioned the name of this NPMS habitat:

**MARTIAN FEN !**



Alison



'Mars' (done in Microsoft Paint)