Vegetative Grass Identification

Webinar 1 – The Essentials

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Botanical Society of Britain & Ireland

An Roinn Cultúir, Oidhreachta agus Gaeltachta
Department of Culture, Heritage and the Gaeltacht

National Parks & Wildlife Service

CEDaR
Centre for Environmental Data and Recording

Plan for this Webinar

TODAY:

Brief Introduction-

How many species? Why ID with vegetative features? What do I need?

Important terminology for vegetative identification

Have I a grass, sedge or a rush?

NOTE:

Second Vegetative Grass ID Webinar on 11th June will:

-Build on your ID skills once you know the basics today

-Become more familiar with vegetative grass ID keys

-Know how to confidently identify a selected number of grass species vegetatively

How many Irish species are there?

Approximately 100
Includes all native species and all archeophytes (non-native species introduced before 1500).

It also includes the more common neophytes (non-native species introduced after 1500)

Native	80 species
Very common*	26 species
Very rare**	22 species

* Recorded from more than 700 Irish hectads (1 hectad = 10km²)
** Recorded from less than 50 Irish hectads (1 hectad = 10km²)

Advantages in learning to ID grasses vegetatively:

Can ID all year round (except for annuals - not evident in winter)

Can ID even if grass mowed or grazed

Don't have to wait for grass to flower

In most flowering plants, new growth occurs at the shoot tips only

BUT in Grasses…

New growth occurs at the **base** so that regrowth is possible when tip is removed by grazers, fire, or lawnmowers.

Makes it easier than other plants to identify vegetatively at any time of year even if cut

When grass not in flower:

We depend on **non-flowering** vegetative features

Grasses look green and all the same and you're asking me to tell the difference without grass heads???

There is a perception that this is difficult

Don't be put off, they are more accessible than you think…

3 main aspects to vegetative ID:

1. Recognising and examining a selection of vegetative (non-flowering) features
2. Measuring widths and lengths
3. Being familiar with ID key(s) and how they work

And yes it does take practice
But once you are familiar
with the basics – easier to progress

REMEMBER:

Features are **small, some tiny** – need a hand lens

Most features shown in photos or diagrams today are magnified many times

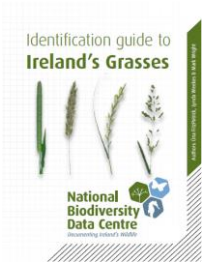
So think small – need to **get in really close** with grass specimen

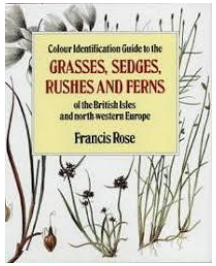
What you will need:

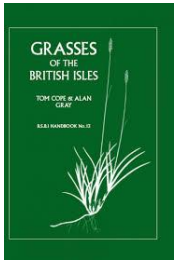
1. Hand lens:
x 10 magnification
(handy to get one with X10 and x20 lenses)

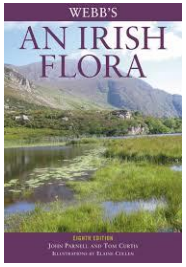
2. Transparent 6 inch ruler
Many keys will have rulers along page margins or at the back but handy to use a little ruler

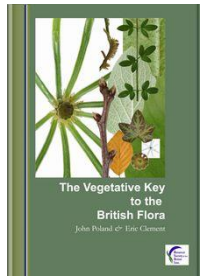
3. Key/ID guide:
A variety to choose from
We will look at some of these in more detail in Session 2 on 11th July
…. lets get the basics right first











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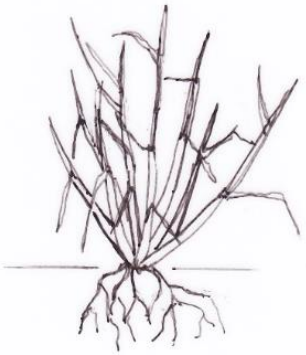
Overall structure of a grass – vegetative features (non-flowering)

Newest leaf:
rolled or folded in bud



Tufted habit:
The grass plant grows in a compact clump,
usually without rhizomes

Leaf:
Arise from top of sheath

Stolon: creeping stem spreading horizontally **above** ground that can root at the nodes

Sheath: wraps around stem

Tiller (new plant arising from rhizome)

Ground level

Rhizome: creeping stem spreading horizontally b**elow** ground

Recognising and examining a selection of features in more detail:

1. Leaves
Width, length, hairy (where?), hairless, prominently ribbed or not, stiffness, colour (green or greyish)

2. Youngest leaf in bud
Is it rolled like a scroll, is it folded?

3. Sheaths
Colour, hairy, hairless, open or closed?

4. Ligules
Length, membranous or comb of hairs, shape

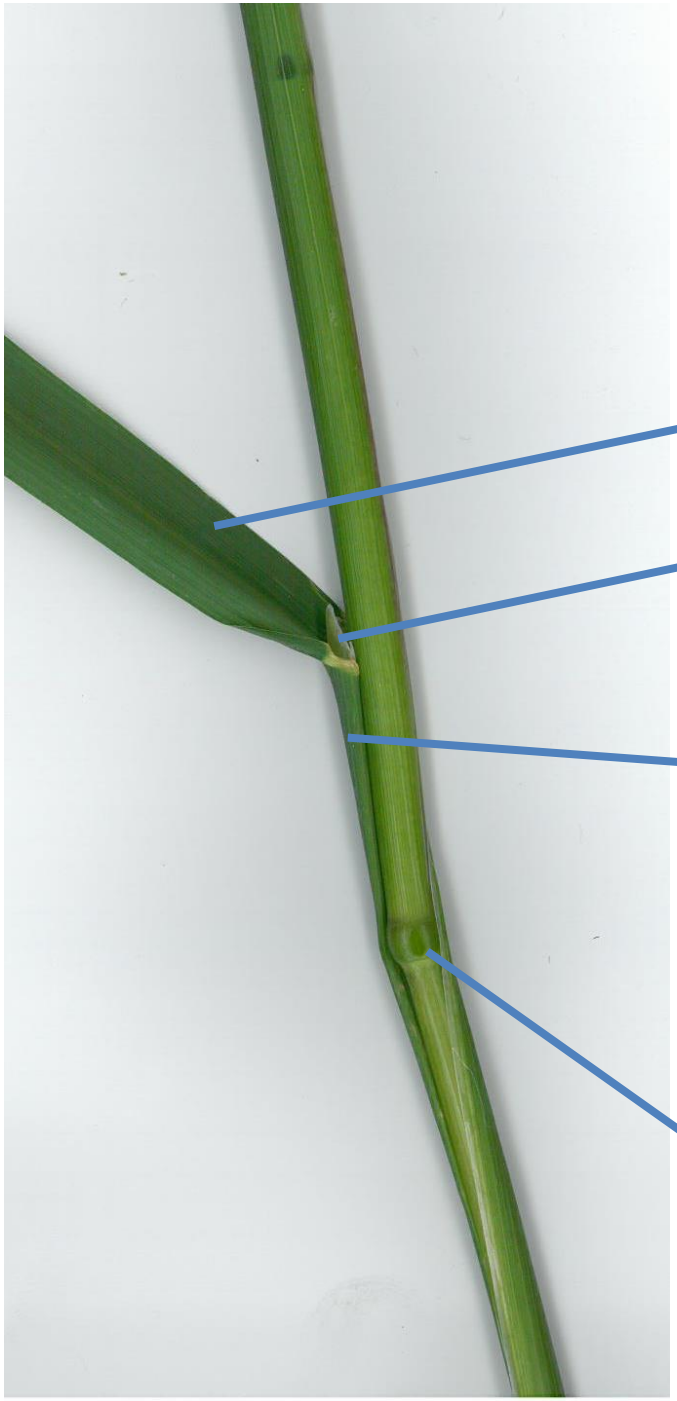
5. Auricles
Present, absent, shape

6. Stems (culms)
Flattened in cross section or rounded, colour at base, bulbous or not at base

7. Annual or perennial?
Ways on how to tell

8. Rhizomes & stolons
Present absent, one or other or both? Ways to tell

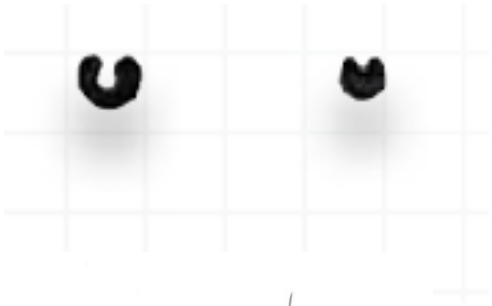
LEAF, SHEATH & NODE



1. Leaves in more detail

Width & length

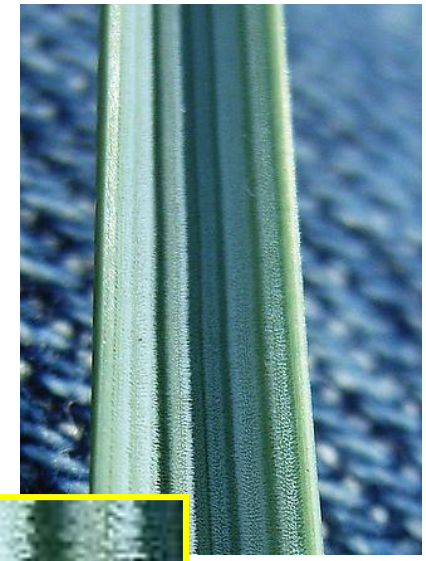
Leaf flat	versus	Leaf Bristle-like



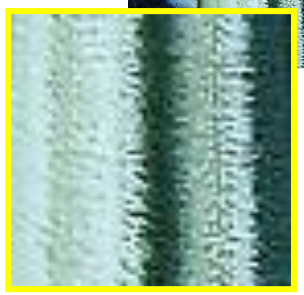
1. Leaves in more detail

Hairy (where?), hairless, prominently ribbed or not, stiffness, colour (green or greyish)

Leaf prominently ribbed	versus	Not prominently ribbed



Looks grey green (glaucous) – often in coastal grasses, often stiff leaves



This one has hairy ribs

Hairy in close up

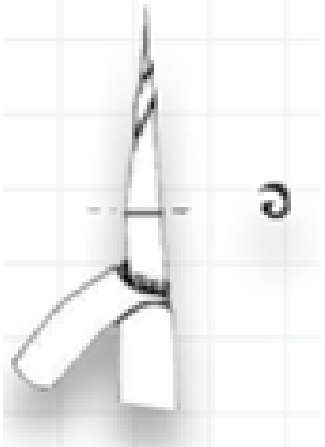
Leaves can be hairy all over or just on the ribs or hairless

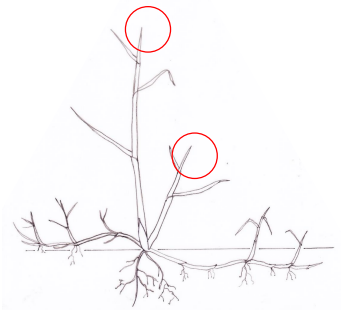
2. Youngest leaf in bud

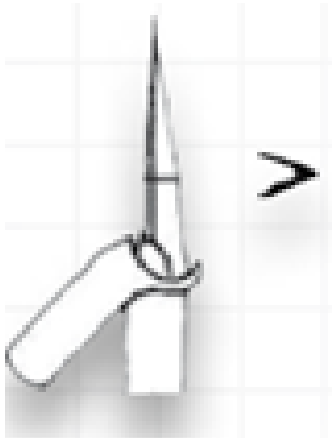
Where? Top of growing tips

Is it rolled like a scroll or is it folded?

Rolled in the shoot	**versus**	**Folded in the shoot**







3. Sheaths

Where? Wrapped around stems

Colour, hairy, not hairy

Sheath hairless	**versus**	**Hairy**

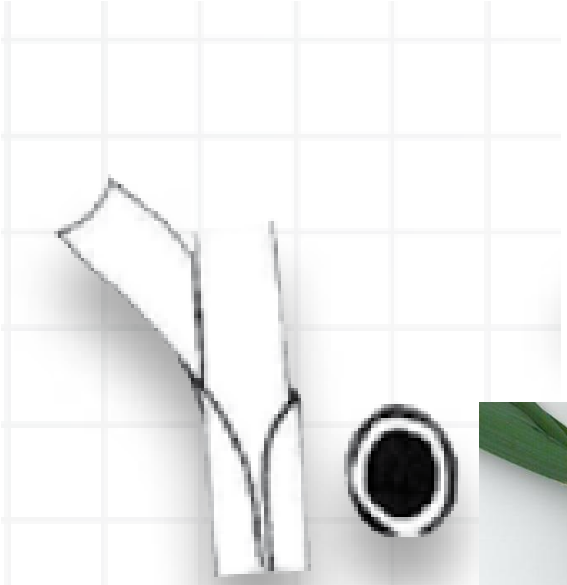
This sheath is green all over

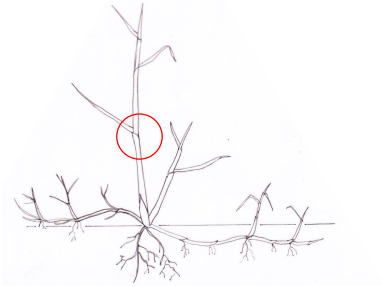
This sheath is yellow-green with distinctive pink stripes

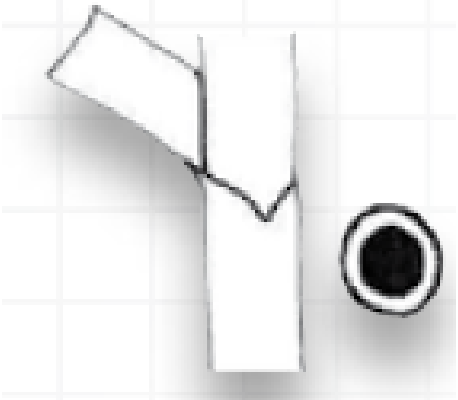
3. Sheaths

Open or closed

Sheath open	versus	Sheath closed







Sheath tubular, closed like a v-neck jumper on the top

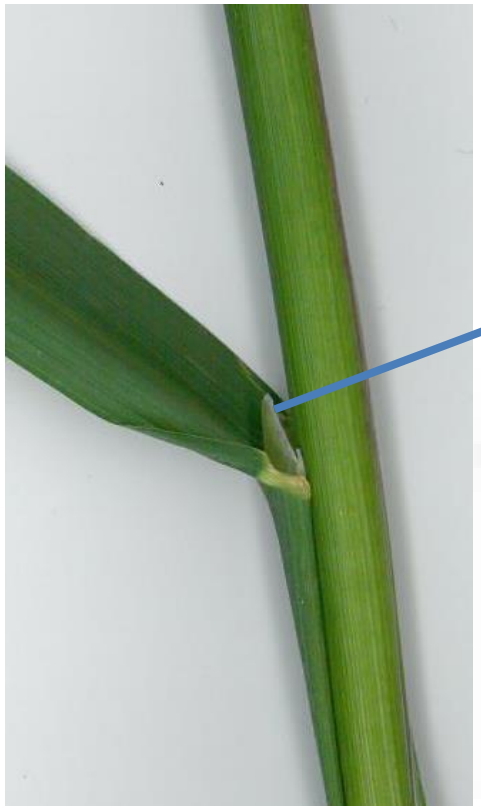
Leaf sheath open (may be overlapping) on the top

4. Ligules

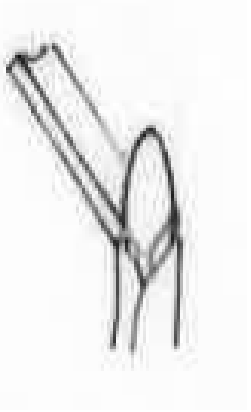
Where? The junction at the top of the sheath where the base of the leaf is found

Membranous or comb of hairs

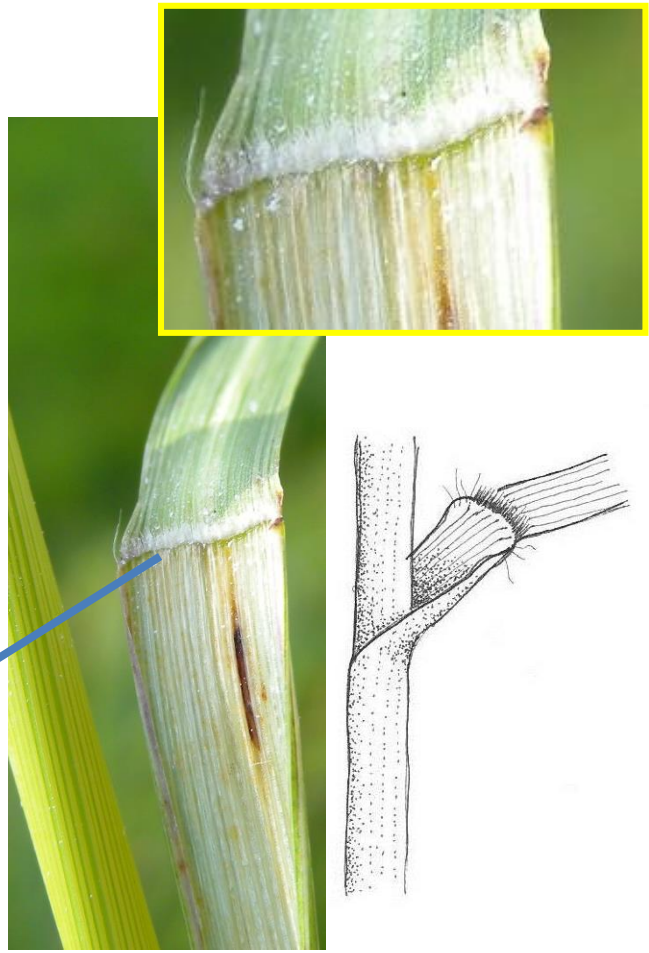
Ligule membranous	**versus**	**Ligule a comb of hairs**



Ligule
(membranous)



Ligule
(Comb of hairs)



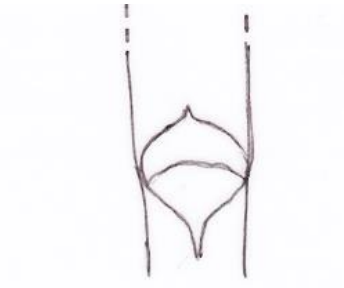
4. Ligules

Shape and length

Broader than long

Longer than broad

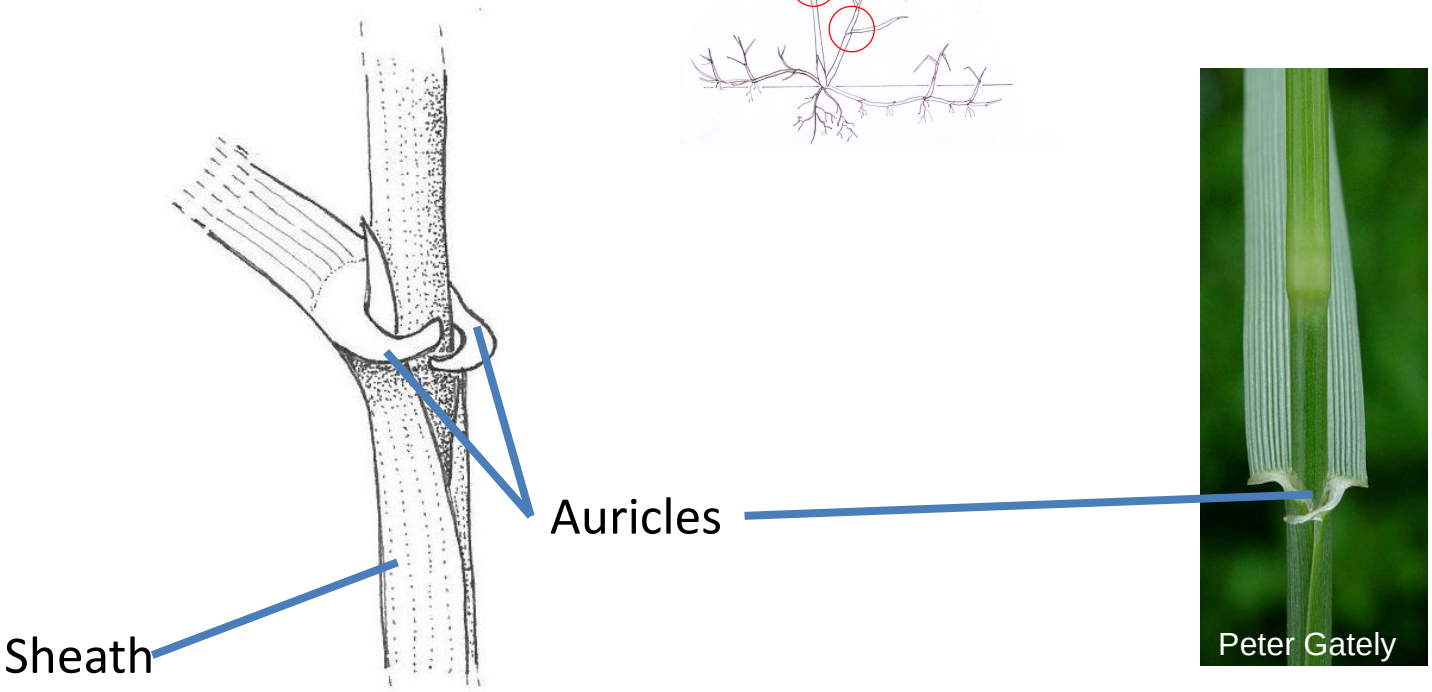
Ligule very long



Ligule with distinctive point

5. Auricles

Where? Projections at the top of the sheath on the side opposite the base of the leaf



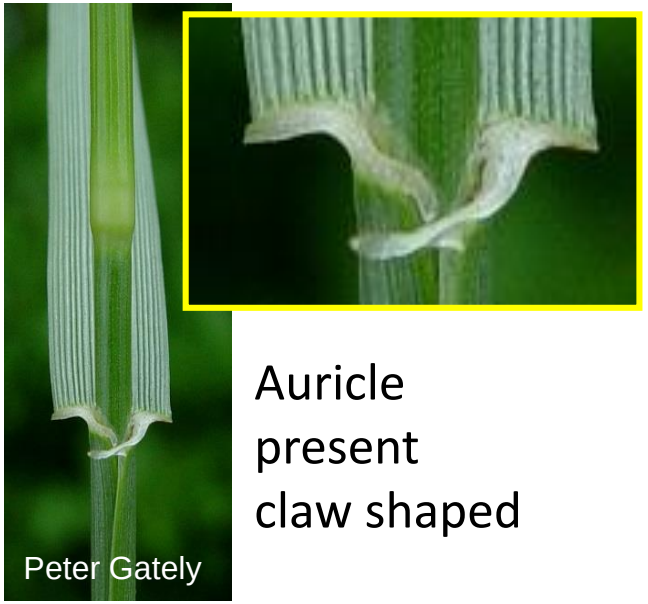
5. Auricles

Present, absent, shape

Auricle absent

Auricle present
almost thread-like

Auricle present
lobe shaped



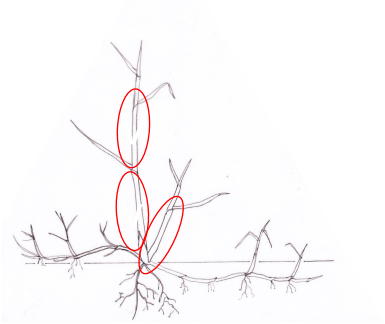
Auricle
present
claw shaped

6. Stems

Where? Parts that support leaves and surrounded by sheaths

Flattened or rounded in cross section

Stem rounded	versus	Stem flattened



Some species can have very flattened stems

7. Annual or perennial?

Annual – seeds germinate, grass grows, flowers and dies in the same year

Perennial - seeds germinate, grass grows, flowers and dies over several years

Annual	**versus**	**Perennial**

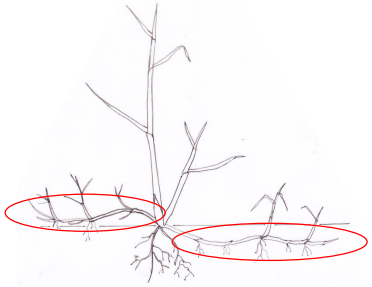
Annual:
New green growth is visible only.

Entire plant is dead and straw like after flowering.

Perennial:
Often with remains of old sheaths at base & dead leaves from previous years

8. Rhizomes & stolons

Present, absent, one or other or both?



Ways to tell:

Creeping	**versus**	**Tufted**

If Rhizomes/stolons present
Gives carpeted look

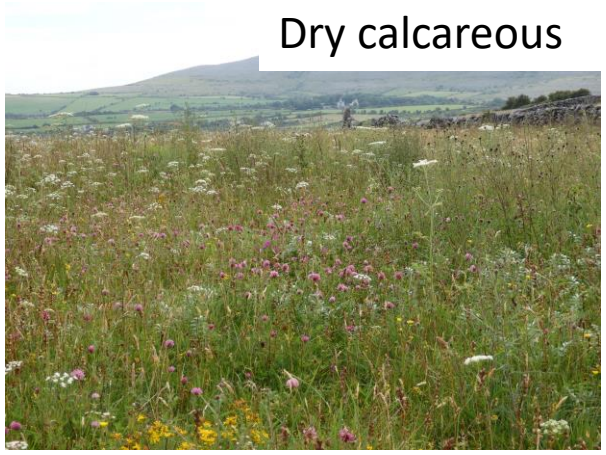
Stolons & rhizomes absent (or very short), grass grows in a compact clump

Habitat can also be important:

What sort of habitat, wet/dry or peaty poor/rich well-drained soil, coastal/inland

Can be a good indicator of what species you might have (and vice versa)

Some habitat examples:



Have I a grass, sedge or a rush?

Graminoids: Plants that are grass- like in appearance

There are three families that can be considered as Graminoids:

The grasses (*Poaceae*)
The sedges (*Cyperaceae*)
The rushes (*Juncaceae*)

What's the difference?

With flowering/fruiting features – easy to tell apart with a hand lens

With vegetative features only – look more closely with a hand lens at a combination of features

Simple and general rule based on stems:

Sedges have edges

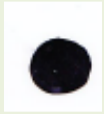
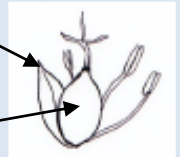
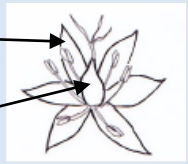
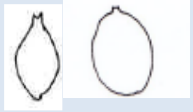
Grasses have ‘knees’ (nodes)

Rushes are round

GOOD START
but
NOT ALWAYS THE CASE
More detail needed

Blue is diagnostic but we can assume we don't have flowering parts

Green are vegetative features we must examine in combination with each-other

Feature	Sedges (Cyperaceae)	Rushes (Juncaceae)	Grasses (Poaceae)
Stem	Often triangular in section Almost always solid 	Almost always rounded in section Solid or hollow and sectioned internally 	Never triangular in section Almost always hollow between nodes 
Ligule	Ligule often fused to leaf along most of its length 	Often have none	Ligule (hairs or membranous) attached at base and free along its length 
Flowers	Single glume-like scale at base of each flower Glume Flower (**utricle**) OR **nut** 	Six flower segments surrounding each flower Segment Flower (capsule) 	Two scales, the lemma and palea surrounding each floret Pair of outer glumes at base of each spikelet Glume 
Fruits	Single lens shaped or three angled achene per flower 	Fruit capsule bearing numerous seeds 	Single grain-like seed per flower 

If I come across a graminoid I'm not sure of:

Grass? or could it be a sedge?

What features do I check?

If I come across a graminoid I'm not sure of:

1. Examine stems:

a. Rounded or triangular?

Triangular

b. Solid or hollow?

Solid inside

2. Examine ligules:

Are they fused along their length on leaf ?

Or only attached to the leaf at the base?

Ligule attached along its length
only a tiny bit free on top
(leaf peeled back here)

If I come across a graminoid I'm not sure of:

SEDGE

1. Examine stems:

a. Rounded or triangular?

Triangular

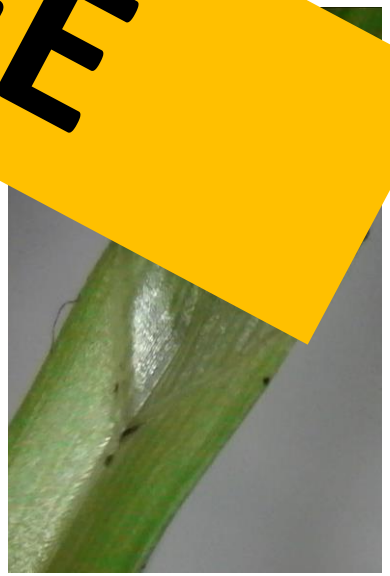
b. Solid or hollow?

Solid inside

2. Examine ligules:

Are they fused along their length on leaf ?

…nly attached to the leaf …e?



…igule attached along its length only a tiny bit free on top (leaf peeled back here)

Most rushes are easy enough to recognise – at least to know they are not grasses
Stems rounded in cross section, if not, generally stiff and shiny, often spongy inside
….but that's for another day….

BUT what if a rush looks 'grassy' how can I be sure it's a rush?

If a rush looks ‘grassy’ how can I be sure it’s a rush?

You most likely **won’t find a ligule**, if present, usually very small and insignificant

Look closely at leaves – Usually have **long** whiskery hairs

If a rush looks ‘grassy’ how can I be sure it’s a rush?

You most likely **won’t find a ligule**, if present, usually very small and insignificant

Look closely at lea have **long** whiskery hairs

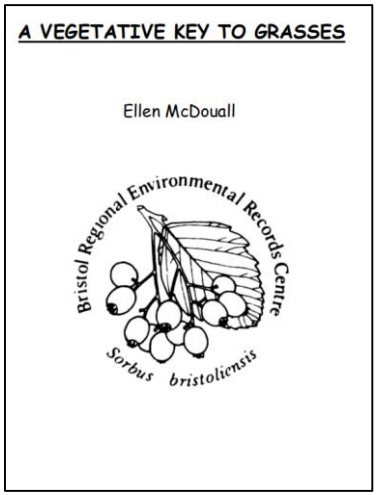
Rush

Want to practice but no book or key of your own?

Any free online vegetative grass keys?

Found one that is a great introductory one:
Bristol Regional Environmental Records Centre:
http://brerc.org.uk/books.htm#booklets

Contains a good selection of grasses but not all
Download is designed to print as a booklet



Recommendation:

Go out anywhere e.g. a garden, park, waste area, fields, mountains – have a close look at the grasses growing there

Can you find and describe:

The ligule

Whether youngest leaf rolled or scrolled in bud

Does it have auricles?

Are the leaves hairy or not?

Are the sheaths hairy or not?

Is the grass tufted or creeping?

Annual of perennial?

Flattened stems?

The habitat?

If you have a key, bring it with you, give it a go

This will set you up nicely for second webinar on vegetative grass ID

To finish:

DO buy a hand lens (x10 magnification)

DO practise – it takes patience and effort to learn a new skill

DON'T lose heart if it doesn't come naturally to you or you find it challenging

DO seek help and support – join a local naturalists group or better still BSBI

DO record your species and send in records to BSBI and/or Wildlife records centre e.g. National Biodiversity Data Centre

Your records are important no matter how common the species is

BSBI - https://bsbi.org/

NBDC - https://www.biodiversityireland.ie/

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