

Carnie Woods

Carnie Woods, on the edge of Westhill, 8.5 miles west of Aberdeen, includes a wide range of habitats, and hence a high diversity of plants. The site includes conifer woods, mixed woods, a rowan orchard, heathland, grassland, and fen, making it a good location to practice the ID of grass and grass-like species (rushes and sedges).

Getting there

Bus: The number X17 bus will take you to Westhill. Get off at Elrick, just past the petrol station, walk a bit further and turn left down Peregrine Road. The path to enter Carnie is on your right a bit further down Peregrine Road.

Bicycle: To cycle to Carnie, it is best to head west out of Aberdeen along Countesswells Road. Follow this road to Wester Ord, following which turn north (right) and cycle until you meet the main road at a roundabout. Go straight ahead, and the car park for Carnie Woods is 650 m ahead on the right. It should be noted that there are no cycle racks in the car park.

Car: Take the A944 (Lang Stracht) out of Aberdeen to Westhill, continuing to Elrick. Park either on Peregrine Road, which is left just past the petrol station (NJ 812 063) or in the Carnie Wood car park, for which turn left on the B979 on the west edge of Elrick; the car park is a short distance on the left (NJ 811 063).

Where to go once there



You will enter at one of the red arrows, there are well used footpaths and board walks throughout the site. Enjoy exploring all of it, you should see red squirrels! All the species in the guides should be found by exploring the yellow area of heath/grassland and the red area of fen/ marsh/grassland and woodland edges.

CAUTION there old peat cuttings full of Sphagnum (bog moss), ditches and very boggy areas that you will sink in if you walk through them. Some board walk is very slippery when wet.

Introductory guides are available for **rushes, sedges** and **grasses** at Carnie.

It should be noted that the keys are informal and designed to be used at Carnie. They cover a range of species that are common and easily found at the site, and which illustrate the key features needed to identify these species groups. They do not cover the entire range of species present at the site – you will find species that have not been included.

When you identify a plant by its flowers, always take note of what the leaves look like so that you can identify it again when it is not in flower!

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1. John Somerville <http://www.british-wild-flowers.co.uk/J-Flowers/Juncus%20squarrosus.htm>
2. Pethan Houten http://commons.wikimedia.org/wiki/File:Juncus_effusus02.jpg
3. Krzysztof Ziarnik https://commons.wikimedia.org/wiki/File:Carex_panicea_kz.jpg
4. SAGT <https://www.flickr.com/photos/sagt/9724538227>
5. Matt Lavin https://commons.wikimedia.org/wiki/File:Avena_sativa_%283873730983%29.jpg
6. Matt Lavin https://www.flickr.com/photos/plant_diversity/3920836312
7. Matt Lavin https://www.flickr.com/photos/plant_diversity/3820999332
- A. Kristian Peters https://commons.wikimedia.org/wiki/Luzula#mediaviewer/File:Luzula_multiflora.jpeg
- B. Krzysztof Kenraiz, http://commons.wikimedia.org/wiki/File:Luzula_multiflora_kz1.jpg1.
- C. James Lindsey https://commons.wikimedia.org/wiki/File:Juncus_effusus.2.jpg
- D. John Somerville <http://www.british-wild-flowers.co.uk/J-Flowers/Juncus%20squarrosus.htm>
- E. <https://secure.flickr.com/photos/fabelfroh/2477968207>
- F. Bas Kers <https://secure.flickr.com/photos/21933510@N07/6851827409>
- G. Krzysztof Ziarnik https://commons.wikimedia.org/wiki/File:Carex_panicea_kz.jpg
- H. Tyler Smith <https://secure.flickr.com/photos/carex/6142681128>
- I. Phil <https://secure.flickr.com/photos/capitphil/5642797684>
- J. <https://secure.flickr.com/photos/79818573@N04/14191108802>
- K. Sarah Gregg <https://secure.flickr.com/photos/wild-eyes/10713319425>
- L. <https://secure.flickr.com/photos/macleaygrassman/6804103598>
- M. <https://secure.flickr.com/photos/starr-environmental/9213335644>
- N. https://secure.flickr.com/photos/plant_diversity/3877497735
- O. James Lindsey <https://commons.wikimedia.org/wiki/File:Holcus.mollis.jpg>
- P. Kenraiz https://commons.wikimedia.org/wiki/File:Holcus_mollis_stem_kz.jpg
- Q. Franz Xaver http://commons.wikimedia.org/wiki/Avenella_flexuosa#/media/File:Deschampsia_flexuosa_1.jpg
- R. Christian Fischer <http://upload.wikimedia.org/wikipedia/commons/e/eb/DeschampsiaCespitosa1.jpg>
- S. James Lindsey <http://commons.wikimedia.org/wiki/File:Agrostis.canina.jpg>
- T. James Lindsey <http://commons.wikimedia.org/wiki/File:Poa.annua.jpg#/media/File:Poa.annua.jpg>

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Identifying grasses, sedges and rushes - Order Poales

The order Poales contains three species groups: grasses, sedges, and rushes. Each of these groups shares a somewhat similar growth form: long, blade-like linear leaves, inconspicuous wind-pollinated flowers, and often a creeping or tufted growth habit.

Rushes- Juncaceae

Of the three groups, rushes are the most easy to tell apart. Rushes are divided into two main groups: the wood rushes (*Luzula*) and rushes (*Juncus*). These both exhibit the same flower structure, which differs strongly from that of grasses and sedges. Rush flowers are tiny and brown, with six petals (actually “tepals”) surrounding six stamens and an ovary with three stigmas which develops into a brown “nutlet”. Flowers occur in more or less tightly bunched clusters. There are some key differences between wood rushes and rushes:

- Wood rushes always have flat, grass-like leaves, which have sparse, long, white hairs around the edges. They often have a basal rosette of leaves, with a central flowering stem which may have leaves coming off the sides.
- Rushes may or may not have leaves; if they are present, they can be either flat or cylindrical and are hairless. If they lack leaves, the plant grows as a large mass of cylindrical, pith-filled stems, upon which the inflorescence is borne laterally.



Fig 1. Open flowers of *Juncus squarrosus* prior to fruit formation.

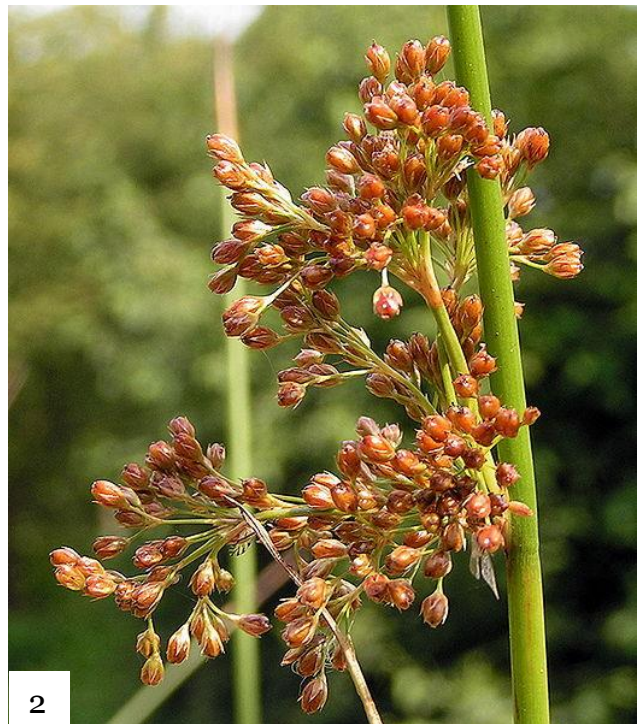


Fig 2. Nutlets of *Juncus effusus*

Sedges - Cyperaceae

Sedges are easily confused with grasses, as they have grass-like leaves and flowers in a spike. Key features of sedges which are different from grasses, however, are:

- The stems of sedges are usually triangular, or rounded triangular. This character can be checked easily by rolling a stem between your fingertips.
- Sedge stems are unjointed, lacking nodes up the stem, and are typically solid in cross-section.
- The leaves are usually arranged in ranks of three around the bottom of the stem, which gives the plant a triangular appearance that can be easily spotted from above in many cases.
- Each floret consists of a single scale like “bract” (glume) behind which is a rounded fruit (utricle) or stamens (in unisexual flowers) or both (in bisexual flowers). Unisexual flowers are typically arranged into separate male and female inflorescences called spikelets.



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Figure 3. A male spikelet at the top of the stem and a female spikelet below.

Figure 4. *Carex arenaria*. The leaves are growing clearly in whorls of three, giving the plant a triangular appearance when viewed from above.

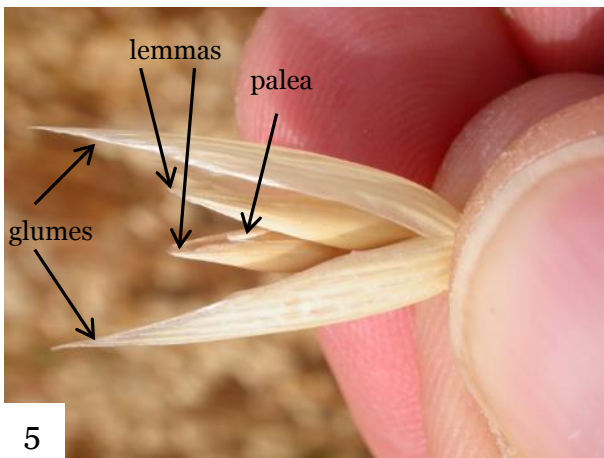
Grasses - Poaceae

Of the three groups, grasses are the most numerous and perhaps the hardest to identify. The key features of grasses that differentiate them from sedges and rushes are:

- Hollow, round stems, which have swollen nodes occurring along their length
- Leaves in two alternating ranks up the stem.
- Variable inflorescence structure based around the concept of the spikelet. A spikelet consists of two leaf like bracts, called glumes, within which are held a small number of grass flowers. The grass flowers themselves are made of two bract-like structures called the lemma and palea, which enclose the reproductive organs.

Other features that are distinctly important to grass identification:

- The shape of the ligule, a thin membrane present where the base of the leaf meets the stem
- The growth habit of the grass, whether it grows in tussocks or creeps along the ground
- Whether any of the spikelet structures (lemmas, glumes) have a long, bristle-like structure protruding from the end (an “awn”)
- The arrangement of grass spikelets into inflorescences. Spikelets may either be held directly on to the stem without a stalk (a “spike”), held on to the stem closely, but with a short stalk, creating a dense flowering head (a “spike-like panicle”), or be held loosely on many-branched, long stalks (a “branched panicle”)



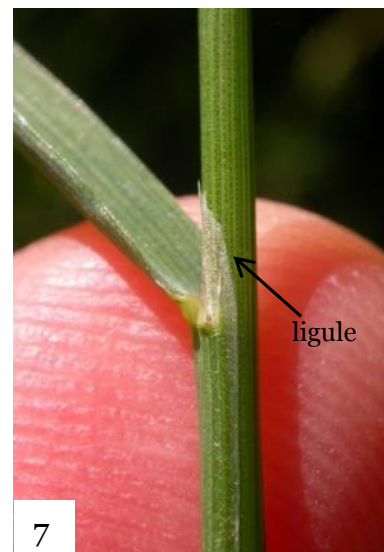
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Figure 5. Structure of a grass spikelet showing two grass flowers (each with a lemma and a palea) held between two glumes.



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Figure 6. Grass spikelet demonstrating awns, long bristle-like projections from the lemmas.



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Figure 7. Ligule of *Agrostis stolonifera*.

Guide to rushes at Carnie

1. Leaves flat and blade-like (c. 6 mm wide), with long white hairs particularly at the edges. Inflorescence borne on a central stalk. (*Luzula multiflora*) (A, B)



2. Many tall, smooth, cylindrical stems filled with spongy pith. Inflorescence held on the side of the stem. (*Juncus effusus*) (C, see also 2)



3. Tough, wiry leaves in a basal rosette, which are strongly bent backward toward the ground. Inflorescence held at top of central stem. (*Juncus squarrosus*) (D, see also 1)

Guide to sedges at Carnie

1. Flowers all either male or female (unisexual). (2, *Carex*)

Flowers all bisexual, with numerous long silky hairs, like a cotton bud. (3, *Eriophorum*)

2. Large sedge (to 100 cm) found in wet areas. Plant has multiple male spikelets and multiple large (3-8 cm), cylindrical, brown female inflorescences dangling loosely from the stem. Leaves usually > 40 cm long, 2.5 - 4 mm wide. (*Carex rostrata*) (E)

Smaller sedge (usually 10-20 cm tall) with smallish, black and green female spikelets. Each utricle is biconvex in shape. (*Carex nigra*) (F)



Small sedge with blue-green leaves. Female spikelets bright green, somewhat irregularly and loosely arranged. Leaves 3-5 mm wide. Plant often present as mats of blue-green leaves. (*Carex panicea*) (G)

Small sedge with yellow-green leaves. Female spikelets are short (7-13 mm), somewhat pineapple-shaped, and clustered around a single male spikelet. (*Carex viridula*) (H)



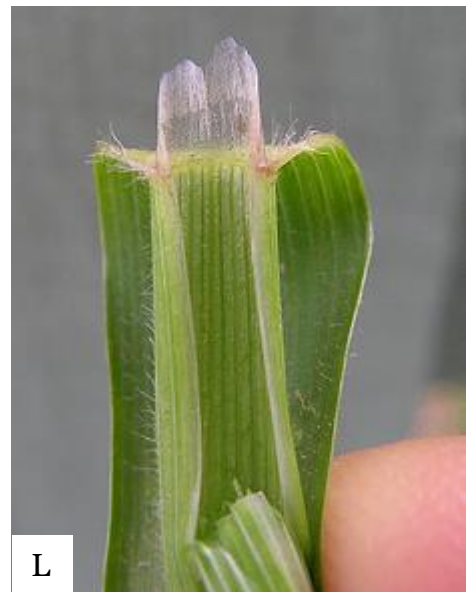
3. Single flower head per stem, with bristle-like leaves; plant forming dense tussocks.
(*Eriophorum vaginatum*) (I)

Several stalked flower heads per stem, leaves broader, with far-creeping rhizomes.
(*Eriophorum angustifolium*) (J)



Guide to grasses at Carnie

1. Spikelets held in dense, spike like panicle, each with two awns. Plant growing in a tufted habit, with leaves 1-6mm wide, dull yellow green, sparsely hairy. Long ligule with hairs around base. Base of plant smells of vanilla. (*Anthoxanthum odoratum*) (K, L)



Spikelets held in branched panicle (2)

2. Spikelets white to pink, feel soft; 1 awn per spikelet, glumes hairy. Panicle often appearing somewhat spike-like, but spreading when older or teased apart. Leaves flat and pointed.

- Plant hairy all over, feels soft, leaves 6-10 mm wide. Leaf sheaths often pink-tinged. Spikelets also hairy, awn usually concealed within florets. Short ligule (1-4 mm). Tufted growth habit (*Holcus lanatus*) (M, N)



- Plant only hairy at nodes, sometimes with sparse hairs on leaves, which are typically 2-8 mm wide, very smooth to the touch. The ligule is longer, to 5 mm. Awns 3.5-5 mm, visibly protruding from spikelets. Plant flowering rarely, appearing mostly as creeping tillers. (*Holcus mollis*) (O, P)



Spikelets silvery to purple; glumes and lemmas membranous giving a shiny effect in bright light. Lemmas with bent awns; plant usually tufted.

- Leaves very narrow, bristle-like (0.5 mm wide), dark green, with purplish sheathes; panicle branches wavy. Awns 4 – 7 mm. (*Deschampsia flexuosa*) (Q)
- Leaves to 5 mm wide, tough, grooved, very rough if stroked toward stem. Plant growing in large, dense tufts to 120 cm tall. Awns 4 mm long. Long pointed ligule. (*Deschampsia cespitosa*) (R)



Spikelets minute, awnless, with only one floret, each held on an individual branch, giving the inflorescence a fine appearance. Ligule present, different size in different species. Leaves 3-5.5 mm wide. (*Agrostis* spp.) (S)

Spikelets laterally compressed, with glumes and lemmas 'keeled' like the base of a boat. Leaf tip looks like the front of a boat (this can be confirmed by pressing the leaf between thumb and finger and sliding toward the end; a distinct thickness can be felt); leaves 2-3 mm wide. (*Poa* spp.) (T)

