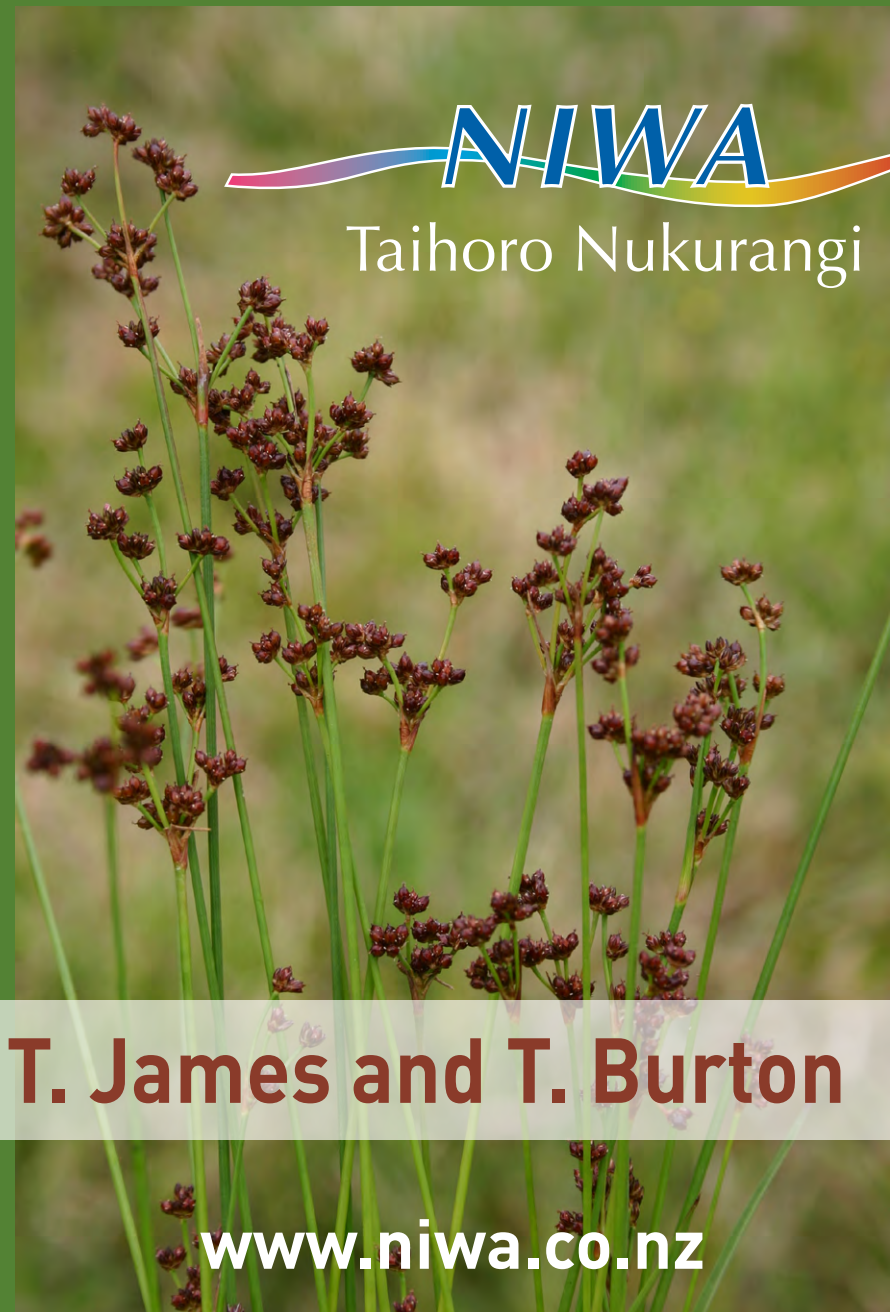


New Zealand Rushes: *Juncus* factsheets

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Introduction

Rushes (family Juncaceae) are a common component of New Zealand wetland vegetation and species within this family appear very similar. With over 50 species, *Juncus* are the largest component of the New Zealand rushes and are notoriously difficult for amateurs and professionals alike to identify to species level.

This key and accompanying factsheets have been developed to enable users with a diverse range of botanical expertise to identify *Juncus* to species level. The best time for collection, survey or identification is usually from December to April as mature fruiting material is required to distinguish between species. Factsheets (hyperlinked and available on the NIWA website) developed for each species provide more detailed information on descriptions for both native and exotic species, distribution within New Zealand, habitat, similar species and photographs of key features.

We hope you find the key and factsheets useful and would welcome any feedback via the NIWA website, or to us directly, kerry.bodmin@niwa.co.nz or paul.champion@niwa.co.nz.

Using this key

In preparing this key and factsheets we have used everyday language and have kept botanical terms to a minimum. Any technical terms have an alternative, plain English wording and are identified on accompanying photographs or images. Each step of this key involves two choices, each described and illustrated with image(s) of the characteristic in question. It is therefore important to have mature, fruiting material to use this key.

With your specimen in hand, the first part of this key determines if your specimen is indeed a *Juncus* or one of the other three genera in the Juncaceae family present in New Zealand. The second part of the key breaks the genus *Juncus* down into five sections. The third and final part of the key determines species identification and provides a hyperlink to the species factsheet.

Taxonomic treatment of *Juncus* in this key generally follows the family monograph by Kirschner (2002). Species features and descriptions were taken from Kirschner (2002), as well as the New Zealand Flora volume III (Healy & Edgar, 1972).

Healy AJ, and Edgar E (1980) Flora of New Zealand Volume III: Adventive Cyperaceous, Petalous & Spathaceous Monocotyledons. Botany Division, Department of Scientific and Industrial Research, P. D. Hasselberg, Government Printer, Wellington New Zealand. 220 p.

Kirschner J et al. (2002) *Juncaceae 3: Juncus subg. Agathryon, Species Plantarum: Flora of the World* Part 7 (336 p.) and Part 8 (192 p). Australian Biological Resources Study, Canberra.



Genus-species: *Juncus acuminatus*

Authority: Michx., 1803

Subordinate taxa: -

Synonyms and authority: -

Common name: sharp-fruited rush

Section: Ozophyllum

Threat status (2012): Naturalised

NZ distribution: Common throughout the North Island and northern South Island, usually lowland

Habitat: Margins of flowing and still water bodies, drains and wet pasture.

Identification features: Upright leafy rush to 80 cm tall. Plant reddish in colour. **Leaves:** tubular with internal cross walls (feels like it clicks if you hold base of leaf between finger and thumb and slide up). **Flower heads:** branched and made up of many clusters of 6 to 10 light brown flowers/capsules at the end of branches. **Capsules:** 2.5-3.5 mm long, egg shaped shortly beaked and straw coloured brown. **Tepals:** equal or slightly greater to length of capsule.

Similar species: Similar to other tubular septate leaved rushes, but only *J. acuminatus*, *J. brachycarpus* and *J. canadensis* have have cross walls visible in the stems beneath the flower head. *J. canadensis* has tailed seeds, larger capsules, is more densely upright, lacks the reddish tinged appearance and the leaf sheath is swollen. *J. brachycarpus* has spherical flower heads.



A- habitat, B- whole plant, C- flower heads, D- capsules and tepals, E- cross walls below flower head, F- leaves with externally visible cross walls, G- base of plant.



Genus-species: *Juncus acutiflorus*

Authority: Ehrh. ex Hoffm., 1791

Subordinate taxa: -

Synonyms and authority: -

Common name: sharp-flowered rush

Section: Ozophyllum

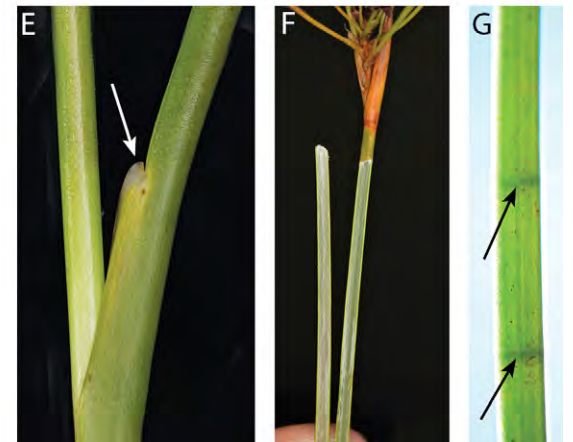
Threat status (2012): Naturalised

NZ distribution: Common in Buller and Westland, also scattered in Central NI, Wairarapa, Canterbury and Southland

Habitat: Drains and wet pasture.

Identification features: Upright leafy rush to 1 m tall. Often found in loose clumps and sometimes extending from rhizome lines. **Leaves:** tubular with internal cross walls (feels like clicks if you hold base of leaf between finger and thumb and slide up) with a small ear-like membrane (auricle) where the leaf joins the stem. **Flower heads:** branched and made up of many small clusters of 3 to 12 red brown flowers/capsules. **Capsules:** ~3mm long, red brown in colour and tapering to a point. **Tepals:** shorter than capsule.

Similar species: Similar to other tubular leaved rushes with cross walls visible in leaves, but forms stiffly erect clumps (the tallest of this group), many branched with many few flowered clusters of sharp tipped red-brown capsules.



A- whole plant, B- branched flower heads, C- capsules and tepals, D- flower heads, E- small ear-like membrane (auricle) visible where leaf joins to stem, F- no cross walls visible below flower heads, G- leaves with visible cross walls.



Genus-species: *Juncus acutus*

Authority: L., 1753

Subordinate taxa: -

Synonyms and authority: -

Common name: sharp rush

Section: Juncus

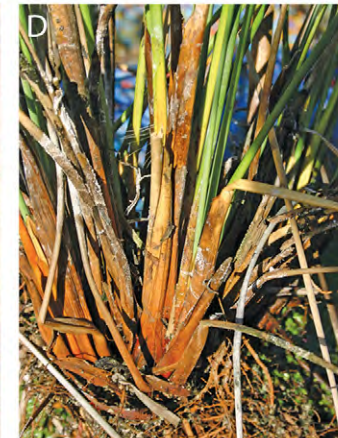
Threat status (2012): Naturalised

NZ distribution: Coastal areas in Northland, Auckland, Waikato and Manawatu

Habitat: Wet and seasonally dry sandy areas.

Identification features: A prickly upright rush forming dense clumps up to 1 m tall. Stems are round in shape, smooth and light green in colour. **Leaves:** look similar to stem, are round and have a very sharp point. **Flower heads:** in a dense cluster near the end of each stem. **Capsules:** large, 4.5-5 mm long, egg shaped and reddish-brown to brownish-orange in colour. Seeds have distinct tails. **Tepals:** much shorter than capsule.

Similar species: No other rush has a combination of leaves similar to the stem with sharp pointed tips and large (> 4 mm) red-brown to orange capsules in a dense clustered head. All Juncus in the section Juncotypus have leaves reduced to basal sheaths whereas Juncus in the section Juncus (*J. acutus* and *J. kraussii*) have leaves similar to stems.



A- habitat, B- flower heads, C- capsules and tepals, D- base of plant, E- sharply pointed stem tip, F- stems and leaves are the same, only stems have flower heads at the tip.



Genus-species: *Juncus amabilis*

Authority: Edgar, 1964

Subordinate taxa: -

Synonyms and authority: -

Common name: -

Section: Juncotypus

Threat status (2012): Naturalised

NZ distribution: Scattered in Auckland, Hawkes Bay, Wairarapa, Canterbury and Oamaru

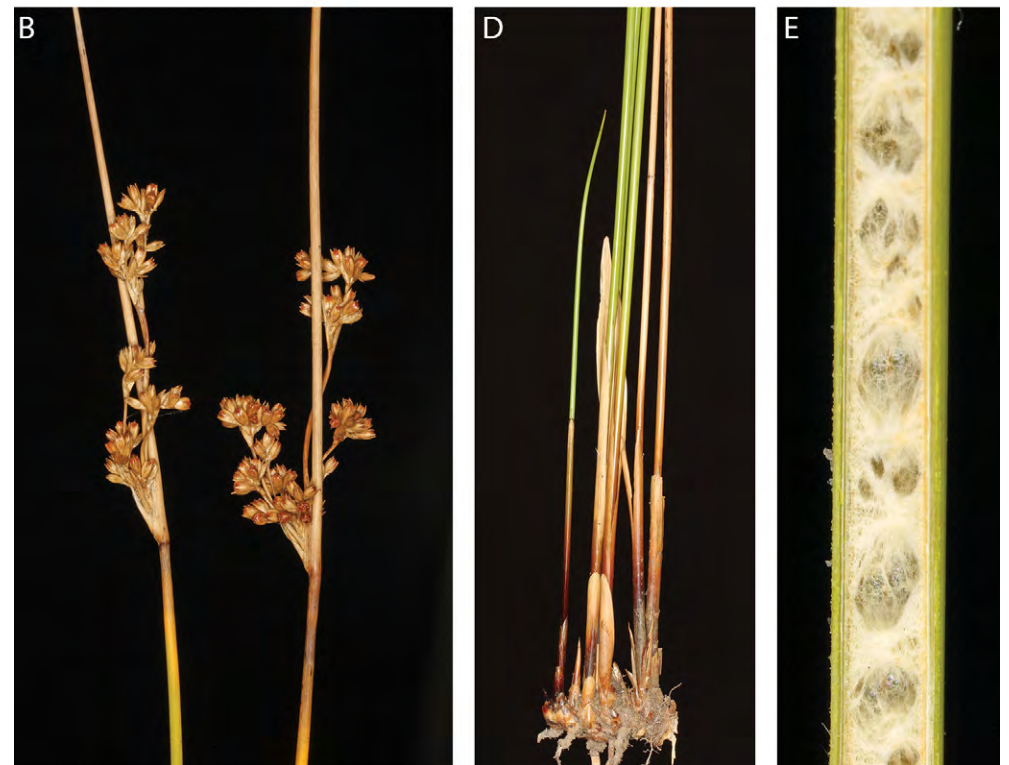
Habitat: Damp places along water body margins and waste land.

Identification features: Leafless rush up to 1.2 m tall, with grey green stems, 1-2.5 mm diameter.

Leaves: absent, reduced to basal sheaths which are very dark red-brown or black, glossy at the base.

Pith: when stem is split length ways, pith has distinct holes. **Flower heads:** on side of stem, 1-5 cm long, up to five slender branchlets of differing lengths, flowers clustered on the branchlet tips. Capsule 2-2.5 cm long, reddish brown. **Tepals:** less than length of capsule.

Similar species: Similar to other leafless rushes, most similar to *J. procerus*, which also has interrupted pith and glossy dark leaf sheath bases, but is much larger with stems up to 1.5 m tall and 3.5-8 mm diameter, flower head to 10 cm long, many branched.



A,B- flower heads, C- capsules and tepals, D- basal sheaths and stems, E- interrupted pith.



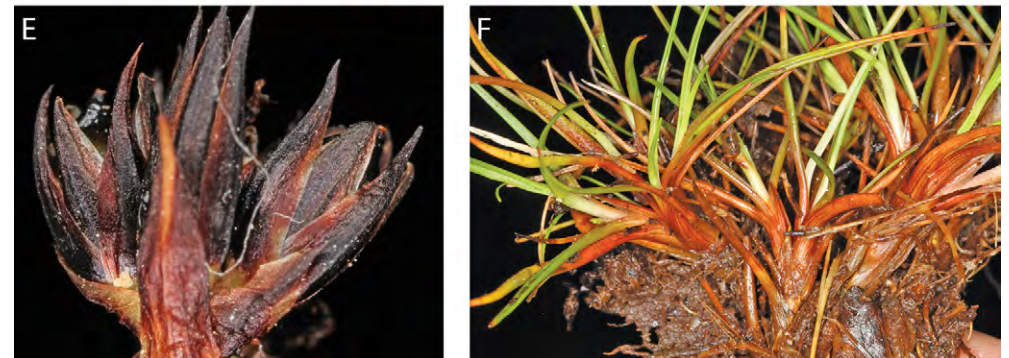
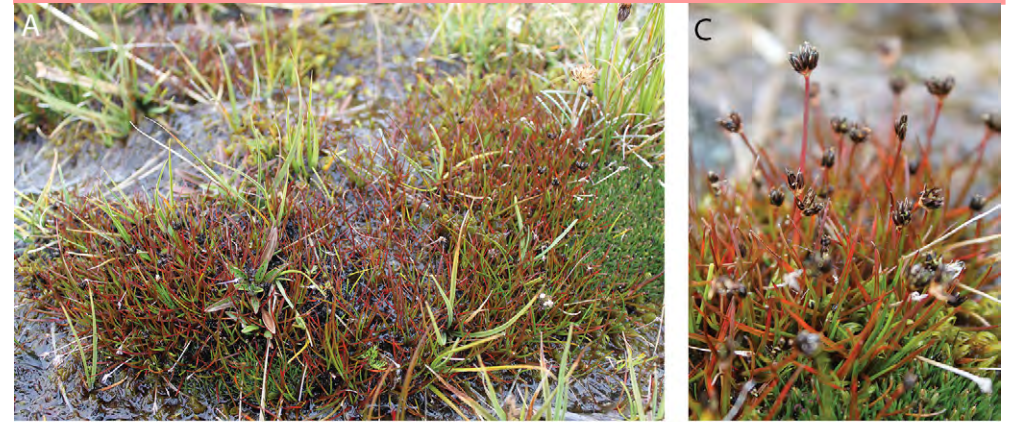
- Genus-species:** *Juncus antarcticus*
- Authority:** Hook.f., 1844
- Subordinate taxa:** -
- Synonyms and authority:** *Juncus brevifolius* sensu Kirk (1882) (nom. inv.), *Juncus pauciflorus* sensu Kirk (1877) (nom. inv.)
- Common name:** dwarf rush
- Section:** Graminifolii
- Threat status (2012):** Native, non threatened

NZ distribution: Alpine areas in the North and South Island. In South Island also extending to sea level in Otago and Southland. Also found on subantarctic islands.

Habitat: Margins of flowing and still water bodies, drains and wet pasture.

Identification features: A small bright green tufted rush growing up to 12 cm tall. **Leaves:** grow from the base and are fleshy tapering to a point. **Flower heads:** are single (rarely double) and form at the end of branches. 2-10 flowers in each cluster. **Capsules:** ~3mm, egg shaped and black. **Tepals:** same length as capsule.

Similar species: Similar to *J. novae-zelandiae* with which it may grow. It differs by having no cross-walls in leaves, dark maroon to black tepals rather than red or greenish brown and 3-6 stamens instead of consistently 6 stamens. Its small stature, and usually single flower means that it can look similar to *J. lomatophyllus*, *J. caespiticus* and *J. capitatus* species but differs by its channelled leaves; except for *J. caespiticus* which is much larger and usually coastal and *J. capitatus* which differs by its usually reddish tepals which are much longer than the length of its capsules.



A- habitat, B- whole plant, C,D - flower heads, E- capsules and tepals, F- leaves and basal sheaths.



Genus-species: *Juncus anthelatus*

Authority: (Wiegand) R.E.Brooks, 1999

Subordinate taxa: -

Synonyms and authority: *Juncus tenuis* var. *anthelatus* Wiegand (1900), *Juncus tenuis* subsp. *anthelatus* (Wiegand) F.Verloove & J.Lambinon (2011)

Common name: -

Section: Steirochloa

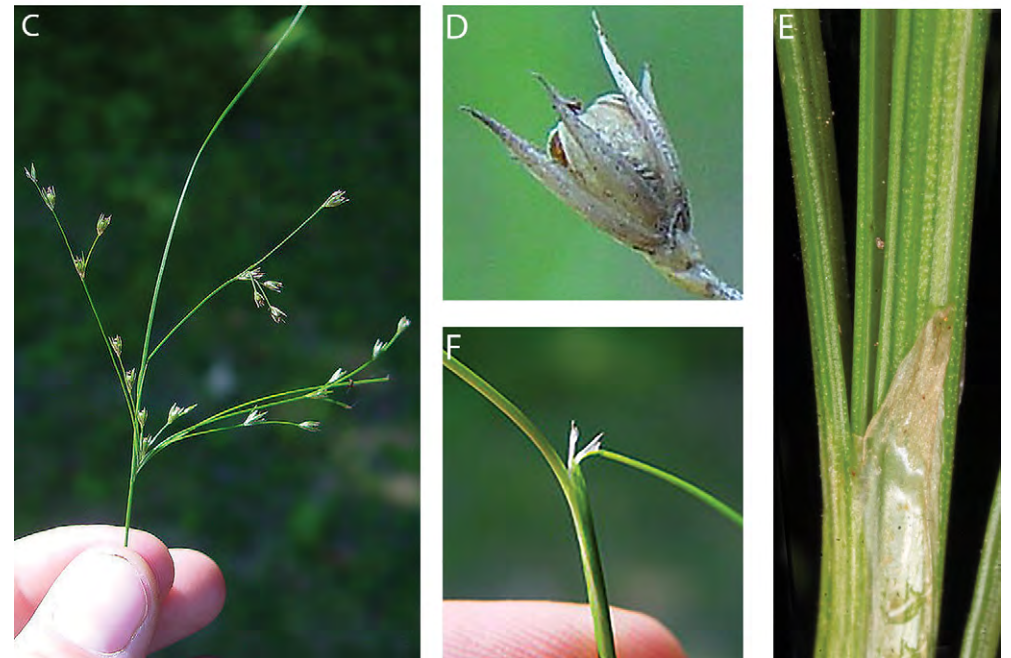
Threat status (2012): Naturalised

NZ distribution: Northland, Auckland, Bay of Plenty, Waiouru, Wellington, Wairarapa and Chatham Is

Habitat: Open or partially shaded disturbed sites in moist or seasonally wet sandy or clay soils, often on pathways

Identification features: Stiffly upright tufts growing up to 90 cm tall. **Leaves:** slender but tough (wiry), with ear shaped lobes (auricles) present at the leaf base. **Flower heads:** open, many branched (5-20 cm long) with up to 100 flowers arranged singly on branches. **Capsules:** 2-3.2 mm long. **Tepal:** much longer than the length of capsule.

Similar species: Very similar to *J. tenuis*, but *J. tenuis* is shorter, has flowers produced in clusters and capsule greater than 3/4 length of tepals.



A- habitat, B&C- flower heads, D- capsules and tepals, E&F- ear-like membrane (auricle) present at base of leaf. (Images C & F taken by Donald Cameron, <https://gobotany.newenglandwild.org/>; Images A&D © Arthur Haines, New England Wild Flower Society).



Genus-species: *Juncus articulatus*
Authority: L., 1753
Subordinate taxa: -
Synonyms and authority: *Juncus lamprocarpus* Ehrh. ex Hoffman (1791) (nom. inv.)

Common name: jointed rush

Section: Ozophyllum

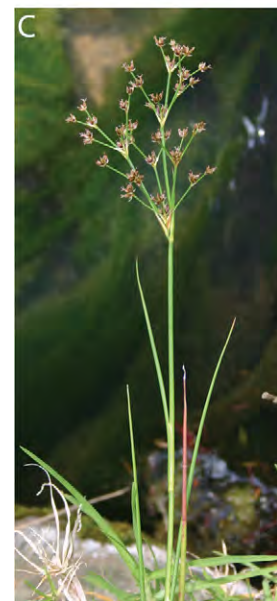
Threat status (2012): Naturalised

NZ distribution: Widespread and common throughout.

Habitat: Margins of flowing and still water bodies, drains and wet pasture, sometimes submerged or floating.

Identification features: Sprawling reddish-tinged leafy rush growing in dense or loose tufts up to 80 cm tall. **Leaves:** tubular with internal cross walls (feels like clicks if you hold base of leaf between finger and thumb and slide up), usually bending upwards. **Flower heads:** branched and made up of 4-8 small clusters at branchlet tips. **Capsules:** 2-4mm long, triangular shape with distinct point and glossy dark brown to black in colour. **Tepals:** shorter than capsule.

Similar species: Similar to other tubular leaved rushes with visible cross walls in leaves, but is often sprawling or ascending rather than upright, with acute-tipped dark brown to black capsules longer than the tepals.



A,B- habitat, C-whole plant, D- flower heads, E- capsules and tepals, F- arching stems, G- small ear like membrane (auricle), H- creeping rhizome, I- base of plant with roots and rhizome.



Genus-species: *Juncus australis*

Authority: Hook.f., 1858

Subordinate taxa: -

Synonyms and authority: -

Common name: -

Section: Juncotypus

Threat status (2012): Native, non threatened

NZ distribution: Widespread and common throughout.

Habitat: Drains and wet pasture. Mainly low land.

Identification features: Loose blue-green to grey-green clumps. Stems up to 1.2 m tall with vertical ridges and are often covered in a whitish bloom. **Pith:** when stem is split length ways, pith almost absent. **Leaves:** absent, reduced to basal sheaths that are dull dark yellow-brown to chestnut brown in colour, shiny at base. **Flower heads:** branched and made up of one to several dense clusters. **Capsules:** 2.3 - 3 mm long and pale greenish brown in colour. **Tepals:** equal to or slightly shorter in length than the capsule.

Similar species: None. This species is the only one that is blue-green in colour, has a whitish bloom covering, ridged stems and usually with interrupted to absent pith.



A- habitat, B- whole plant, C- capsules and tepals, D- flower heads, E- stem with vertical ridges, F- pith almost absent, G -basal sheaths.



Genus-species: *Juncus brachycarpus*

Authority: Engelm., 1868

Subordinate taxa: -

Synonyms and authority: -

Common name: -

Section: Ozophyllum

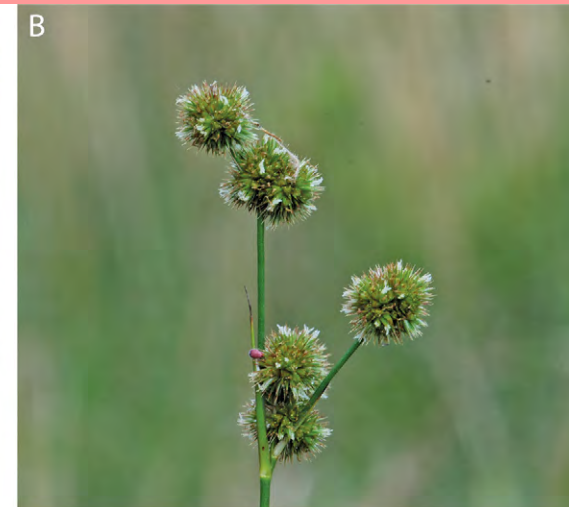
Threat status (2012): Naturalised

NZ distribution: One old collection (1934) from Cape Maria van Diemen

Habitat: The one collection was from a boggy hillside (presumably a seep)

Identification features: Upright tufts to 80 cm tall on a long creeping rhizome. Has distinct cross walls just below the flower head. **Leaves:** tubular with internal cross walls (feels like it clicks if you hold base of leaf between finger and thumb and slide up). **Flower heads:** branched with 2-20 rounded flowerheads (each with 30-100 flowers up to 1 cm across) on upright branches. **Capsules:** 1.7-2.7 mm long with three stamens. **Tepals:** 2-3.8 mm long, longer than length of capsules.

Similar species: Similar to other tubular septate leaved rushes, but only *J. acuminatus*, *J. brachycarpus* and *J. canadensis* have have cross walls visible in the stems beneath the flower head. *J. acuminatus* and *J. canadensis* have septae beneath the flowerhead, but neither have such globose flowerheads.



A- herbarium specimen, B- flower heads, C- stems, D- leaves with visible cross walls, E- creeping rhizome. (Photo A supplied by Allan Herbarium, CHR copyright, Landcare Research. Images B, C, E and that used for the title banner supplied by Larry Allain, USGS, Wetland and Aquatic Research Center, USA).



Genus-species: *Juncus bufonius*

Authority: L., 1753

Subordinate taxa: var. *bufonius*, var. *congestus* Wahlenb. (1820), var. *parviflorus* Aschers. et Graebner (1904).

Synonyms and authority: -

Common name: toad rush

Section: Tenageia

Threat status (2012): Naturalised

NZ distribution: Widespread and common throughout.

Habitat: Open disturbed sites, from dry to wet, sandy to clay, including gardens, cultivated land, ditch banks, gutters and road verges.

Identification features: Small tufted and bushy rush up to 15 cm tall. Either light green, or reddish in colour in open sites. Easily pulled from the soil. Much of the mature plant (often 2/3) is comprised of the flower head. **Leaves:** soft, hair-like, mostly basal. **Flower heads:** widely branched with flowers either individual or in 2-7 flowered clusters. **Capsules:** 3 mm. **Tepals:** slightly longer than capsules. **Note:** There are three varieties recognised in New Zealand: var. *bufonius*, flowers are solitary in the flower head, tepals 4-6-(8mm) long; var. *congestus*, flowers are grouped in clusters of 2 - 7, tepals are 6-9mm long; and var. *parviflorus*, flowers are solitary in the flower head, tepals 4mm long.

Similar species: Most similar to *J. tenuis*, but *J. tenuis* is hard to pull from the soil and has a smaller flower head (less than 2/3 of the plant). *J. capitatus* is easy to pull up, but this has a single (rarely 2 or 3) flowerhead of 3-8 flowers, and channelled leaves.



A- habitat, B- whole plant, C- flower head, D- capsules and tepals, E- whole plant (var. *parviflorus*), F- stem with leaf (right).



Genus-species: *Juncus bulbosus*

Authority: L., 1753

Subordinate taxa: -

Synonyms and authority: -

Common name: bulbous rush

Section: Ozophyllum

Threat status (2012): Naturalised

NZ distribution: Widespread and common throughout.

Habitat: Mostly peaty sites in wet pastures, water body margins, drains and wetlands, sometimes submerged.

Identification features: A small dense and fine-leaved red-tinged rush growing in tufts up to 15 cm tall with a distinctive swollen (bulbous) base. Sometimes mat forming and can grow submerged in lakes. **Leaves:** very fine with internal cross walls visible in leaves. **Flower heads:** branched and made up of many small clusters of 2 to 6 yellow-brown flowers/capsules on end of branchlets. Occasionally tufts of leaves can be found on flowers. **Capsules:** 2-3 mm long, oblong and yellowish-brown. **Tepals:** of similar length to capsule.

Similar species: In submerged habitats maybe confused with *J. bufonius*, but its distinctive bulb like base and leaves with cross walls distinguish it from *J. bufonius*.



A- habitat, B- whole plant, C- flower heads, D- prostrate rooting stems with leafy tufts, E- capsules and tepals, F- stems, G- swollen (bulbous) base.



Genus-species: *Juncus caespiticicus*

Authority: E.Mey., 1846

Subordinate taxa: -

Synonyms and authority: -

Common name: grass-leaved rush

Section: Graminifolii

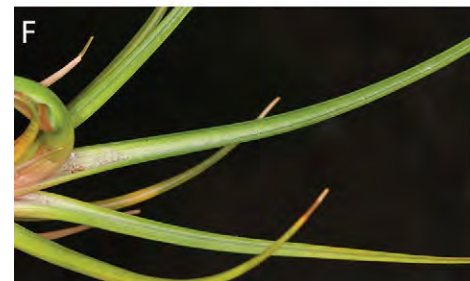
Threat status (2012): Native, non threatened

NZ distribution: Widespread and common throughout.

Habitat: Usually coastal. Growing in damp seepages, or on steep damp cliff faces. Occasionally in dune swales or around the margins of streams.

Identification features: A pale green grass like rush forming leafy tufts with stems between 10-30 cm tall. Can form circular patches up to 10 cm in diameter. **Leaves:** broad at the base and stiff and arching (not flat). Base often pink-coloured. **Flower heads:** usually a single round cluster (sometimes more than one) at the end of stems with a long leaf like extension (bract) above this. **Capsules:** oval, reddish-brown, and more or less equal in length to tepals.

Similar species: Distinguished from *J. planifolius* and *J. lomtophyllus* by the flower head which is usually a single, spherical shaped head with the plant having broadly arched leaves. Also similar to *J. sonderianus* from which it differs in usually having a single flower head rather than 1-3 flower heads, and tepals more or less equal to capsule length rather than tepals longer than capsules.



A- habitat, B- whole plant, C- flower heads, D- capsules and tepals, E- modified leaf (bract) longer than flower head, F- leaves, G- stem.



Genus-species: *Juncus canadensis*

Authority: J.Gay ex Laharpe, 1827

Subordinate taxa: -

Synonyms and authority: -

Common name: tail-seeded rush

Section: Ozophyllum

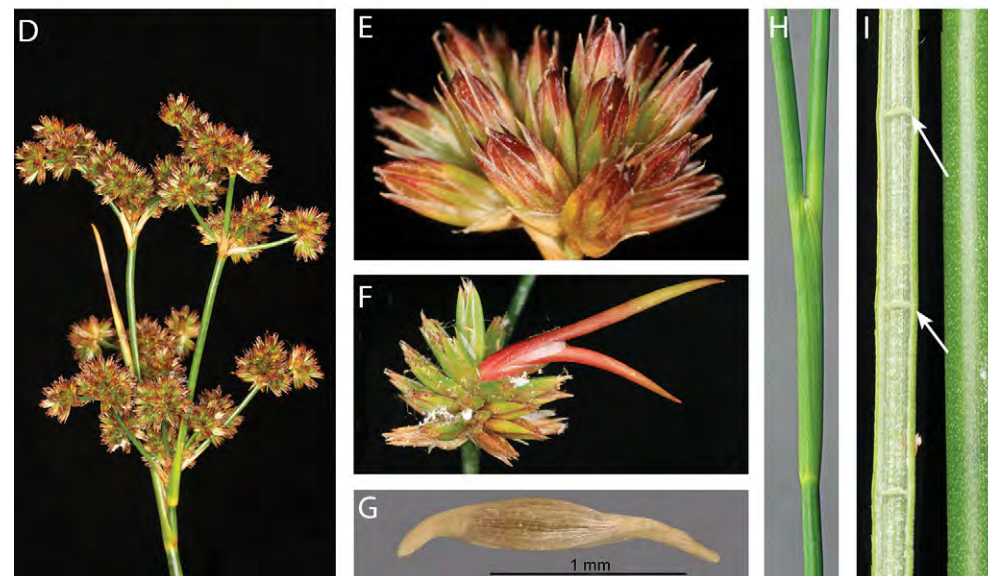
Threat status (2012): Naturalised

NZ distribution: Most common in Buller and Westland but also scattered in Canterbury, Central NI and Bay of Plenty

Habitat: Swamps, wet pasture, gravels and drains.

Identification features: Stiffly upright bright green leafy rush to 90 cm tall. Leaves round with internal cross walls (feels like clicks if you hold base of leaf between finger and thumb and slide up). Leaf sheath is swollen near the junction with the leaf blade. **Flower heads:** branched and made up of many clusters of 5 to 20 pale brown flowers/capsules. **Capsules:** 3-4.5 mm long, pale brown and have a narrow short beak. **Tepals:** equal to or slightly shorter in length than the capsule. **Seeds:** with distinct tails at each end.

Similar species: Similar to other tubular septate leaved rushes, but only *J. acuminatus*, *J. brachycarpus* and *J. canadensis* have have cross walls visible in the stems beneath the flower head. *J. acuminatus* does not have tailed seeds, has smaller capsules and is usually reddish tinged not bright green. *J. brachycarpus* has spherical flowerheads.



A- habitat, B- whole plant, C- immature flower heads, D- mature flower heads, E- capsules and tepals, F- flower head showing leafy tufts emerging, G- tail on seed, H- swollen leaf sheath, I- stems have visible cross walls below flower head.



Genus-species: *Juncus capitatus*

Authority: Weigel, 1772

Subordinate taxa: -

Synonyms and authority: -

Common name: dwarf rush

Section: Caespitosi

Threat status (2012): Naturalised

NZ distribution: Northland and northern Auckland south to Tomarata

Habitat: Roadsides, sandy pasture and lake margins

Identification features: Leafy, short pale green rush growing in tufts. **Leaves:** stiff and arching with inrolled margins, 10-15 cm long, pointed but wider at base. **Flower heads:** usually single with one round flower head with a long leaf like extension (bract) above this. Flower stems 10-30 cm tall.

Capsules: egg shaped and red-brown in colour. **Tepals:** same length as capsule.

Similar species: Superficially like *J. bufonius*, but this species has large open flower heads compared with the clustered heads of *J. capitatus*.



A- habitat, B - flower heads, C- whole plant, D- capsules and tepals, E- bract extending from flower head, F- leaves.



Genus-species: *Juncus conglomeratus*

Authority: L., 1753

Subordinate taxa: -

Synonyms and authority: -

Common name: soft rush

Section: Juncotypus

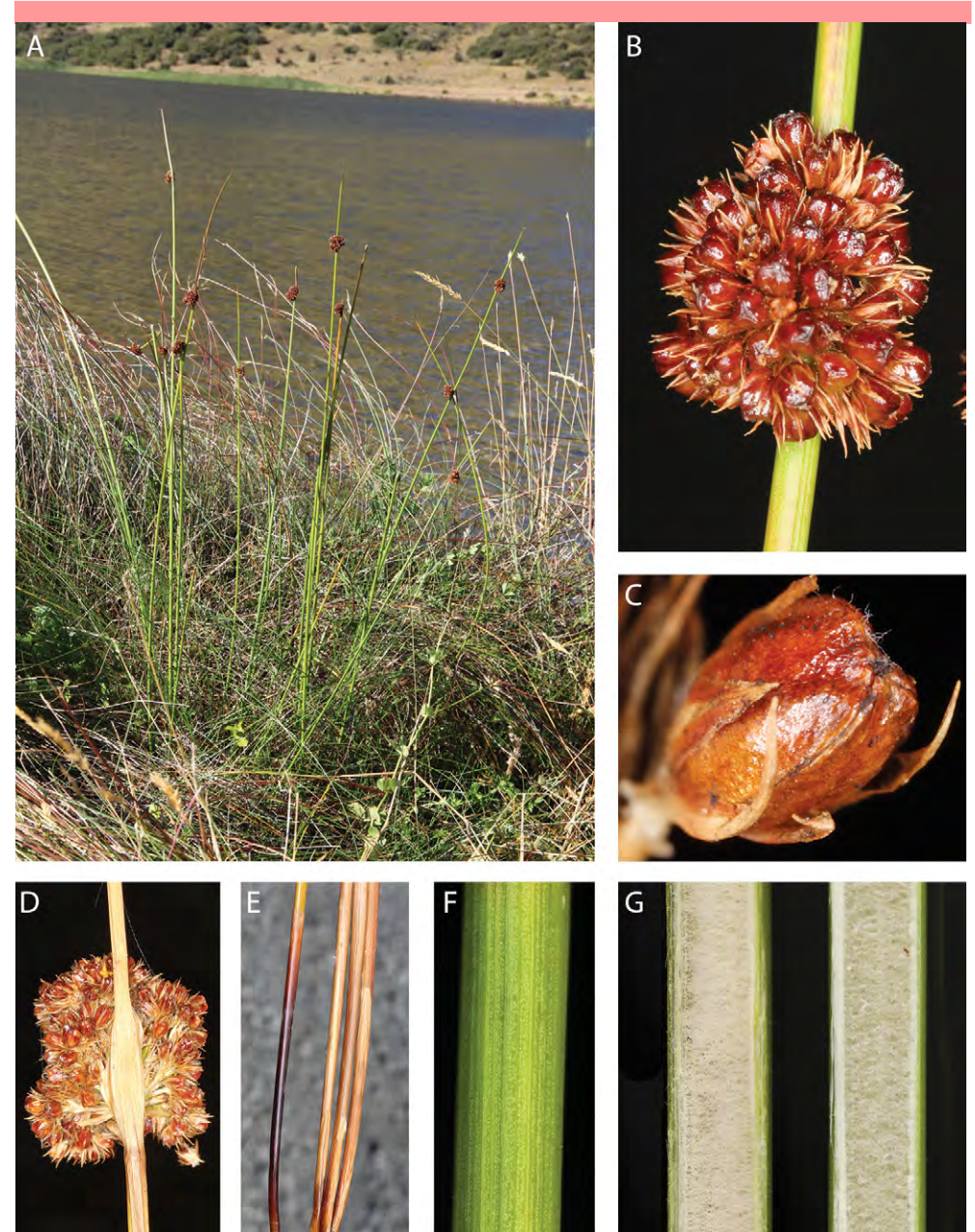
Threat status (2012): Naturalised

NZ distribution: Scattered throughout the SI

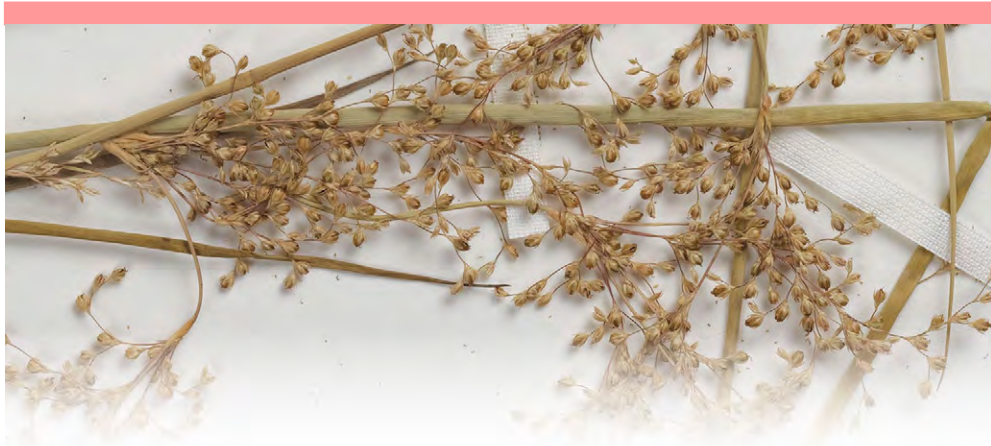
Habitat: Lake margins, roadside drains and wet pasture.

Identification features: Upright clump-forming leafless rush to 80 cm tall, with tall cylindrical stems with visible ridges. **Leaves:** absent. **Pith:** when stem is split length ways, pith is entire with no obvious holes. **Flower heads:** single and tightly clustered, 10 mm across, near the end of each stem, made up of many reddish-brown flowers. Stem is swollen behind the flower head. **Capsules:** flattend at top and are a shiny reddish brown. **Tepals:** pale with a brown central stripe, and shorter than length of capsule.

Similar species: Similar to other tall leafless rushes but has a dense single flower cluster. Most similar to *J. effusus* var. *compactus* from which it differs with a swelling of the stem behind the flower head and conspicuous ridges on the stem beneath the flower head.



A- habitat, B - flower head, C- capsule and tepals, D- swollen modified leaf (bract) behind flower head, E- basal sheaths, F- stems with visible ridges, G- continuous pith.



Genus-species: *Juncus continuous*

Authority: L.A.S.Johnson, 1978

Subordinate taxa: -

Synonyms and authority: -

Common name: -

Section: Juncotypus

Threat status (2012): Naturalised

NZ distribution: Lake Rotokawau near Sweetwater (North of Kaitaia), more recent from Auckland City and Great Barrier Is

Habitat: Moist sandy soil, e.g. lake margins

Identification features: Leafless rush up to 1.4 m tall, with 1.2-3 mm diameter stems, bright yellow green, soft, continuous pith. **Leaves:** absent, reduced to basal sheaths that are yellow brown and glossy at the base. **Flower heads:** open with, branchlets of differing lengths, flowers mostly evenly distributed along branchlets. Capsule 2.3-2.8 mm long, dark golden brown. **Tepals:** shorter than length of capsule.

Similar species: Similar to other leafless rushes, vegetatively most similar to *J. effusus*, which also has bright green stems with soft cobwebby pith, but has light straw to pale brown basal sheaths, and a downward pointing lowest flower head branch.



Herbarium images. A&B- whole plant , C- flower heads, D- capsules and tepals. (Images supplied by Allan Herbarium, CHR copyright, Landcare Research) .



Genus-species: *Juncus dichotomus*

Authority: Elliott, 1817

Subordinate taxa: -

Synonyms and authority: *Juncus tenuis* subsp. *dichotomus* (Elliott) F.Verloove & J.Lambinon (2011), *Juncus tenuis* var. *dichotomus* (Elliott) Alph. Wood (1864), *Juncus platyphyllus* (Weigand) Furnald (1945)

Common name: -

Section: Steirochloa

Threat status (2012): Naturalised

NZ distribution: Common in northern North Island, scattered further south to Wairarapa.

Habitat: Open areas including seasonally wet, usually sandy soils such as grassland, lake shores, drains and road verges.

Identification features: Stiffly upright tufts growing up to 60 cm tall. **Leaves:** much shorter than stems, rigid, rounded, channelled or nearly flat, with short ear shaped lobes (auricles) at base. **Flower heads:** rigid and only sometimes upright (4-10 cm long) with many flowers arranged singly on branchlets, with a single slender leaf like appendage of similar length exceeding length of each flower head. **Capsules:** 3 mm long, shiny light brown. **Tepals:** similar or longer in length than the capsule.

Similar species: Similar to *J. tenuis*, but this species has less upright and slender leaves, with long membranous auricles and bracts exceeding the flower head.



A- habitat and whole plant, B- flower heads, C- capsules and tepals, D- basal sheaths, E- leaf with ear-like membrane (auricle) at base.



Genus-species: *Juncus distegus*

Authority: Edgar, 1964

Subordinate taxa: -

Synonyms and authority: -

Common name: two-tiered rush

Section: Juncotypus

Threat status (2012): Endemic, non threatened

NZ distribution: Widespread and common throughout. Also in Chatham Islands.

Habitat: Often fringing swamps, and in cloud forest common along board walks. Also in drier hill country and in tussock grassland. Tending to favour poorly drained clay soils.

Identification features: Small, stiff clumps with wiry (tough) dull green or reddish stems. **Pith:** when stem is split length ways, pith has small distinct holes. **Leaves:** absent. **Flower heads:** two small clusters 10mm wide, one pressed to side of stem and the other at the end of a longer, slender, branchlet. **Capsules:** 2.5-3 mm long, broad and shiny chestnut-brown, often with very dark brown tip. **Tepals:** often shorter in length than capsule.

Similar species: *J. filicaulis*, which differs by having flower heads usually in a single cluster, and capsules more or less equal in length rather than greater than the tepals. The stems of *J. filicaulis* are blue or grey-green rather than green to red-green.



A- habitat, B- flower heads, C,D- capsules and tepals, E- stems, F- interrupted pith, G- basal sheaths.



Genus-species: *Juncus edgariae*

Authority: L.A.S.Johnson & K.L.Wilson, 2001

Subordinate taxa: -

Synonyms and authority: *Juncus gregiflorus sensu* Moore & Edgar (1970) (nom. inv.)

Common name: Edgar's rush

Section: Juncotypus

Threat status (2012): Endemic, non threatened

NZ distribution: Widespread in the North, South, Stewart and Chatham Islands.

Habitat: Coastal to alpine. Usually in open shrubland, gringing wetlands and in seasonally damp sites. Often found invading pasture and in urban areas.

Identification features: A variable tussock growing up to 2.5 m tall. Stems erect and tough with modified leaves (bracts) forming at the base. Colours range from dark-green, orange-green to red-green (drying to a glossy yellow-green). **Pith:** when stem is split length ways, pith has distinct holes. **Leaves:** absent. **Flower heads:** branching with small variable clusters of flowers at branch tips. **Capsules:** 1.5-2.3 mm long, egg-shaped and blunt. **Tepals:** equal to or longer in length than the capsules.

Similar species: Similar to *J. continuus* but differs by the usually interrupted bright white, dense stem pith and capsules that are less than or more or less equal in length to the tepals.



A- habitat, B- flower heads, C- capsules and tepals, D- stem, E- interrupted pith, F- basal sheaths.

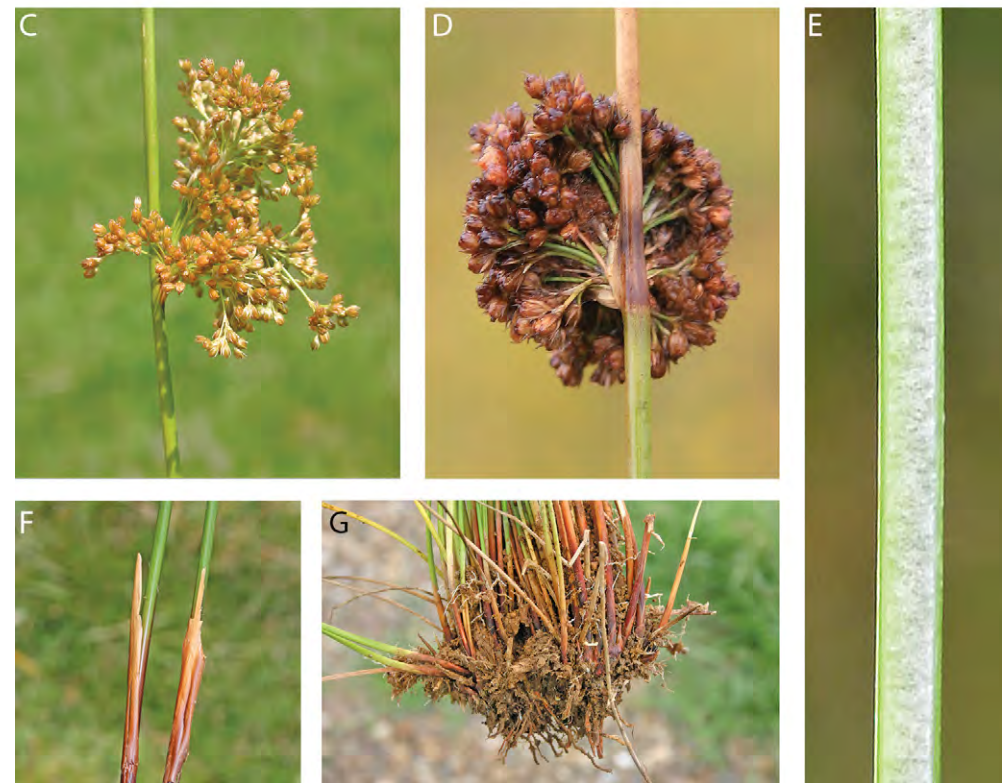


- Genus-species:** *Juncus effusus*
- Authority:** L., 1753
- Subordinate taxa:** var. *effusus*, var. *compactus* Lej. et Courtois (1831)
- Synonyms and authority:** *Juncus communis* E.Mey. (1819) (nom. illegit.), *Juncus luxurians* Colenso (1886)
- Common name:** soft rush
- Section:** Juncotypus
- Threat status (2012):** Naturalised
- NZ distribution:** Widespread and common throughout.

Habitat: Wet pasture and a wide range of wet habitats, including peaty areas.

Identification features: Upright clump-forming leafless rush to 1.2 tall, with tall tubular stems. Stems tapering from a broad base and are smooth, shiny and are dark to yellow-green in colour. Easily broken or compressed between finger and thumb. **Pith:** when stem is split length ways, pith is continuous (without holes) and spongy. **Leaves:** absent. **Flower heads:** branched with many evenly dispersed flowers clustered near the end of each stem. Made up of many light brown flowers/capsules. **Capsules:** 2-3 mm long, oval, flattened on top and a shiny pale brown. **Tepals:** usually longer than length of capsule. **Note:** In New Zealand there are two varieties of *J. effusus*. *J. effusus* var. *compactus* has a densely crowded, round flowerhead.

Similar species: Similar to other tall leafless rushes, but has an open flower head with the lower branches drooping down, no expansion of stem behind the flower head and cobwebby continuous pith in the stem. Most similar to *J. conglomeratus* which has a swelling of the stem behind the flower head and ridges on the stem below the flower head. Also similar to *J. continuus* which differs in the lowest flower head branches do not point downward.



A- habitat, B- whole plant, C- flower head of *J. effusus* var. *effusus*, D- flower head of *J. effusus* var. *compactus*, E- continuous pith, F- basal sheath, G- base of plant.



Genus-species: *Juncus ensifolius*

Authority: Wikstr., 1823

Subordinate taxa: -

Synonyms and authority: -

Common name: iris-leaved rush

Section: Iridifolii

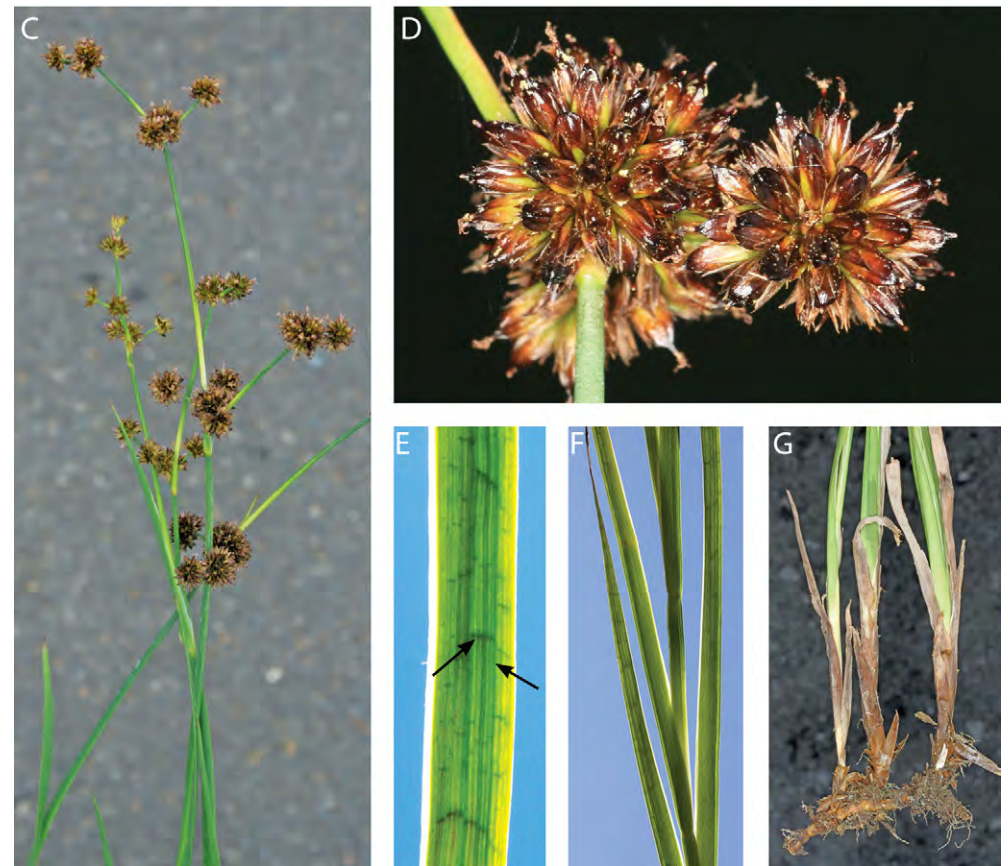
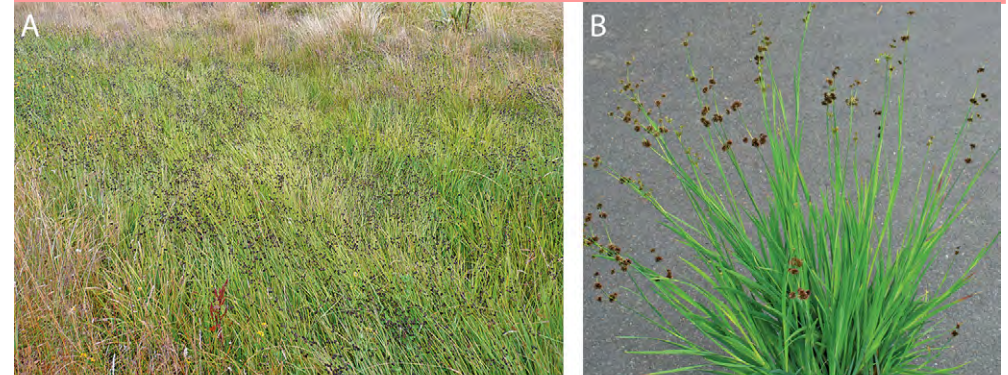
Threat status (2012): Naturalised

NZ distribution: Rotorua and Pureora south to Westland and Canterbury

Habitat: Swampy roadsides and riverine wetlands.

Identification features: An upright blue-green, loosely tufted rush growing up to 70 cm tall with long creeping rhizomes. **Leaves:** flattened and iris-like (sword-shaped), with prominent vertical and horizontal veins. **Flower heads:** 1 to 3 large spherical shaped flowerheads made up of many dark-brown to black flowers/capsules. **Capsules:** ~3 mm long, oblong and dark brown to black. **Tepals:** shorter than the length of capsules.

Similar species: *J. prismatocarpus* which has many-branched flower heads with green or pink flower clusters and tends to be more clump forming.



A- habitat, B- whole plant, C- flower heads, D- capsules, E- leaves with vertical and horizontal cross walls, F- leaves, G- leaf base and creeping rhizome.



Genus-species: *Juncus filicaulis*

Authority: Buchenau, 1904

Subordinate taxa: -

Synonyms and authority: -

Common name: -

Section: Juncotypus

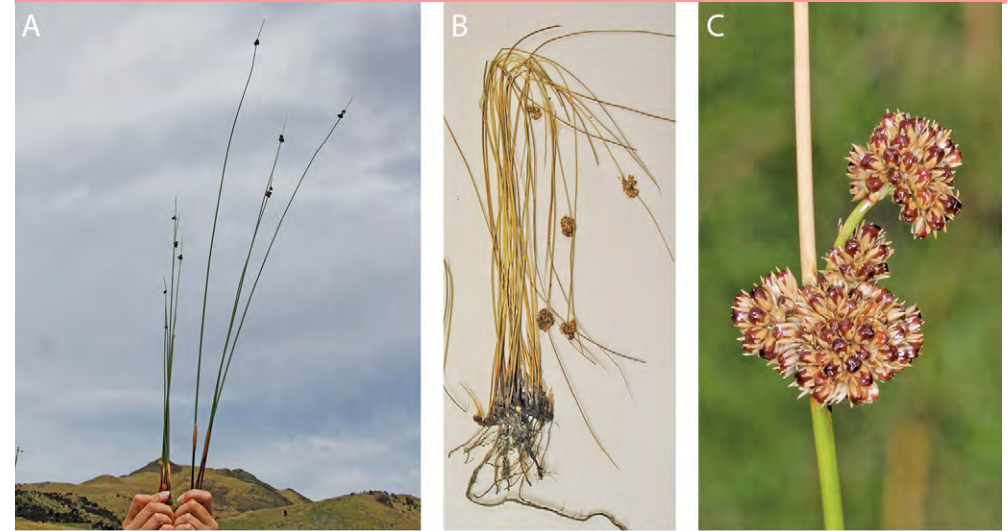
Threat status (2012): Naturalised

NZ distribution: Mostly Canterbury from Banks Peninsula to Hurunui, also Wellington, Marlborough and Otago.

Habitat: Dry hill country grasslands.

Identification features: Very slender leafless rush up to 55 cm tall, with 0.5-1.2 mm diameter stems, grey- or blue-green, hard with obvious ridges. **Pith:** when stem is split length ways, pith has distinct holes. **Leaves:** absent, reduced to basal sheaths which are yellow brown, slightly glossy at base. **Flower heads:** tightly clustered spherical head (rarely with up to 3 lateral clusters). **Capsules:** 2-2.5 cm long, red brown. **Tepals:** similar or just longer in length than capsules.

Similar species: Smaller with hard, very slender stems compared to most other leafless rushes.



A- whole plant with thin stems, B- herbarium specimen of whole plant, C&D- variation in flower head shape, E- capsules and tepals, F- interrupted pith, G- basal sheaths.



Genus-species: *Juncus flavidus*

Authority: L.A.S.Johnson, 1978

Subordinate taxa: -

Synonyms and authority: -

Common name: -

Section: Juncotypus

Threat status (2012): Naturalised

NZ distribution: Mostly Northland and Auckland, scattered elsewhere in NI

Habitat: Roadside and rough, damp pastures.

Identification features: Slender clumped, leafless rush up to 1.2 m tall, with 1.2-3.5 mm diameter stems. **Pith:** when stem is split length ways, pith has distinct holes. **Leaves:** absent, reduced to basal sheaths which are dull yellow to dark golden brown, glossy at the very base. **Flower heads:** open, fan shaped, with branchlets of differing lengths (3-17 cm long), flowers either evenly distributed along branchlets or clustered. **Capsules:** 2-2.8 cm long, golden brown. **Tepals:** longer in length to capsules.

Similar species: Similar to other leafless rushes, distinguished by the fan-shaped flower heads, slender clumps and pale yellow-brown basal sheaths.



A- habitat, B- whole plant , C- flower heads, D- capsules and tepals, E- basal sheaths, F- interrupted pith.



Genus-species: *Juncus fockei*

Authority: Buchenau, 1890

Subordinate taxa: -

Synonyms and authority: -

Common name: -

Section: Ozophyllum

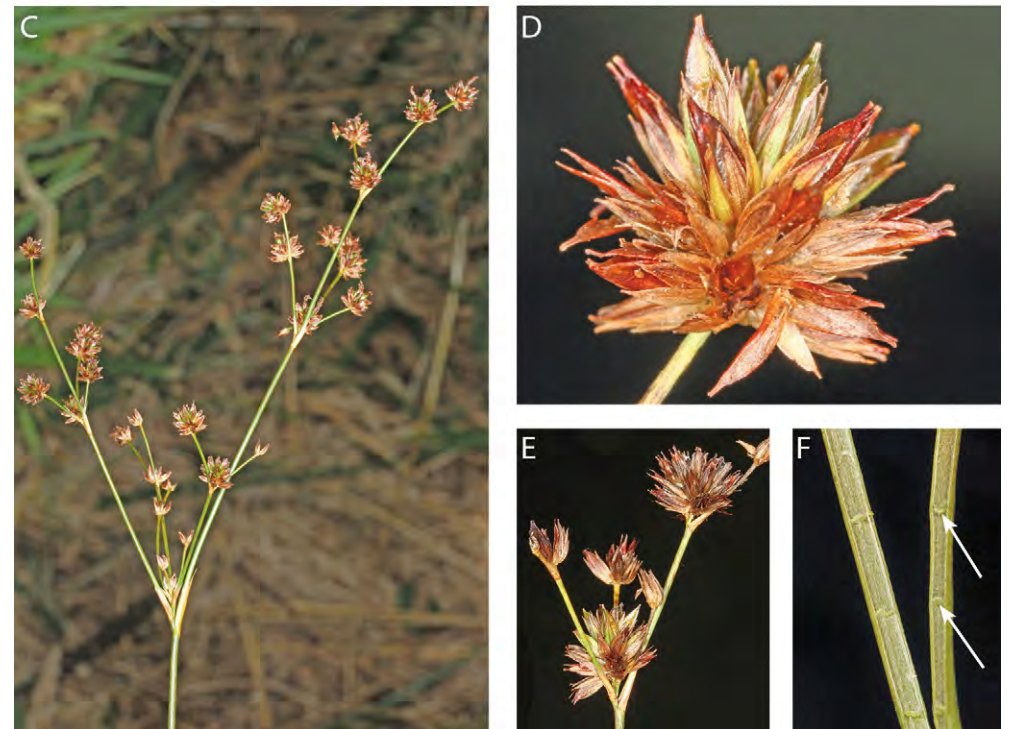
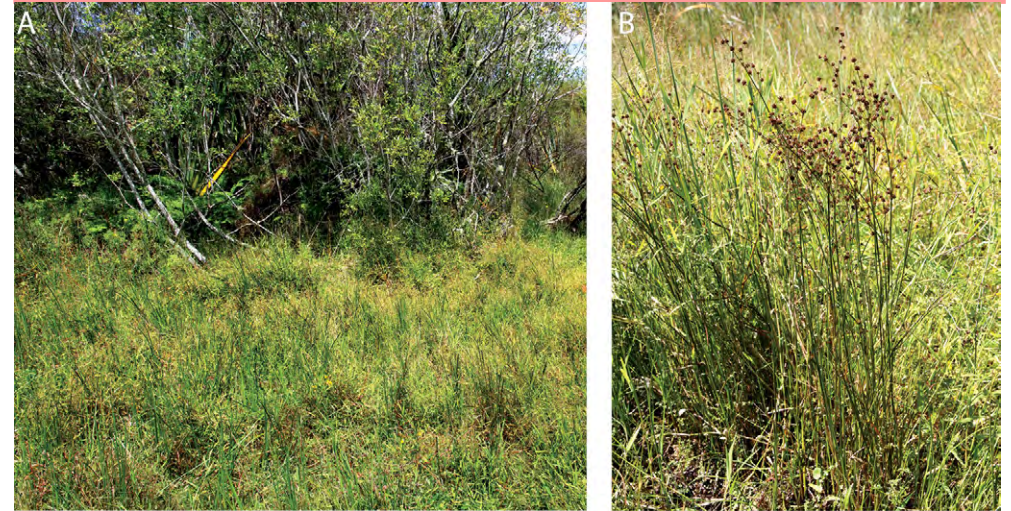
Threat status (2012): Naturalised

NZ distribution: Mostly Waikato and Auckland, scattered further south

Habitat: Most New Zealand plants were found in wet swampy areas.

Identification features: Loosely to densely tufted plants up to 60 cm tall. **Leaves:** slightly flattened with internal cross walls (feels like it clicks if you hold base of leaf between finger and thumb and slide up). **Flower heads:** openly branched with 3-20 almost round flowerheads (each with 5-20 flowers up to 1 cm across). **Capsules:** 4-6 mm long when mature, golden brown or with a chestnut brown tip. **Tepals:** shorter in length to capsules. Note - plants with immature capsules key to *J. holoschoenus* as capsules and tepals are approximately the same length.

Similar species: Most similar to *J. holoschoenus* and *J. prismatocarpus*. Very similar to *J. holoschoenus*, which has capsules similar or less than the length of tepals. Differs from *J. prismatocarpus* in that it has rolled, rather than flat leaves with internal cross walls that extend across the entire leaf width, and flowers with 6 rather than 3 stamens.



A- habitat, B- whole plant, C&E- flower heads, D- capsules and tepals, F- leaves with internal crosswalls.



Genus-species: *Juncus gerardii*

Authority: Loisel., 1809

Subordinate taxa: -

Synonyms and authority: -

Common name: -

Section: Steirochloa

Threat status (2012): Naturalised

NZ distribution: Scattered in coastal sites throughout both North and South Island, also inland in saline influenced wetlands in Otago

Habitat: Restricted to saltmarsh habitats or other salt-influenced habitats inland, where it forms dense grey-green swards.

Identification features: Tufted, sword forming plant to 80 cm tall, with long creeping rhizome. **Leaves:** dull green, channelled, stiff, wiry, up to 20 cm long with small rounded lobes (auricles) visible at the base. **Flower heads:** 2-4 main branches and flowers borne singly along branchlets. **Capsules:** light brown, 3 mm long. **Tepals:** similar or shorter in length of capsules. Tepals dark brown to black, hooded at the tip.

Similar species: Unlike any other species.



A- habitat in circled area, B- whole plant, C- flower heads, D- capsules and tepals, E- leaves, F- ear-like membrane (auricle) visible at base of leaves, G- creeping rhizomes.



Genus-species: *Juncus holoschoenus*

Authority: R.Br., 1810

Subordinate taxa: -

Synonyms and authority: -

Common name: -

Section: Ozophyllum

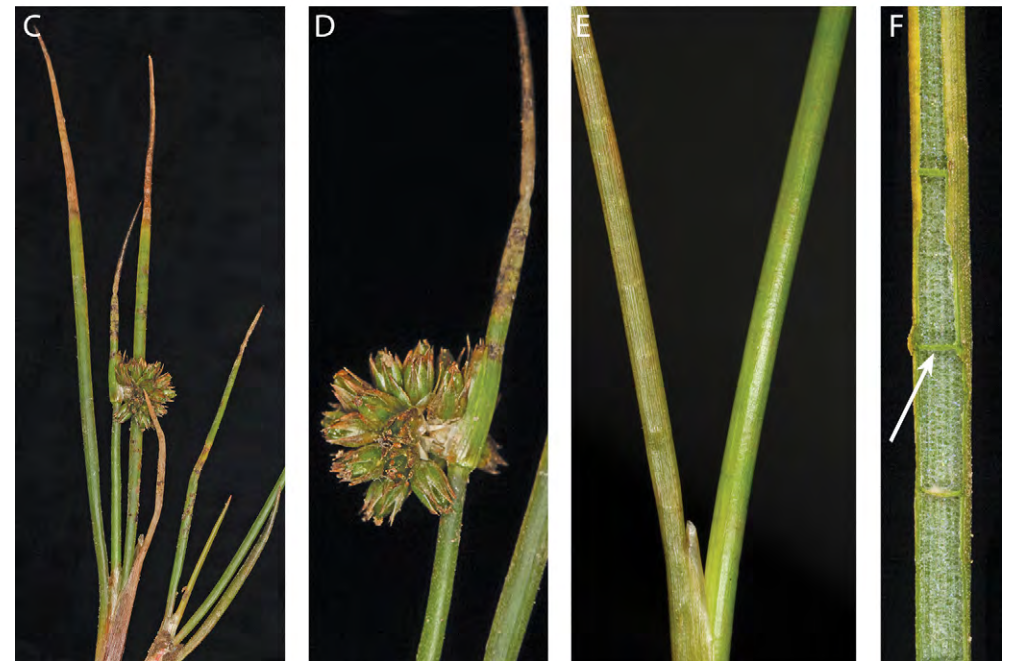
Threat status (2012): Native, Nationally Critical

NZ distribution: Formerly widespread, only recently collected near Taupo

Habitat: Coastal and lowland to sub-alpine wetlands. Always found growing in shallow water.

Identification features: Tufted bright-green rush up to 45 cm tall. Stems round with cross walls absent or just evident. Leaf sheath pale green to almost white. **Leaves:** tubular with internal cross walls (feels like it clicks if you hold base of leaf between finger and thumb and slide up). Leaves upright to curving and tapering gradually to a point. **Flower heads:** open with long branches, with 5-20 almost round flowerheads (each with 5-20 flowers up to 1 cm across). Modified leaf (bract) extends from base of flower head, usually shorter than flower head. **Capsules:** 4.5 mm long, slightly tapered at the tip, brown. **Tepals:** more or less equal in length compared to capsules.

Similar species: Most similar to *J. prismatocarpus* and *J. fockei*. Differs from *J. prismatocarpus* in that it has round, rather than flat leaves with internal cross walls that extend across the entire leaf width, and flowers with 6 rather than 3 stamens. It differs from *J. fockei* in that its capsules are shorter, slightly tapered and more or less equal in length to the tepals.



A- flower head showing capsules and tepals, B- old flower head, C- whole plant, D- flower head showing leaf like extension, E- leaf and stem, F- leaf with internal crosswalls.



Genus-species: *Juncus homalocaulis*

Authority: F.Muell., 1853

Subordinate taxa: -

Synonyms and authority: -

Common name: -

Section: Steirochloa

Threat status (2012): Naturalised

NZ distribution: Mostly Northland, from Kaitaia north, but a few recent collections around Auckland

Habitat: Grasslands and temporarily wet habitats.

Identification features: Dense tufted plants up to 18 cm tall. **Leaves:** 3-5 per stem, channelled or hair-like, wiry, with short hard lobes at the leaf base. **Flower heads:** very long (up to 10 cm long), and widely spread. **Capsules:** narrow 4.5-5.5 mm long. **Tepals:** longer in length to capsules.

Similar species: Unlike other *Juncus* when flowering, with long, narrow flowers. Vegetatively similar to *J. tenuis* but lacking the long, ear-like membrane (auricle).



Herbarium images. A- whole plant , B-D- flower heads, D- flower head showing close up of capsules and tepals. (Images and title banner image supplied by Allan Herbarium, CHR copyright, Landcare Research).



Genus-species: *Juncus imbricatus*

Authority: Laharpe, 1827

Subordinate taxa: *Juncus imbricatus* var. *chamoissonis* (Kunth) Buchenau (1906)

Synonyms and authority: -

Common name: -

Section: Steirochloa

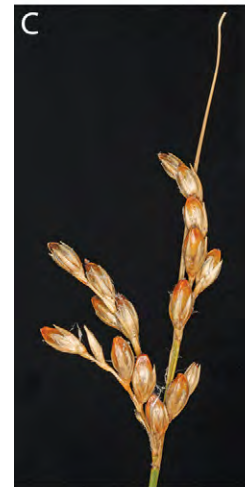
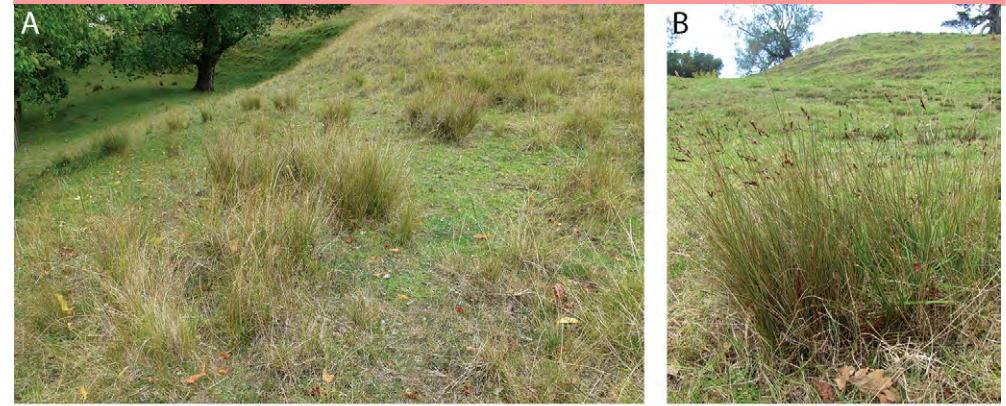
Threat status (2012): Naturalised

NZ distribution: Mostly Auckland and Nelson with other collections from Wanganui and Otago

Habitat: Dry disturbed grassland and road verges.

Identification features: Stiffly clumped tufts to 70 cm tall. **Leaves:** 1-2 per stem, very slender, wiry, channelled, shorter than stem, growing from base. **Flower heads:** 2.5-6 cm long, few branches, overtopped by rigid leaf like extension. Flowers arranged individually along branchlets. **Capsules:** very large, 6-6.5 mm long. **Tepals:** much shorter in length to capsule.

Similar species: Forming denser, taller tufts than other *Juncus* in the subgenus Steirochloa, with much larger capsules.



A- habitat, B- whole plant, C- flower head showing leaf like extension, D- capsules and tepals, E- leaves, F- leaf with ear-like membrane (auricle), G- base of plant.



Genus-species: *Juncus inflexus*

Authority: L., 1753

Subordinate taxa: -

Synonyms and authority: -

Common name: hard rush

Section: Juncotypus

Threat status (2012): Naturalised

NZ distribution: Eastern NI from E Cape S, West Coast, Canterbury and Otago

Habitat: Damp pasture, rushlands and wetland margins.

Identification features: Large dense tufted, leafless rush up to 60 cm tall. Stems are hard with obvious ridges and dull grey-green colour. **Pith:** when stem is split length ways, pith has distinct holes.

Leaves: absent, reduced to basal sheaths which are dark purple brown to black, glossy at the base.

Flower heads: branched, spreading or tightly packed, flowers evenly spaced on branchlets. **Capsules:**

2.5-4 cm long, dark brown to black. **Tepals:** similar (\pm) to length of capsules.

Similar species: Can be distinguished from all other grey-green leafless rushes by the dark-brown to black capsules.



A- habitat, B- whole plant , C- flower heads, D- capsules and tepals, E- interrupted pith and ridged stems, F- dark basal sheaths.



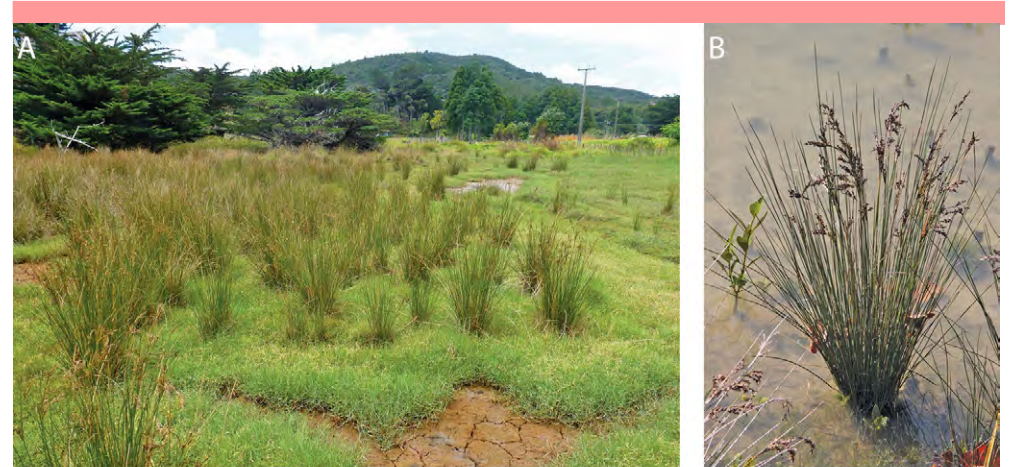
- Genus-species:** *Juncus kraussii*
- Authority:** Hochst., 1845
- Subordinate taxa:** subsp. *australiensis* (Buchenau) Snogerup (1993)
- Synonyms and authority:** *Juncus maritimus* var. *australiensis* Buchenau (1890), *Juncus kraussii* var. *australiensis* (nom. inv.)
- Common name:** sea rush
- Section:** Juncus
- Threat status (2012):** Native, non threatened

NZ distribution: North, South and Chatham Island. From Te Pahi to Okarito in the west and Dunedin in the South. Inland in the North Island at Lake Rotorua, at Orakei korako, and in the South Island at Mesopotamia, Rangitata River.

Habitat: Primarily coastal and found in salt marshes, brackish streams, lagoons, estuaries and river margins. Also inland around geothermal vents.

Identification features: A dense to loosely tufted rush, dark brown to brownish-black, growing up to 1.2 m tall. **Leaves:** usually 1-2, bright green, tubular and look similar to the stems but shorter. **Flower heads:** irregularly-branched with many clusters forming near the end of stems. **Capsules:** egg-shaped, bumpy and dark brown to almost black. **Tepals:** slightly shorter in length than capsule.

Similar species: Rushes in Section Juncotypus have leaves reduced to basal sheaths, whereas Section Juncus (*J. acutus* and *J. kraussii*) have leaves similar to the stems. *J. acutus* has larger and more dense compact flower heads.



A- habitat, B- whole plant, C- stems and leaves are the same colour and shape only stems have flower heads at the tip, D- branched flower heads, E- long bract and immature capsules at base of flower clusters, F- base of plant.



Genus-species: *Juncus lomatoophyllus*

Authority: Spreng., 1821

Subordinate taxa: -

Synonyms and authority: -

Common name: broad-leaved rush

Section: Graminifolii

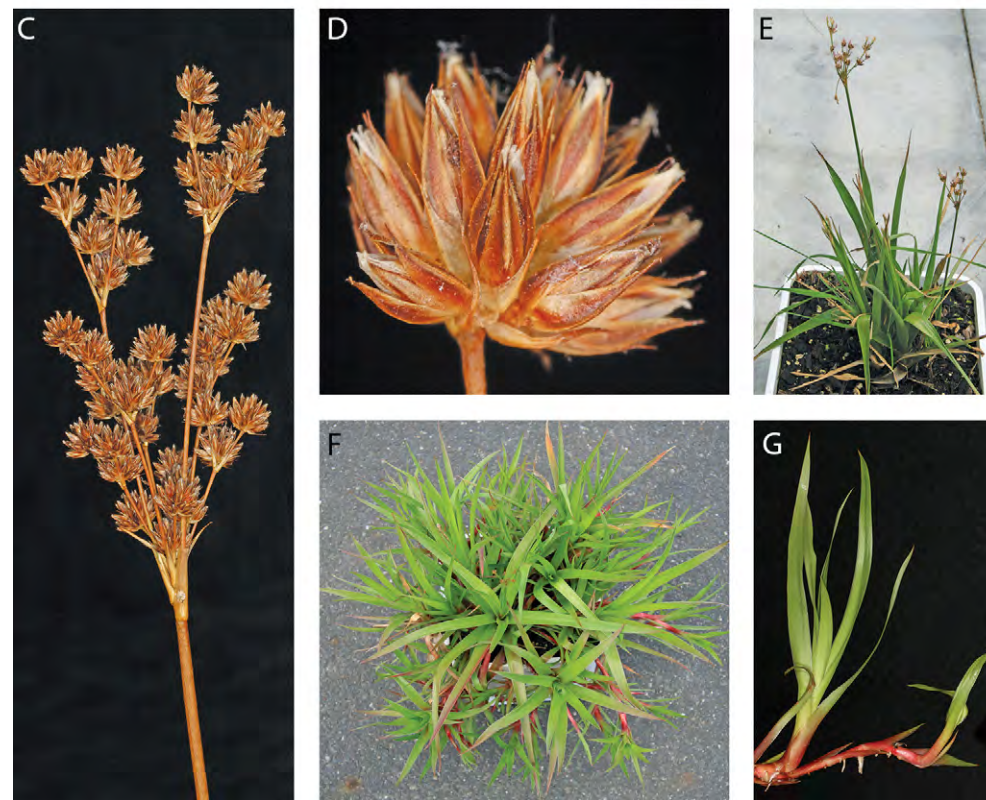
Threat status (2012): Naturalised

NZ distribution: Common in coastal Buller and Westland

Habitat: Wet pasture and a wide range of wet habitats.

Identification features: Tufted, grass-like rush up to 74 cm tall. **Leaves:** very wide at the base (up to 1.5 cm wide), flat and taper to a fine point. Occasionally reddish-tinged near margins and leaf tips. The bases of leaves are often red. **Flower heads:** branched, made up of 3 to 12 clusters of dark-brown to black flowers/capsules. **Capsules:** 2.5-3mm long, dark brown and pointed. **Tepals:** longer in length than capsules.

Similar species: No other grass-leaved rush has such large and wide leaves, perhaps the native *J. planifolius* is the most similar, but has narrower leaves, lacks the stoloniferous sward-forming growth habit and has much smaller (2.5 mm) capsules and flower clusters.



A- habitat, B- whole plants, C- flower heads, D- capsules and tepals, E- whole plant potted, F- whole plant from above showing flat leaves tapering to a point, G- leaf bases often red and creeping rhizome.



Genus-species: *Juncus microcephalus*

Authority: Kunth, 1815

Subordinate taxa: -

Synonyms and authority: -

Common name: South American rush

Section: Ozophyllum

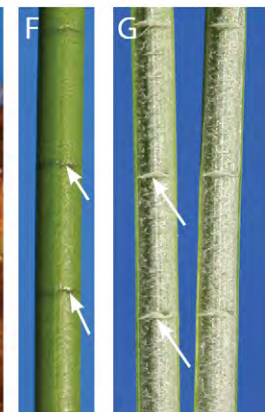
Threat status (2012): Naturalised

NZ distribution: Throughout NI, SI from Tasman, Westland and Canterbury

Habitat: Swamp ground, especially disturbed areas, water body margins.

Identification features: Upright leafy rush to 90 cm tall. **Leaves:** tubular with internal cross walls (feels like clicks if you hold base of leaf between finger and thumb and slide up). **Flower heads:** many branched, with 3-8 flowered clusters near the end of stem. **Capsules:** 2.5-3.5 mm long, broad, flat topped with a sharp tip and reddish-brown in colour. **Tepals:** equal to or greater in length compared to capsule.

Similar species: Similar to other tubular leaved rushes with visible cross walls in leaves, but is taller and stouter than most other species (except *J. acutiflorus*) and has flat topped capsules with a sharp pointed tip.



A- habitat, B- whole plant, C- flower heads, D- capsules and tepals, E- capsule with sharp pointed tip, F- leaves with crosswalls visible externally, G- cross section of leaf showing internal cross walls.



Genus-species: *Juncus novae-zelandiae*

Authority: Hook.f., 1853

Subordinate taxa: -

Synonyms and authority: -

Common name: dwarf rush

Section: Ozophyllum

Threat status (2012): Endemic, non threatened

NZ distribution: Southwards from Waikato and Bay of Plenty

Habitat: Mostly in mountains but also in open places such as swamps and wet open scrub areas.

Identification features: Small dense tufts that can form large patches from a creeping rhizome.

Leaves: 2-10 cm long, tubular with visible cross walls. Flower heads: forms a single head of 3-5 flowers, exceeded by a leaf like extension. **Capsules:** up to 3 mm long, oblong and shining black. **Tepals:** much shorter in length compared to capsules.

Similar species: Similar to *J. antarcticus*, *J. pusillus*, and *J. scheuchzerioides*. It differs from *J. antarcticus* (with which it may grow) by having visible cross-walls on leaves, red or greenish brown rather than dark maroon to black tepals and consistently 6 rather than 3-6 stamens. Differs from *J. pusillus* by the lustrous black rather than dull pale-brown capsules. Differs from *J. scheuchzerioides* in having a single head of 3-5 flowers, shining black capsules and a leaf like extension that exceeds the flower head.



A- habitat, B- whole plant, C- flower head, D- capsules and tepals, E- whole plant showing creeping rhizome.



Genus-species: *Juncus ochrocoleus*

Authority: L.A.S.Johnson (1993)

Subordinate taxa: -

Synonyms and authority: -

Common name: -

Section: Juncotypus

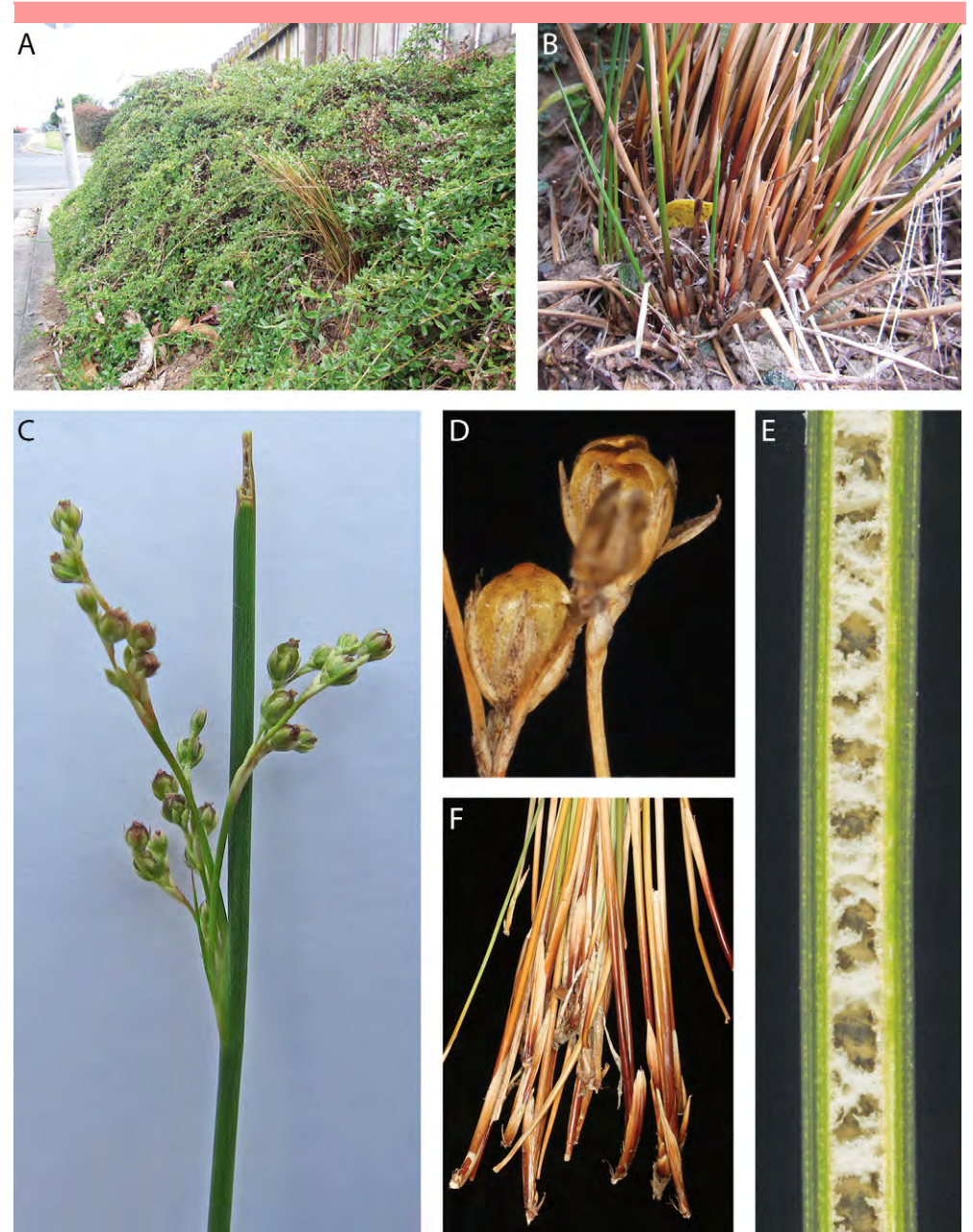
Threat status (2012): Naturalised

NZ distribution: One site in Auckland City

Habitat: In its native range in Eastern Australia prefers seasonally wet, sandy places. Plants found in New Zealand were collected from a shrubbery on clay substrate.

Identification features: Dense tufted, leafless rush with yellow-green stems growing up to 110 cm tall. **Pith:** when stem is split length ways, pith has distinct holes. **Leaves:** absent, reduced to basal sheaths that are yellow-to golden-brown. **Flower heads:** an open cluster with flowers evenly spaced on branchlets. **Capsules:** 2.0-2.5 mm long, shining golden-brown. **Tepals:** shorter in length compared to capsules.

Similar species: Can be distinguished from most other leafless rushes by the yellow- to golden-brown basal sheaths. *J. subsecundus* also has this character but has grey-green ridged stems and a fan-shaped (not clustered) flower head.



A- habitat, B- base of plant, C- flower head, D- capsules and tepals, E- interrupted pith, F- golden brown basal sheaths.



Genus-species: *Juncus pallidus*

Authority: R.Br., 1810

Subordinate taxa: -

Synonyms and authority: *Juncus macrostigma* Colenso (1884)

Common name: giant rush

Section: Juncotypus

Threat status (2012): Native, non threatened

NZ distribution: North, South, and Stewart Islands.

Habitat: Coastal to lowland. Often in pastures where it can be a major weed. Usually in damp swampy hollows, on the margins of wetland and lakes, in open shrubland on damp ground.

Identification features: Very robust forming dense grey-green clumps up to 2 m tall. Flowering stems erect, smooth and slightly glossy. Has many hair like bracts at the base of stems. **Pith:** when stem is split length ways, pith is continuous (without holes). **Leaves:** absent, reduced to basal sheaths. **Flower heads:** many flowers usually condensed into fan like clusters near the end of stems. **Capsules:** 2.8-3.6 mm long and a pale greenish-brown. **Tepals:** usually much shorter in length than capsules.

Similar species: Can be confused with *J. procerus* which is also an extremely robust species of similar habitats. However *J. procerus* usually has dark green stems and the internal pith is interrupted not continuous. *J. pauciflorus* is a very uncommon species with very slender, tough, bright green stems, rather than ridgedly stout branchlets.



A- habitat, B- whole plant, C- capsules and tepals, D- flower head, E- stem, F- continuous pith, G- basal sheaths.



Genus-species: *Juncus pauciflorus*

Authority: R.Br., 1810

Subordinate taxa: -

Synonyms and authority: *Juncus gunnii* Hook.f. (1858), *Juncus pauciflorus* var. *gunnii* (Hook.f.) Buchenau (1890)

Common name: -

Section: Juncotypus

Threat status (2012): Native, Nationally Vulnerable

NZ distribution: Uncommon but scattered in N & SI, probably most abundant on Great Barrier Island

Habitat: Coastal to lowland in damp ground and hollows under light scrub, in pasture, swamp margins or within coastal forest.

Identification features: Open clumps spreading widely from the base up to 1 m tall with sprawling almost floppy smooth, dark-green stems less than or equal to 2 mm wide. **Pith:** when stem is split length ways, pith is continuous (without holes). **Leaves:** absent, but has very short leaf like appendages at the base of each stem that are conspicuously dark red-brown in colour. **Flower heads:** open with only a few flowers forming one cluster close to the stem and one or more upon a slender curved branchlet. **Capsules:** 2.5-3.5 mm long, egg shaped, light brown to red-brown, often very dark towards apex. **Tepals:** usually distinctly shorter than the tepals.

Similar species: The rather widely spreading, very thin, loose almost floppy bright-green stems and slender, flexible branchlets are especially distinctive of this species. May be confused with *J. pallidus* or *J. procerus* which both differ in having extremely robust stems greater than 3 mm wide.



Herbarium images. A- whole plant , B,C&E- flower heads, D- flower head showing close up of capsules and tepals, F- creeping rhizome. (Images A, C, D, E, F and the title banner image supplied by Allan Herbarium, CHR copyright, Landcare Research. Photo B supplied by the Auckland Museum Herbarium)



Genus-species: *Juncus planifolius*

Authority: R.Br., 1810

Subordinate taxa: -

Synonyms and authority: -

Common name: grass-leaved rush

Section: Graminifolii

Threat status (2012): Native, non threatened

NZ distribution: Widespread in the North, South, Stewart and Chatham Islands.

Habitat: Open, moist ground. Often found on fresh exposed damp clay, or along track sides or on the margins of drains.

Identification features: A tufted grass-like rush of variable size with stems up to 40 cm high.

Leaves: wide (15 mm), flat, tapering to a point and are blue-green to reddish at the base. **Flower heads:** irregularly branched and with circular flower clusters forming at the end of branches. **Capsules:** approx 2 mm long, egg-shaped and shining reddish-brown to brownish-black. **Tepals:** slightly shorter than the length of capsules.

Similar species: Easily recognised by the cluster of flower heads and flat leaves. Differs from *J. caespiticus* by its flat, not channelled leaves, and flower heads with branches originating from a central point rather than compact circular flower heads.



A- habitat, B- whole plant, C- flower heads, D- capsules and tepals, E- leaves reddish colour at base.



Genus-species: *Juncus polyanthemus*

Authority: Buchenau

Subordinate taxa: -

Synonyms and authority: -

Common name: -

Section: Juncotypus

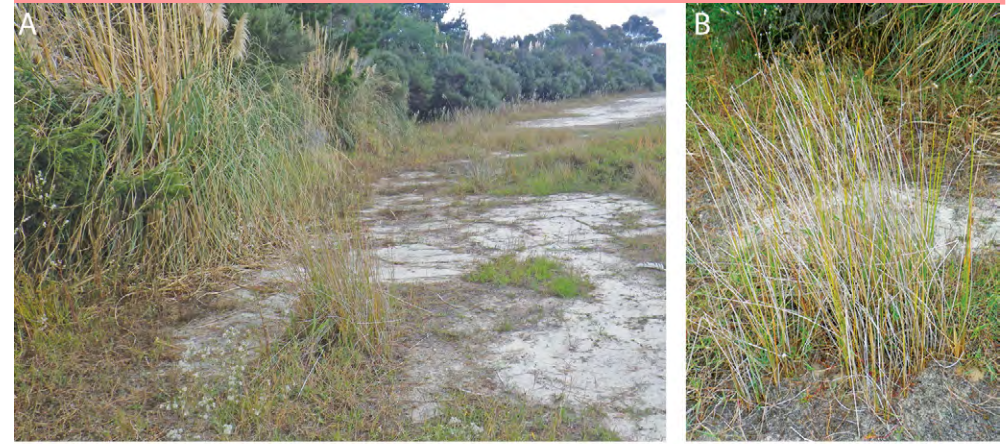
Threat status (2012): Native, Coloniser

NZ distribution: Two collections from Karikari Peninsula, Northland and near Palmerston North.

Habitat: Coastal swamps and wet pastures in E Australia and New Caledonia. One NZ collection was made from a swamp forest remnant, the other was on an iron pan lake margin.

Identification features: Dense tufted, leafless rush up to 145 cm tall. Stems are soft, green and 4-10 mm in diameter. **Pith:** when stem is split length ways, pith has distinctive large holes. **Leaves:** absent, reduced to basal sheaths that are dark chestnut-brown and glossy at the base. **Flower heads:** 3-10 cm long, an open cluster with flowers evenly spaced on branchlets. Capsule 1.8-2.5 mm long and golden-brown in colour. **Tepals:** equal or slightly less than length of capsules.

Similar species: Not commonly found in New Zealand. A robust leafless rush, with an open flower head with evenly spaced flowers, and glossy chestnut-brown basal sheath. Unlike other leafless species.



A- habitat, B- whole plant, C&D- flower heads, E- stems, F- capsules and tepals, G- basal sheaths. (Images C, D, E, F and title banner supplied by Forest and Kim Starr)



Genus-species: *Juncus prismatocarpus*

Authority: R.Br., 1810

Subordinate taxa: -

Synonyms and authority: -

Common name: -

Section: Iridifolii

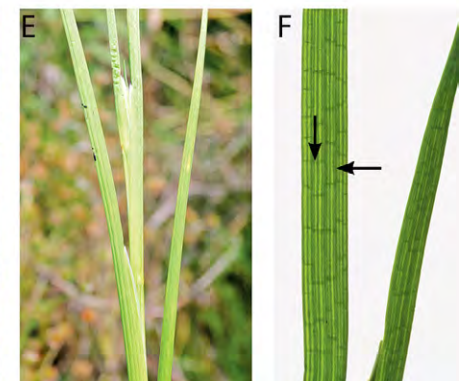
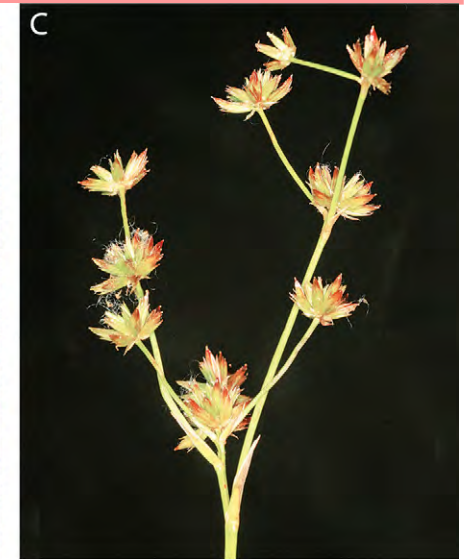
Threat status (2012): Native, non threatened

NZ distribution: North Island and only from a few scattered sites in Nelson and Westland in the South Island.

Habitat: Coastal to montane. Usually in lowland wetland habitats or in poorly drained soils in open scrub.

Identification features: An upright, bright green to yellow green, loosely tufted rush growing up to 60 cm tall. Stems flattened and rarely round but hollow. **Leaves:** many, flat (sword like) and multi-tubular with each individual tubular partition with visible cross walls (easily seen if the leaf is held to the light). **Flower heads:** open, with long branches and distant many flowered clusters. **Capsules:** 4.5-5 mm long, rust or straw coloured, long-tapered. **Teapals:** usually much shorter than length of capsules.

Similar species: Easily recognised by the bright green to yellow-green, more or less flat sword-like leaves which are multi-tubular, with internal cross walls only extending part way across the leaf width (cross walls, easily seen if the leaf is held to the light). It is most often confused with *J. fockei* and *J. holoschoenus*. Both species differ from *J. prismatocarpus* by having unitubular round leaves whose internal cross walls extend across the entire leaf width, and by their flower which have six rather than three stamens.



A- habitat, B&C- flower heads, D- capsules and tepals, E- leaves and stems, F- leaves with vertical and horizontal crosswalls.



Genus-species: *Juncus procerus*

Authority: E.Mey., 1828

Subordinate taxa: -

Synonyms and authority: *Juncus pallidus* var. *triandrus* Cheeseman (1925)

Common name: giant rush

Section: Juncotypus

Threat status (2012): Naturalised

NZ distribution: Scattered in Wellington and SI, locally common on Stewart Is. Old collections from Auckland.

Habitat: Damp rushland and forest margins.

Identification features: Very robust tufted, leafless rush up to and occasionally exceeding 2 m tall. Stems grey-green in colour and 2-4.5 mm diameter. **Pith:** when stem is split length ways, pith has distinctive large holes. **Leaves:** reduced to basal sheaths which are dark red-brown or black, glossy at the base. **Flower heads:** an open cluster with flowers evenly spaced on branchlets. 3-10 cm long. **Capsules:** 1.8-2.5 mm long, golden-brown. **Tepals:** similar or shorter in length to capsules.

Similar species: A very robust leafless rush, with an open flower head with evenly spaced flowers, and glossy chestnut-brown basal sheath. Only *J. pallidus* approaches the same size but this species has grey-green stems and continuous pith.



A- habitat, B- whole plant, C- flower head, D- capsules and tepals, E- basal sheaths, F- interrupted pith. (Images B, C, D, E & F supplied by Marilyn Gray, Yarra Ranges Council, Victoria, Australia)



Genus-species: *Juncus pusillus*

Authority: Buchenau, 1879

Subordinate taxa: -

Synonyms and authority: *Juncus capillaceus* Hook.f. (1853)

Common name: dwarf rush

Section: Ozophyllum

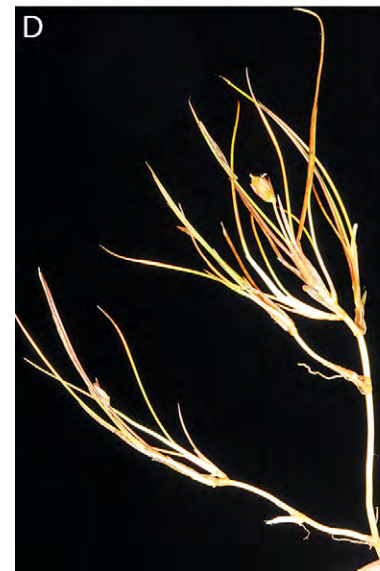
Threat status (2012): Endemic, non threatened

NZ distribution: Southwards from Bay of Plenty

Habitat: Open, swampy ground in bogs and alongside tarn, lake and river margins. Costal to alpine. Often associated with *J. novae-zelandiae*.

Identification features: Tiny creeping plant with fine leaves, 2-3 cm long. **Leaves:** delicate and tubular, often longer than length of flowering stems. **Flower heads:** short, flowers either singular or 2-3 together at the end of stems. **Capsules:** pale brown, oblong with a distinctive point. **Tepals:** shorter in length than capsule.

Similar species: Most likely confused with *J. scheuchzeriodes* and *J. novae-zelandiae*. From *J. scheuchzeriodes* it differs by the tubular rather than flat red-brown to brown rather than pale-green, red-green leaves which are less than 0.5 mm wide. Furthermore it has flowers which are 1.5-3 mm rather than 4 mm long. From *J. novae-zelandiae* it differs by the light brown rather than shiny black tipped mature capsules and stems which are less than the length of the leaves at maturity.



A- lakeside habitat in circled area, B- whole plant, C- immature flower head with stamens and filaments, D- fine leaves and flower head shorter than leaves, E-capsule with distinctive tip and tepals, F- creeping rhizome.



Genus-species: *Juncus sarophorus*

Authority: L.A.S.Johnson, 1963

Subordinate taxa: -

Synonyms and authority: -

Common name: fan-flowered rush

Section: Juncotypus

Threat status (2012): Native, non threatened

NZ distribution: Widespread in the North, South, Stewart, Campbell and Chatham Islands.

Habitat: Coastal to lowland in damp, open ground. Often in pasture or on the margins of coastal wetlands, and along river flats.

Identification features: Densely tufted forming stiff blue-green clumps. Stems tightly clumped and erect near base but usually drooping from the upper half to one third. Stems finely grooved. **Pith:** when stem is split length ways, pith has distinct holes. **Leaves:** absent, reduced to basal sheaths at the base of stems which are usually black or dark red-purple in colour. **Flower heads:** many flowers clustered together as dense fan-shaped head of very pale brown or cream flowers. **Capsules:** oblong, from >1.5-2 mm long. **Tepals:** similar length to capsules.

Similar species: Easily distinguished by the combination of dense, tussock forming habit, blue-green, drooping stems and compact, many-flowered, fan shaped flower heads. Most similar to *J. inflexus* and *J. flavidus*. *J. inflexus* differs by the open rather than dense fan-shaped flower heads, by the flower head not being held close to the stem, and dark brown to black rather than light-brown capsules 2.5-3.5 rather than 1.5-2 mm long. *J. flavidus* differs by pale rather than dark red-brown basal sheaths.



A- habitat, B- flower head, C-capsules and tepals, D- stems finely grooved, E- basal sheaths, F- interrupted pith.



Genus-species: *Juncus scheuchzerioides*

Authority: Gaudich., 1825

Subordinate taxa: -

Synonyms and authority: -

Common name: -

Section: Ozophyllum

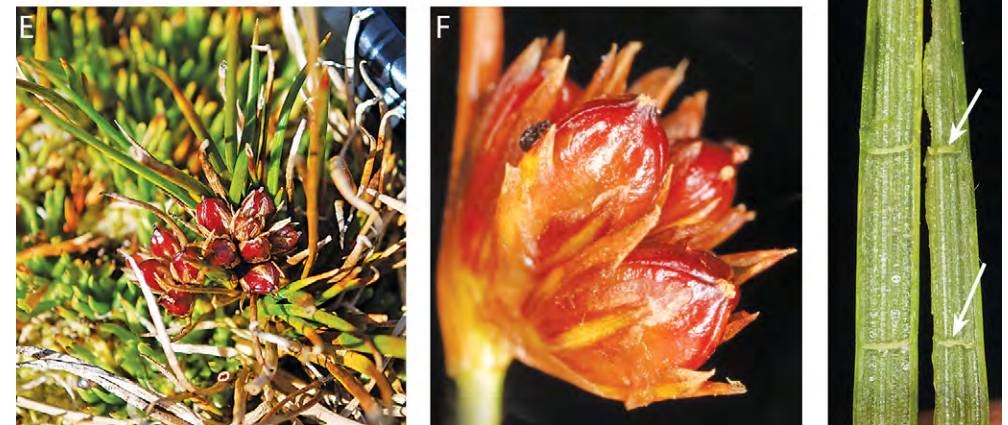
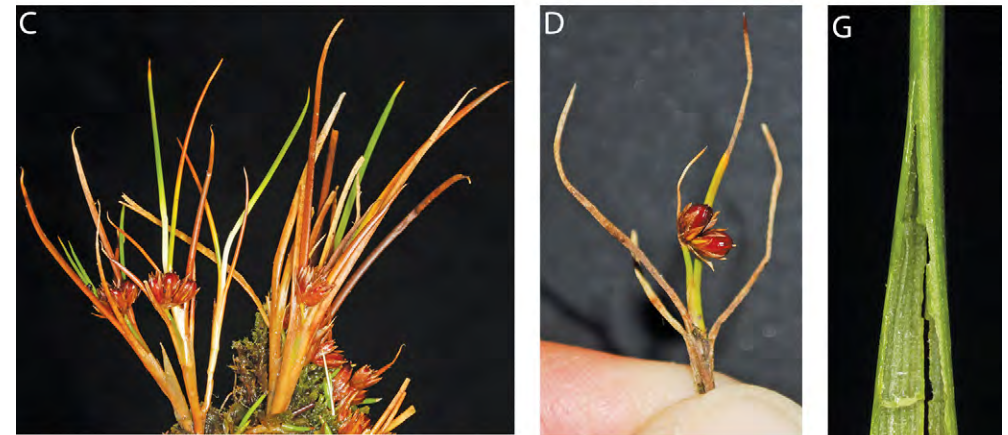
Threat status (2012): Native, Naturally Uncommon

NZ distribution: Subantarctic Islands

Habitat: Sea level to 300 m.a.s.l. Usually in or near running water or in open peaty turf.

Identification features: Densely tufted rush with stems growing up to 20 cm high. Dark-green, red-green or bright green in colour. **Leaves:** many leaves that grow much longer than the stems and are narrow tapering to point. **Flower heads:** a simple compact head of 3-8 flowers, very rarely producing a second head. Flowers 4 mm long. **Capsules:** egg-shaped, light brown or red-brown. **Tepals:** less than or greater than length of capsules.

Similar species: Could be confused with *J. pusillus* which also grows on the Auckland Islands. *J. pusillus* differs in that it has tubular rather than flat leaves and leaves which are less than rather than greater than 0.5 mm wide. *J. pusillus* leaves are usually dark brown or red-brown rather than *J. scheuchzerioides* leaves which are pale green, red-green to bright green colour. Also resembles *J. novae-zelandiae* but differs in having clusters of 3-8 flowers, and brown capsules.



A- habitat, B- whole plants, C- whole plant showing position of flowers with leaves growing much longer than the stem, D- note small size of plant next to thumb nail, E- flower heads, F- capsules and tepals, G- leaves with internally visible cross walls.



Genus-species: *Juncus sonderianus*

Authority: Buchenau, 1875

Subordinate taxa: -

Synonyms and authority: *Juncus* sp. aff. *caespiticus* (nom. inv.)

Common name: -

Section: Graminifolii

Threat status (2012): Naturalised

NZ distribution: Coastal Northland and Auckland

Habitat: Wet sandy places.

Identification features: Tufted, grass like leafy rush growing in tufts to 35 cm tall. **Leaves:** mostly at the base of the plant, stiff, arching and up to 15 cm long and 5 mm wide. **Flower heads:** branched with 1 to 3 clusters of many tightly clumped greenish to chestnut brown flowers/capsules. **Capsules:** 2.5-3mm long and egg-shaped. **Tepals:** longer than the length of capsules.

Similar species: Very similar to the native *J. caespiticus*, but unlike this species it has more than 2 compact circular heads.



A- habitat, B- whole plant with leaves originating at or near the base, C-flower heads with modified leaf (bract) longer than flower head, D- capsules and tepals, E- leaves with arching curve, F- leaves rolled inward (not flat) , G- base of leaves.



Genus-species: *Juncus squarrosus*

Authority: L., 1753

Subordinate taxa: -

Synonyms and authority: -

Common name: heath rush

Section: Steirochloa

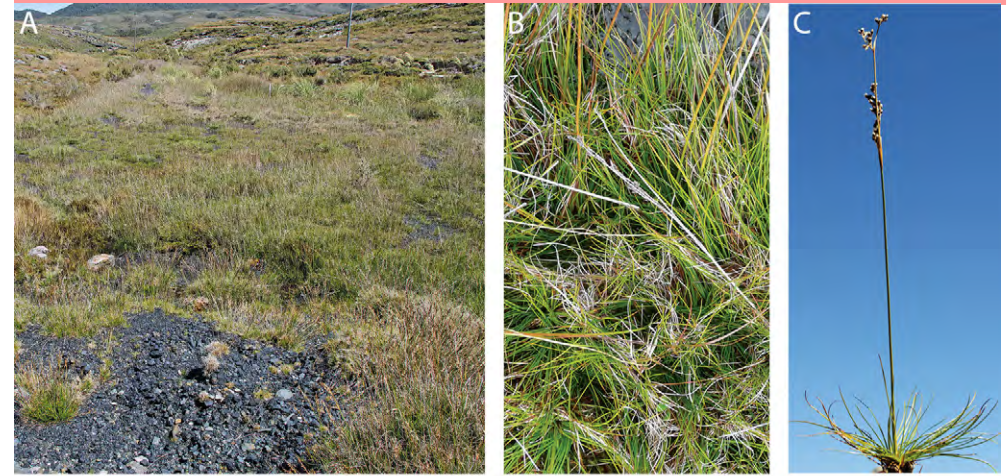
Threat status (2012): Naturalised

NZ distribution: Scattered in Wellington and South Island.

Habitat: Peaty and other low nutrient (acid) sites.

Identification features: Leafy rush to 35 cm tall with leaves bent sharply back or down. **Leaves:** stiff, wiry and flexible, with most bending downwards just above the base. Leaves half the length of stems. **Flower heads:** clusters of 2 to 3 dark brown flowers form at end of upright flower stems with a long leaf like extension (bract) above this. **Capsules:** large, ~5 mm long, yellow-brown to dark chestnut-brown in colour. **Tepals:** slightly longer in length than capsules.

Similar species: No other rush has the stiff wiry leaves that are bent sharply back or down, and the large dark chestnut brown capsules.



A- habitat, B- whole plants often with dead foliage present, C- whole plant showing flower head, D- flower head, E- capsules and tepals, F- leaves, G- base of leaves.



Genus-species: *Juncus subnodulosus*

Authority: Schrank, 1789

Subordinate taxa: -

Synonyms and authority: -

Common name: -

Section: Ozophyllum

Threat status (2012): Naturalised

NZ distribution: Scattered in Bay of Plenty, Manawatu, Wairarapa and eastern SI

Habitat: Wet places on the margins of still and flowing waters.

Identification features: Loose tufts to 120 cm tall on a long creeping rhizome. **Leaves:** tubular with internal cross walls (feels like it clicks if you hold base of leaf between finger and thumb and slide up). **Flower heads:** branched, wide angled, with 15-50 almost round flowerheads (each with 5-18 flowers up to 0.5 cm across). **Capsules:** 2-2.8 mm long. **Tepals:** similar to or slightly shorter than capsules, hooded (closing around the capsule).

Similar species: Similar to other rushes with visible cross walls in leaves, but *J. subnodulosus* has flower heads on wide branching stems (up to 90 degrees) and hooded tepals.



A- habitat, B- whole plant, C- flower heads with wide angle of branching up to 90 degrees, D- capsules and tepals, E- leaves have internal cross walls.



Genus-species: *Juncus subsecundus*

Authority: N.A.Wakef., 1957

Subordinate taxa: -

Synonyms and authority: -

Common name: -

Section: Juncotypus

Threat status (2012): Naturalised

NZ distribution: One site in Auckland City

Habitat: Heavy dryish soils.

Identification features: Very slender leafless rush up to 90 cm tall. Stems thin (0.5-1.5 mm), grey green with distinct ridges. **Pith:** when stem is split length ways, pith has distinct holes. **Leaves:** absent, reduced to basal sheaths that are yellow to golden-brown, glossy at the very base. **Flower heads:** open, fan shaped, with branchlets of differing lengths, flowers either evenly distributed along branchlets or clustered. Capsule 2.2-2.8 cm long, golden brown. **Tepals:** similar (\pm) to length of capsules.

Similar species: Can be distinguished from most other leafless rushes by the yellow to golden-brown basal sheaths. *J. ochrocoleus* also has this character but has yellow green unridged stems and a clustered (not fan-shaped) flower head. Also could be confused with *J. usitatus* which differs by bright green to blue-green stems and capsules less than or equal to 2 mm long.



Herbarium images. A- whole plant, B&C- flower heads, D&E- close up of capsules and tepals, F- basal sheaths present. (Images A, B, E and the title banner image supplied by Allan Herbarium, CHR copyright, Landcare Research. Images C, D & F supplied by the Auckland Museum Herbarium)



Genus-species: *Juncus tenuis*

Authority: Willd., 1799

Subordinate taxa: -

Synonyms and authority: -

Common name: track rush

Section: Steirochloa

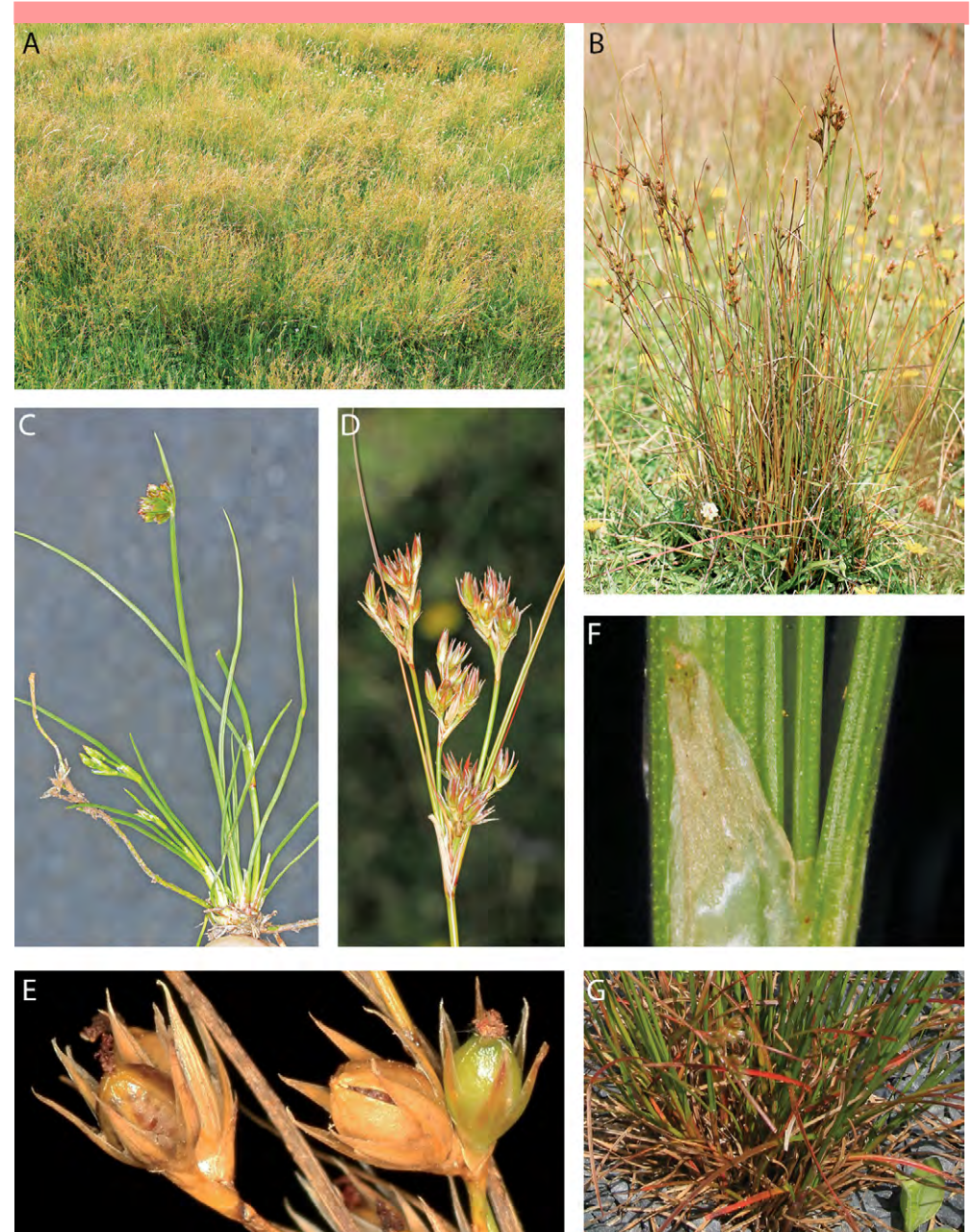
Threat status (2012): Naturalised

NZ distribution: Distributed throughout North, South and Stewart Islands.

Habitat: Open or partially shaded disturbed sites in dry or seasonally wet sandy or clay soils, often on pathways.

Identification features: Stiffly upright leafy tufts to 60 cm tall. **Leaves:** slender but tough (wiry), with thin membranous auricles 2-5 mm long at the base. **Flower heads:** usually open with flowers arranged singly along branchlets; occasionally with several clusters of flowers arranged in groups on branchlet tips. **Capsules:** 3 mm long. **Tepals:** much greater in length than capsules.

Similar species: Very similar to *J. anthelatus* which is taller, has flowers arranged singly along branchlets and capsules less than 3/4 length of tepals. *J. dichotomous* is also similar but lacks the large, membranous auricles.



A- habitat, B- whole plant, C- whole plant showing leaves and position of flower heads, D- flower head, E- capsules and tepals, F- membranous auricle at leaf base, G- whole plant.



Genus-species: *Juncus usitatus*

Authority: L.A.S.Johnson, 1963

Subordinate taxa: -

Synonyms and authority: -

Common name: -

Section: Juncotypus

Threat status (2012): Native, non threatened

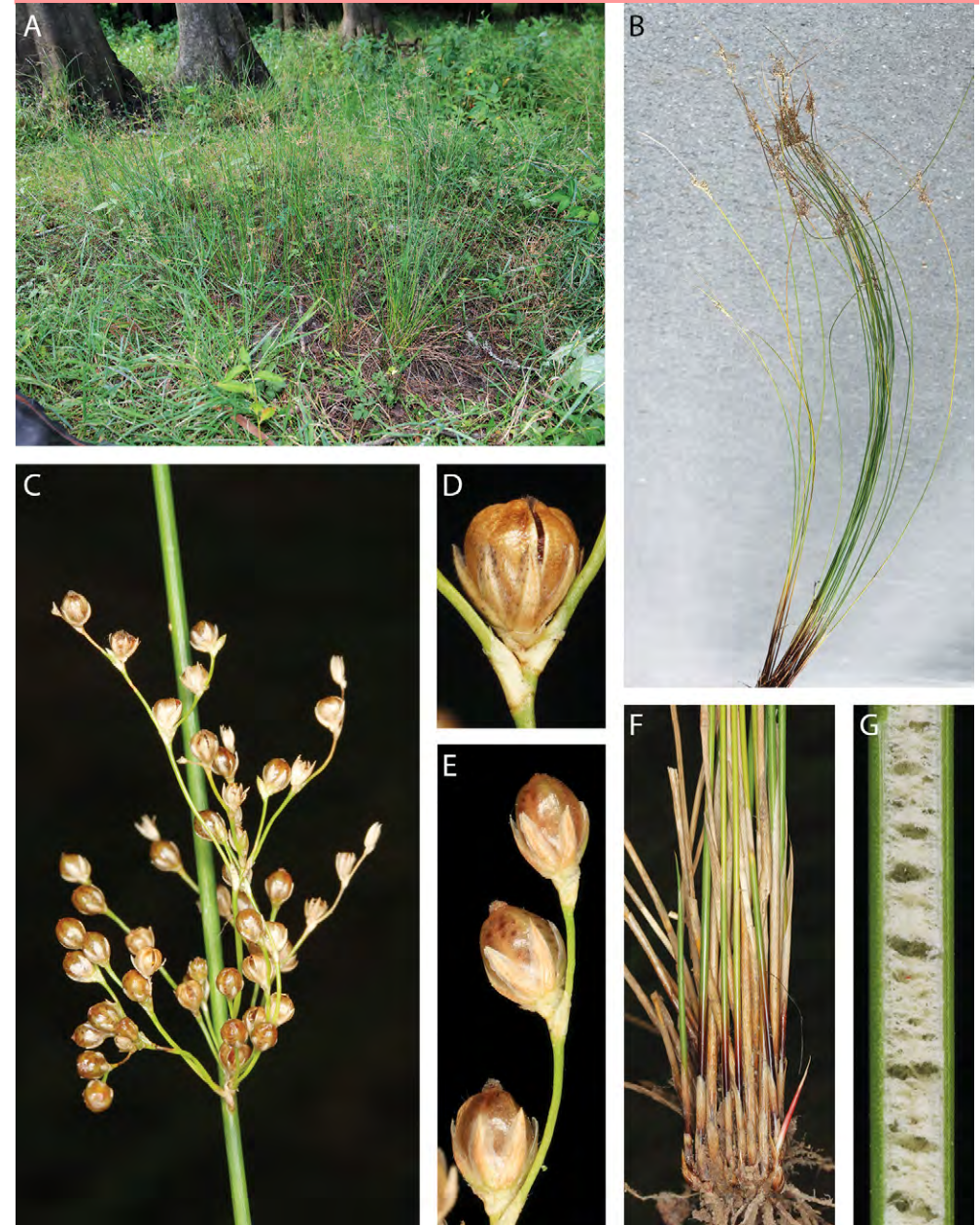
NZ distribution: Common in Northland and Auckland, scattered further south in North Island, also in Westland and Canterbury in South Island.

Habitat: Coastal to lowland. Often on offshore islands. Usually in open ground or shrubland, more rarely under tall forest.

Identification features: Densely tufted, clump-forming and upright rush. Stems are usually thin, bright green to blue-green and ridged. **Pith:** when stem is split length ways, pith has distinct holes.

Leaves: absent, reduced to basal sheaths which are red-brown and glossy at the base. **Flower heads:** openly spreading with slender branchlets and evenly spaced small flowers. **Capsules:** 1.5-2 mm long, pale brown, shining and round. **Tepals:** of similar length to capsules.

Similar species: The thin, wiry, usually bright-green stems, and widely, evenly spaced flowers/capsules on long spreading branchlets are distinctive for this species. Could be confused with *J. subsecundus* which differs by grey-green stems and capsules which are consistently greater than 2 mm long (rather than less than or equal to 2 mm).



A- habitat, B- whole plant, C- flower heads, D- mature capsule, E- capsules and tepals, F- basal sheaths, G- interrupted pith.



Genus-species: *Juncus vaginatus*

Authority: R.Br., 1810

Subordinate taxa: -

Synonyms and authority: -

Common name: -

Section: Juncotypos

Threat status (2012): Naturalised

NZ distribution: Two collections from Wairarapa.

Habitat: Damp to wet habitats.

Identification features: Leafless rush up to 1.4 m tall, with yellow green stems. **Pith:** when stem is split length ways, pith is continuous (without holes). **Leaves:** absent, reduced to basal sheaths which are deep yellow-brown to brown and dull at the base. **Flower heads:** open with, branchlets of differing lengths (7-17 cm long), flowers clustered in groups on branchlet tips. Capsule 2.8-3.3 cm long, golden brown. **Tepals:** often but not always greater in length to capsules.

Similar species: Can be distinguished from all other leafless rushes by the open branched flower heads with clusters of flowers on branchlet tips. Only collected twice in New Zealand.



Herbarium images. A- whole plant, B- open branched flower head with flowers clustered at branchlet tips, C- stems with arrow indicating continuous pith, D&E- flower head showing close up of capsules and tepals, F- basal sheaths present. (Photo B and the title banner image supplied by the Auckland Museum Herbarium. Images A, C, E F supplied by Allan Herbarium, CHR copyright, Landcare Research. Photo D supplied by the Threatened Species Section, Department of Primary Industries, Parks, Water and Environment, Tasmania)

