2022 NZPCN Conference: Drylands Field Trip notes - Mahaka Katia (Pisa Flat)

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Mahaka Katia (Pisa Flats), Lowburn, Cromwell
Geoff Rogers

Biodiversity
The mother lode for diminutive, rare herbs, grasses and lianes in the upper Clutha basin, Mahaka Katia is a 27-ha Scientific Reserve established in 2001 on a stony outwash terrace adjacent to Lake Dunstan. Years of previous visits (courtesy of a co-operative land owner, Tom Gilmore) by informed naturalists, particularly Brian Patrick and a 1989 visit by Tony Druce, identified a special dryland flora and fauna. A number of new-to-science plants were evident and a rich invertebrate fauna was subsequently celebrated by Brian Patrick and Neville Peat in their 1999 book, "Wild Central": 37-39. All this led to strong conservation advocacy for formal protection, subsequently facilitated by funding from the Nature Heritage Fund.

Following initial fencing and destocking, sustained control of rabbits has commandeered much DOC energy. But loss of herbivory leads to boosted biomass and compositional shifts, which we will discuss on our visit. Although many are browse-avoided by introduced herbivores, there has been a proliferation of exotic herbs, especially St John's Wort, Sorrel, various mulleins, sheep's bur, Viper's-Buglos, Trifolium spp. and Erodium spp. And, while much of the exotic low-growing flora overlaps with that at Hikuwai and Butterfields, the native herbs and grasses are entirely different, despite all three reserves occupying stony, outwash gravels. A few relict shrubs and subshrubs remain that point to the prehuman vegetation composition, despite the excessively well-drained substrates being highly drought-prone.

Landforms
Mahaka Katia straddles two outwash alluvial terraces of c. 70 000 yr-old postulated age (Craw et al. 2022*). Some of the range-restricted native herbs are confined to the coarsest gravels of levees and batter tops. A loess veneer has accumulated on a broad terrace depression, with attendant patches of bare soil of concentrated alkaline sodic chemistry, popularly referred to as salt pans. (For a full geomorphic and geochemical description of these patches refer to Craw et al. (2022)*.) Apparently, just one halophytic plant remains thereon – Atriplex buchananii.

*Craw D, Rufaut C, Pillai D, Kerr G 2022. Geochemical evolution of high-pH sodic salt pans in Central Otago, New Zealand. New Zealand Journal of Geology and Geophysics. Published online: DOI: 10.1080/00288306.2022.2076701.

Craspedia argentea

Developing glomerules at Mahaka Katia Scientific Reserve.

Juvenile plant growing out of Raoulia australis cushion at Mahaka Katia Scientific Reserve.

COMMON NAME
Pisa Flats woollyhead

SYNONYMS
None - first described in 2022.

FAMILY
Asteraceae

AUTHORITY
Craspedia argentea Breitw. et K.A.Ford

FLORA CATEGORY
Vascular – Native

ENDEMIC TAXON
Yes

ENDEMIC GENUS
No

ENDEMIC FAMILY
No

STRUCTURAL CLASS
Herbs - Dicotyledonous composites

CURRENT CONSERVATION STATUS
2018 | Threatened – Nationally Critical | Qualifiers: DP, OL

BRIEF DESCRIPTION
Rosette-forming herb with silvery grey, elliptic, obovate, spatulate to oblanceolate leaves. Leaf hairs appressed to floccose arranged in a wavy in pattern. Flowers heads on stems up to 130 mm tall. Flower head (capitula) yellowish-white, with dark red-purple anthers.

DISTRIBUTION
Endemic. New Zealand, Central Otago, Mahaka Katia Scientific Reserve (Pisa Flats).

HABITAT
Only known from a 25 ha area of gravelly outwash terrace, on crest and top slope of scarp; where it grows in well-drained ground with a firm, pebbly surface and fine, silty soil at 210 m above sea level near Lake Dunstan (a hydroelectric dam) (Breitwieser & Ford 2022).

SIMILAR TAXA
Allied to *Craspedia lanata* from which it differs by the rosette leaves which are mostly shorter than 50 mm, and covered with a dense, appressed to floccose, lanate indumentum. The florets also differ in that they have yellowish-white corolla and dark red-purple anthers (Breitwieser & Ford 2022).

FLOWERING
Early October to mid-November.

FLOWER COLOURS
Yellow, White

FRUITING
Late November through December.

THREATS

Craspedia argentea as *Craspedia* (a) (CHR 511522; Clutha River) has been assessed as 'Threatened/Nationally Critical' (Criteria A1, Population <250 mature individuals, with a decline rate of 10%–30%), qualified 'DP' (Data Poor), 'OL' (One Location) by the New Zealand Indigenous Vascular Plant Threat Listing Panel (de Lange et al. 2018). Since then the qualifiers for the New Zealand Threat Classification System manual 2008 have been revised and expanded (see Rolfe et al. 2021). Using the revised qualifiers Barkla (2021) recommended that the qualifiers OL (One Location), DPT (Data Poor: Trend) and CR (Conservation Research Needed) be applied because of restriction of *C. argentea* to Mahaka Katia Scientific Reserve, the lack of adequate trend data, and the need for research to better understand the causes of decline and solutions for recovery (see also Breitwieser & Ford 2022). These adjustments have yet to be ratified by the New Zealand Indigenous Vascular Plant Threat Listing Panel.

ETYMOLOGY

craspedia: Craspedia is named for the Greek 'Kraspedon', meaning an edge, hem or border, because of the woolly fringes of the leaves of the type species.
argentea: Silvery

EXTRA INFORMATION

See brief article in July 2022 Trilepidea Four new species of woollyhead (Craspedia) described from the eastern South Island (p. 2)

ATTRIBUTION

Fact Sheet prepared for NZPCN by P.J. de Lange 17 July 2022. Adapted from Breitwieser & Ford (2022).

REFERENCES AND FURTHER READING

Barkla J. 2021. Understanding the conservation status of Central Otago dryland plants believed to be imminently threatened with extinction. Contract Report No. 6691934 prepared for the Department of Conservation, Dunedin.
Breitwieser, I.; Ford, K.A. 2022: Four new species of *Craspedia* (Compositae/Asteraceae, Gnaphalieae) from the South Island of New Zealand, all characterised by dark red-purple anthers. *New Zealand Journal of Botany*. DOI: 10.1080/0028825X.2022.2095919
de Lange, P.J.; Rolfe, J.R.; Barkla, J.W.; Courtney, S.P.; Champion, P.D.; Perrie, L.R.; Beadel, S.M.; Ford, K.A.; Breitwieser, I.; Schönberger, I.; Hindmarsh-Walls, R.; Heenan, P.B.; Ladley, K. 2018: Conservation status of New Zealand indigenous vascular plants. 2017. *New Zealand Threat Classification Series 22*: 1–82. Department of Conservation, Wellington.
Rolfe J.; Makan T.; Tait A. 2021: Supplement to the New Zealand threat classification system manual 2008: new qualifiers and amendments to qualifier definitions. Wellington: Department of Conservation.

MORE INFORMATION

https://www.nzpcn.org.nz/flora/species/craspedia-argentea/

Leptinella conjuncta

Leptinella conjuncta. Photographer: Peter Heenan

Leptinella conjuncta. Photographer: Peter Heenan

SYNONYMS
None (first described in 2009)

FAMILY
Asteraceae

AUTHORITY
Leptinella conjuncta Heenan

FLORA CATEGORY
Vascular – Native

ENDEMIC TAXON
Yes

ENDEMIC GENUS
No

ENDEMIC FAMILY
No

STRUCTURAL CLASS
Herbs - Dicotyledonous composites

CHROMOSOME NUMBER
2n = 104

CURRENT CONSERVATION STATUS
2012 | Threatened – Nationally Critical | Qualifiers: Sp

PREVIOUS CONSERVATION STATUSES
2009 | Threatened – Nationally Critical | Qualifiers: Sp
2004 | Threatened – Nationally Critical

DISTRIBUTION
Endemic. South I. Central Otago (the catchments of the Clutha, Nevis, and Manuherikia rivers), and southern Canterbury (Mackenzie Basin).

HABITAT
Inner montane basins and river terraces. Known from dry, semi-arid and rain-shadow areas where it predominantly grows on terraces, terrace edges, and old river channels of gravels and alluvium.

FEATURES
Creeping perennial herb forming small open patches. Branches in clusters of up to 4 radiating from a flowering node. Leaves 1-pinnatifid, pectinate, 6–20 × 2–5mm, blade elliptic or obovate, coriaceous, moderately to densely villous, dark green to brown-green; pinnae in 5–12 pairs, 1.0–2.5 × 0.3–0.5mm, oblong, obovate or linear, apex obtuse to subacute, margin entire, terminal pinna and distal 1–3 pairs of pinnae usually joined together. Peduncles longer than leaves, 20–100mm long, 0.4–0.6mm diameter, sparsely to densely villous. Monoecious, capitula up to 5mm diameter. Involucre with phyllaries 12–24 in 2 or more subequal rows, oblong, dark green or grey-green, with 1–3 dark veins sometimes obscured by sparse to dense hairs, margin wide, brown, scarious. Pistillate florets 12–24, in 1 row; 2.0–2.7mm long, white, cream or translucent, often with 1–2 dark longitudinal stripes along corolla and ovary; corolla 1.0–1.1 × 0.5–0.6mm, lobes 4–5, each 0.1–0.2mm long; ovary 1.0–1.2 × 0.4–0.5mm, style c. 1.2mm long, stigmatic arms 0.1–0.15mm long. Staminate florets 20–50, in 3–5-rows, 2.5–2.9mm long, white, cream or translucent, often with 1–2 dark stripes along corolla and ovary, corolla with scattered sessile glandular trichomes; corolla tube 1.2–1.4 × 0.3–0.35mm, partially translucent to white; inflated corolla 0.7–0.9 × 0.9–1.0mm, translucent; corolla lobes 4–5, 0.5–0.6mm long, white, triangular, patent; ovary 0.7–0.8 × 0.25–0.35mm; stigma c. 0.2 mm diameter; filaments 1.0–1.2mm long, partially translucent to white; anthers 0.7–0.8mm long, yellow. Achenes up to 2.1 × 0.7mm, ± compressed, biconvex, golden-brown, scarcely to deeply wrinkled.

SIMILAR TAXA
Leptinella conjuncta is most similar to the L. pectinata complex but is distinguished from members of that complex by leaves that are densely hairy, 6–10mm long, and with the terminal pinna and 1–3 lateral pinnae conspicuously joined near their base; a peduncle that is shorter and more slender; a smaller capitulum; and fewer and shorter pistillate and staminate florets.

FLOWERING
October – April

FLOWER COLOURS
Cream, White

FRUITING
October – May

PROPAGATION TECHNIQUE
Easily grown in cultivation. Best propagated by division. An attractive free flowering and rather adaptable button daisy that does well in a free draining, sunny situation. It does not relish excessive moisture and humidity.

THREATS
The main threats to Leptinella conjuncta are habitat modification for horticultural and agricultural purposes and competition from naturalised species. The small size of most populations means that with disturbance the species could easily be lost from a particular place. The 2004 status shown above is taken from de Lange et al. (2004) in which the taxon was listed as as the undescribed species - Leptinella (a) (CHR 515297; Clutha River).

ETYMOLOGY
leptinella: From the Greek word leptos (meaning slender, thin or delicate), referring to the ovary

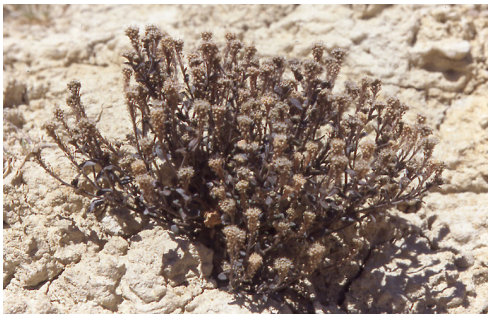
ATTRIBUTION
Description from: Heenan (2009).

REFERENCES AND FURTHER READING
Heenan, P. B. 2009: A diminutive new species of Leptinella (Asteraceae) from arid habitats of the South Island, New Zealand. New Zealand Journal of Botany 47: 127–132.

MORE INFORMATION
https://www.nzpcn.org.nz/flora/species/leptinella-conjuncta/

Lepidium solandri

Lepidium solandri. Photographer: John Barkla



Close up, Lepidium solandri, Springvale, Central Otago. Photographer: John Barkla

COMMON NAME
Maniototo peppercress

SYNONYMS
L. sisymbrioides subsp. solandri (Kirk) Thell., L. sisymbrioides subsp. solandri var. typicum Thell., Lepidium matau Petrie, Lepidium sisymbrioides subsp. matau var. lobulatum Thell., Lepidium sisymbrioides subsp. matau (Petrie) Thell.

FAMILY
Brassicaceae

AUTHORITY
Lepidium solandri Kirk

FLORA CATEGORY
Vascular – Native

ENDEMIC TAXON
Yes

ENDEMIC GENUS
No

ENDEMIC FAMILY
No

STRUCTURAL CLASS
Herbs - Dicotyledons other than Composites

NVS CODE
LEPSOL

CURRENT CONSERVATION STATUS
2018 | Threatened – Nationally Critical

PREVIOUS CONSERVATION STATUSES
2012 | Threatened – Nationally Endangered | Qualifiers: DP, Sp
2009 | Threatened – Nationally Endangered | Qualifiers: DP
2004 | Threatened – Nationally Critical

DISTRIBUTION
Endemic to S. Island, E. of the main divide from N. Canterbury to C. Otago (Galloway district, Manuherikia Valley)

HABITAT
Short and tall tussock grassland, bare hillsides, salt pans, grey scrub and other poorly vegetated ground. On open clay or salt pans, limestone talus, gravel veneers overlying schist, mudstone, or eroded silts and clays.

FEATURES
Perennial dioecious herb, with up to 24 compact, leafy rosettes. Rootstock deep rooted, up to 28 mm diam. near crown; stems spreading to erect, up to 60 mm long, 10.0 mm wide. Basal and lower stem leaves persistent, pinnatifid, pinnate, to bipinnatifid, narrow-oblong to oblong, up to 100 mm long, green, green-brown, or brown, central part of lamina 0.7–6.2 mm wide; pinnae in 14–32 pairs, linear, obovate or broadly oblong, with up to 5 secondary pinnae, terminal pinnae 3.0–16.0 x 1.0–4.9 mm, lateral pinnae 2.6–11.3 x 0.8–3.9 mm. Middle stem leaves similar, often becoming shallowly pinnatifid, serrate, or entire. Cauline leaves 2.5–19.8 x 1.2–9.8 mm, with up to 3 serrations or small lobes, or entire. Inflorescences terminal, 1.5–16.0 cm long, 0.8–3.7 mm diam. at base, usually spreading to ascending, with up to 12 lateral branches, glabrous to sparsely hairy; pedicels 2.5– 6.5 mm long, 0.2–0.35 mm wide, slightly recurved, adaxial surface glabrous to moderately hairy, abaxial surface glabrous to rarely sparsely hairy. Flowers up to 4 mm wide. Sepals 0.7–1.3 x 0.7–1.6 mm, green to maroon, sparsely to moderately hairy, rarely glabrous, margins scarious, apex obtuse. Petals usually absent, rarely present and then clawed, white, limb obovate, apex emarginate; males: 1.3–1.5 mm long; females: 0.8–1.1 mm long. Female flowers: ovary 1.0–2.4 x 1.1–1.8 mm, usually orbicular to rhomboid, sometimes ovate, sparsely to moderately hairy, rarely glabrous; style up to 0.1–0.4 mm long; stigma 0.3–0.4 mm wide; 3–7 staminodes, 0.8–1.4 mm long, rarely with malformed anthers to 0.3 mm long. Male flowers: 4–6 stamens, 1.5–2.8 mm long, white; anthers 0.3–0.6 mm long, white or maroon; ovary rudimentary, 0.2–1.1 x 0.3–1.3 mm. Nectaries 0.25–0.5 mm long, green, green-red, to red, oblong. Siliques 3.1–5.0 x 2.3–3.8 mm, usually orbicular to rhomboid, sometimes ovate, suture usually maroon, apex emarginate to retuse, style base often persistent. Seed usually obovate, rarely obovateoblong, straighter along one margin, compressed but with broad rounded margins, 1.7–2.5 mm long, not winged; both surfaces with a distinct groove from hilum at base towards apex, and the seed folded around it; apex broad and rounded; base cuneate or slightly rounded. Testa dull, orange or orange-brown to dark henna, with a fine reticulum of very thickwalled cells.

SIMILAR TAXA
Distinguished from L. sisymbrioides by shorter, wider cauline leaves, shorter terminal and primary pinnae with less frequent secondary lobing; more hairy sepals and ovaries; broader ovaries; longer stamen filaments; and ecology.

FLOWERING
September - January

FLOWER COLOURS
Green, White

FRUITING
September - February

LIFE CYCLE
Mucilaginous seeds are dispersed by attachment and possibly wind and water (Thorsen et al., 2009).

PROPAGATION TECHNIQUE
Easily grown from fresh seed.

THREATS
Less than 1000 plants are known in the wild. Few sites protected. All sites threatened by weed competition, animal browsing, and for most sites changes in land-use management.

ETYMOLOGY
lepidium: Scale-shaped (pods)
solandri: Named after Daniel Carlsson Solander (19 February 1733 - 13 May 1782) who was a Swedish naturalist and an apostle of Carl Linnaeus.

WHERE TO BUY
Not commercially available.

ATTRIBUTION
Description from: Heenan et al 2007.

REFERENCES AND FURTHER READING

Allen, R.B. 200. Inland Lepidium recovery plan 200-2019. Threatened Species Recovery Plan 32. Department of Conservation

Heenan, P.B.; Mitchell, A.D.; McLenachan, P.A.; Lockhart, P.J.; de Lange, P.J. 2007: Natural variation and conservation of Lepidium sisymbrioides Hook.f. and L. solandri Kirk (Brassicaceae) in South Island, New Zealand, based on morphological and DNA sequence data. New Zealand Journal of Botany 45: 237-264.

Thorsen, M. J.; Dickinson, K. J. M.; Seddon, P. J. 2009. Seed dispersal systems in the New Zealand flora. Perspectives in Plant Ecology, Evolution and Systematics 11: 285-309

MORE INFORMATION

https://www.nzpcn.org.nz/flora/species/lepidium-solandri/

Galium perpusillum

Hooker valley, December. Photographer: John Smith-Dodsworth

Stevensons Island, Lake Wanaka. Photographer: John Barkla

COMMON NAME
dwarf bedstraw

FAMILY
Rubiaceae

AUTHORITY
Galium perpusillum (Hook.f.) Allan

FLORA CATEGORY
Vascular – Native

ENDEMIC TAXON
Yes

ENDEMIC GENUS
No

ENDEMIC FAMILY
No

STRUCTURAL CLASS
Herbs - Dicotyledons other than Composites

NVS CODE
GALPER

CHROMOSOME NUMBER
2n = 88

CURRENT CONSERVATION STATUS
2012 | Not Threatened

PREVIOUS CONSERVATION STATUSES
2009 | Not Threatened
2004 | Not Threatened

LIFE CYCLE
Mericarps are dispersed by attachment and possibly also wind (Thorsen et al., 2009).

ETYMOLOGY
galium: From the Greek galo ‘milk’, the leaves of Galium verum being used in the past to curdle milk
perpusillum: Very small

REFERENCES AND FURTHER READING
Thorsen, M. J.; Dickinson, K. J. M.; Seddon, P. J. 2009. Seed dispersal systems in the New Zealand flora. Perspectives in Plant Ecology, Evolution and Systematics 11: 285-309

MORE INFORMATION
https://www.nzpcn.org.nz/flora/species/galium-perpusillum/

Myosotis uniflora

Bealey River (January). Photographer: John Smith-Dodsworth

Mounds of flowering plants, Pisa Flats. Photographer: John Barkla

COMMON NAME
Riverbed forget-me-not

SYNONYMS
None

FAMILY
Boraginaceae

AUTHORITY
Myosotis uniflora Hook.f.

FLORA CATEGORY
Vascular – Native

ENDEMIC TAXON
Yes

ENDEMIC GENUS
No

ENDEMIC FAMILY
No

STRUCTURAL CLASS
Herbs - Dicotyledons other than Composites

NVS CODE
MYOUNI

CURRENT CONSERVATION STATUS
2012 | At Risk – Naturally Uncommon | Qualifiers: DP, Sp

PREVIOUS CONSERVATION STATUSES
2009 | At Risk – Naturally Uncommon
2004 | Data Deficient

DISTRIBUTION
Endemic. South Island. Eastern from Canterbury to Central Otago.

HABITAT
Montane to subalpine. Favouring stony and shingle river beds, flats and consolidated moraines.

FEATURES
Much-branched tufted perennial herb arising from a long stout central woody taproot. Plants forming compact rounded cushion up to 100 mm diameter. Stems 10-50 mm long, c.5 mm diameter, crowded, ± erect, closely covered with imbricating leaves. Leaves c.5 mm long; base 1.5 mm. wide, membranous, sheathing, fringed with long hairs; lamina narrower, triangular to subulate, ± concave, apex subacute; hairs stiff, appressed, ± overlapping. Flowering branchlets short, not projecting above cushion, their leaves lacking the broad base but otherwise similar to lower leaves. Calyx c.3 mm long, lobes c. 1/2 length, rather broad, subacute, glabrous within, the whole calyx covered outside with uniform stiff appressed overlapping hairs. Corolla yellow fading to white with age, 4-5 mm diameter, tube 5 mm long, long-cylindric, lobes c.2 × 2 mm, rotund, flat; filaments short, anthers 1.5 mm long, tips protruding just above rather large scales; style 2-3× calyx, stigma capitate. Nutlets dark, up to 2.0 × 1.5 mm.

SIMILAR TAXA
A very distinct species unlikely to be confused with any other *Myosotis*, and unique in its preference for stony river beds. In the field this species is easily recognised by the dark green cushions it forms, by the closely packed stems and narrow leaves, and when flowering by the conspicuous yellow flowers.

FLOWERING
September to November

FLOWER COLOURS
White, Yellow

FRUITING
November to January

PROPAGATION TECHNIQUE
Difficult - should not be removed from the wild. This species can be grown in an alpine house but it is difficult to maintain.

THREATS
Myosotis uniflora is an uncommon, mostly sparsely distributed species occupying habitats that are becoming increasingly vulnerable to weed invasion, or used for viticulture. If these trends continue then it is likely that *M. uniflora* will eventually be listed at some of level of threat.

ETYMOLOGY
myosotis: Mouse-eared
uniflora: Single-flowered

ATTRIBUTION
Fact Sheet prepared for NZPCN by P.J. de Lange (1 February 2008). Description based on Allan (1961).

REFERENCES AND FURTHER READING
Allan, H.H. 1961: *Flora of New Zealand. Vol. I.* Goverment Printer, Wellington.

NZPCN FACT SHEET CITATION
Please cite as: de Lange, P.J. (Year at time of access): Myosotis uniflora Fact Sheet (content continuously updated). New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/myosotis-uniflora/ (Date website was queried)

MORE INFORMATION
https://www.nzpcn.org.nz/flora/species/myosotis-uniflora/

Carex decurtata

Photographer: John Barkla

Pisa Flats. Photographer: John Barkla

COMMON NAME
sedge

SYNONYMS
Carex cryptocarpa Cheeseman

FAMILY
Cyperaceae

AUTHORITY
Carex decurtata Cheeseman

FLORA CATEGORY
Vascular – Native

ENDEMIC TAXON
Yes

ENDEMIC GENUS
No

ENDEMIC FAMILY
No

STRUCTURAL CLASS
Sedges

NVS CODE
CARDEC

CURRENT CONSERVATION STATUS
2012 | Data Deficient | Qualifiers: Sp

PREVIOUS CONSERVATION STATUSES
2009 | At Risk – Naturally Uncommon
2004 | Range Restricted

DISTRIBUTION
Endemic. South Island from Canterbury to Otago, mainly known from the Mackenzie Basin (particularly from Lakes Tekapo, Pukaki and nearby tarns).

HABITAT
A plant of lake, tarn margins and river sides, preferring open stony ground or situations with little surrounding vegetation. Tolerant of long period sof water immersion.

FEATURES
Densely tufted bright green, bronze green to yellow-green, diminutive sedge of river terraces, lake and wetland margins. Culms 20-70 mm long, enclosed by light to dark brown leaf-sheaths almost to their apex. Leaves much longer than culms, 30-90 x 0.5-1 mm, almost flat bright green, bronze green to yellow-green, concavo-convex, almost flat, linear, rather rigid and coriaceous, margins scabrid, gradually tapering to a subacute apex, incurved when dry; sheaths twice as broad as lamina, pale brown with chartaceous to membranous margins. Inflorescence a crowded head of 3-5 spikes. Terminal spike male; lower spikes female, 4-8 mm long, ovoid or oblong-ovoid, greenish-brown, sessile or the lowermost rather shortly pedunculate; spikes subtended by leaf-like bracts which are longer than the inflorescence. Glumes less than or of equal length to the utricles, ovate to orbicular, acute or with the midrib extended into a long scabrid awn, nerved, membranous, red-brown with a pale centre and margin, or pale straw-coloured. Utricles 2.5-3 x 1.5 mm, plano-convex to subtrigonous, broadly ovoid, light brown, turgid at the back, faintly nerved, spreading, margins thickened and serrated toward apex, beak 0.5 mm long, scabrid, crura acutely cleft, scabrid; stipe absent although utricle narrows towards base (a pseudostipe). Stigmas 3. Nut 2 mm long, grey-brown, trigonous.

SIMILAR TAXA
Close to C. hectorii Petrie from which it differs by the light brown rather than dark brown utricles, densely tufted rather than spreading shortly rhizomatous habit, and bright green, bronze green to yellow-green, rather than blue-green to red-green leaves.

FLOWERING
October - January

FRUITING
October - July

LIFE CYCLE
Nuts surrounded by inflated utricles are dispersed by granivory and wind (Thorsen et al., 2009).

PROPAGATION TECHNIQUE
Easily grown by division of whole plants and fresh seed. Somewhat fickle in dry or humid climates and does best in a small pot.

THREATS
A naturally uncommon species largely confined to the intermontane basins of Canterbury and Otago. In some palces it is now at risk from canalisation, dairy farming (irrigation mainly) and the resultant influx of weed species. Its conservation status may require reassessment.

ETYMOLOGY
carex: Latin name for a species of sedge, now applied to the whole group.

WHERE TO BUY
Not commercially available.

ATTRIBUTION
Description adapted from Moore and Edgar (1970)

REFERENCES AND FURTHER READING
Moore, L.B.; Edgar, E. 1970: Flora of New Zealand. Vol. II. Government Printer, Wellington.
Thorsen, M. J.; Dickinson, K. J. M.; Seddon, P. J. 2009. Seed dispersal systems in the New Zealand flora. Perspectives in Plant Ecology, Evolution and Systematics 2009 Vol. 11 No. 4 pp. 285-309

MORE INFORMATION
https://www.nzpcn.org.nz/flora/species/carex-decurtata/

Convolvulus verecundus f. verecundus

At Otematata Station, upper Waitaki. Photographer: David Norton

Pisa Flats. Photographer: John Barkla

COMMON NAME
trailing bindweed, tussock bindweed

SYNONYMS
Convolvulus verecundus Allan subsp. verecundus

FAMILY
Convolvulaceae

AUTHORITY
Convolvulus verecundus Allan f. verecundus

FLORA CATEGORY
Vascular – Native

ENDEMIC TAXON
Yes

ENDEMIC GENUS
No

ENDEMIC FAMILY
No

STRUCTURAL CLASS
Lianes & Related Trailing Plants - Dicotyledons

NVS CODE
CONVER

CHROMOSOME NUMBER
2n = 22

CURRENT CONSERVATION STATUS
2018 | Threatened – Nationally Vulnerable

PREVIOUS CONSERVATION STATUSES
2012 | At Risk – Declining | Qualifiers: DP
2009 | At Risk – Declining | Qualifiers: DP
2004 | Sparse

DISTRIBUTION
Endemic. Eastern South Island only from the Clarence River (probably now Historic) south to Central Otago. Probably now most abundant in the Mackenzie Basin and upper Waitaki River Valley.

HABITAT
Mainly montane (rarely lowland) (c.200 - 1000 m a.s.l.) sparsely vegetated short tussock, or on rock outcrops such as limestone, within regions subjected to regular summer-dry conditions. It has also been found in semi-arid habitats dominated by introduced weeds.

FEATURES
Low-growing perennial herb, with creeping rhizomatous stems, short ascending to spreading branches, and lianoid stems up to 200 mm; lianoid stems with a sparse to moderate covering of retrorse hairs. Leaves in rosettes and alternate on stems, 6.5–12.0 × 4.0–12.5 mm, deltoid, deltoid ovate to ± broad-oblong, grey, grey-green, to silver grey, moderately to densely hairy with hairs antrorse and appressed; veins obscure; margin with 4–6 pairs of teeth, undulate; base truncate, obtuse, occasionally oblique or slightly cordate; apex usually retuse, occasionally obtuse; petiole channelled, sparsely to moderately covered with retrorse and antrorse hairs. Pedicel 5–30(–55) mm long, 0.4–1.2 mm diam., moderately hairy. Sepals 3.9–4.1 × 3.5–3.8 mm, obovate to ovate, green; abaxial surface sparsely to moderately hairy, adaxial surface glabrous; margin fimbriate and translucent; apex subacute to obtuse. Corolla 12–19 mm long in bud, 20–25 mm wide when open, white, rarely pink, five lobes fused their full length, lobe apex fringed with hairs; tube 5–8 mm long, pale green; abaxial surface with midline of petal with pink bands with sparse appressed hairs on upper half. Nectary annular, 0.3–0.4 mm tall, yellow. Style 2-cleft, white; fused portion 6.0–9.0 mm long, c. 0.2 mm wide; stigmata 2.5–4.0 × c. 0.5 mm. Ovary c. 1.0 × 1.0–1.2 mm, cream. Filaments 4.0–4.6 mm long, c. 0.5 mm wide at base, tapering to c. 0.2 mm at apex, white; margin with scattered short hairs on lower half; fused to base of corolla tube. Anthers 1.7–2.0 mm long, white. Capsule 5.8–6.2 mm long, 4.5–7.5 mm wide, chartaceous, globose, with 2–4 seeds, lower half enclosed in persistent calyx, style base remnant persistent. Seeds segment-shaped and broader toward apex with a rounded dorsal and two flattened lateral faces meeting at an acute ventral edge, or rounded and broadly obovate without distinct angles, almost triangular to terete in section; 2.8–3.9 × 2.4–3.0 mm; apex and base rounded; hilum concave. Testa black-brown overlaid and ornamented with grey nut-brown, dull, glabrous, moderately covered in low ridges and tubercules, sometimes forming ridges on margins

SIMILAR TAXA
Convolvulus waitaha and C. fracto-saxosa, from both of which it differs by its lianoid stems up to 200 mm long, more or less uniformly deltoid, deltoid-ovate to broad oblong leaves with smaller basal lobes, and which lack filiform or linear terminal lobes. Convolvulus verecundus f. glaberrimus differs by the glabrate brown-green rather than hairy silvery-grey leaves.

FLOWERING
November - January

FLOWER COLOURS
Red/Pink, White

FRUITING
December - March

LIFE CYCLE
Seeds are wind dispersed (Thorsen et al., 2009).

PROPAGATION TECHNIQUE
Difficult. Easily grown from fresh seed which germinates readily but does not thrive in cultivation. It particularly resents humid conditions. Probably best in a well drained pot within an alpine house.

THREATS
Threats are complex, and varied. It cannot be doubted that this species has declined from the Waitaki Valley as a consequence of hydrodevelopment of that river system. It may also have gone extinct in Marlborough, where it appears to have always been scarce. Recent field work and accounts from field workers indicate that this species exists in naturally sparse, widely scattered and mostly stable populations (Heenan et al. 2003).

ETYMOLOGY
convolvulus: From Latin convolvere, which means to twine around

ATTRIBUTION
Fact sheet prepared by P.J. de Lange (5 September 2019). Description from Heenan & Molloy (2019).

REFERENCES AND FURTHER READING

Heenan, P.B.; Molloy, B.P.J.; de Lange, P.J. 2003: Species of *Convolvulus* (Convolvulaceae) endemic to New Zealand. *New Zealand Journal of Botany 41*: 447–457.
Heenan, P.B.; Molloy, B.P.J. 2019: Five new and Nationally Threatened taxa of *Brachyscome*, *Cardamine*, *Convolvulus*, *Geranium* and *Ranunculus* obligate to vulnerable limestone habitats, eastern South Island, New Zealand. *Phytotaxa 415(1)*: 32-48.

NZPCN FACT SHEET CITATION

Please cite as: de Lange, P.J. (Year at time of access): Convolvulus verecundus f. verecundus Fact Sheet (content continuously updated). New Zealand Plant Conservation Network.
https://www.nzpcn.org.nz/flora/species/convolvulus-verecundus-f-verecundus/ (Date website was queried)

MORE INFORMATION

https://www.nzpcn.org.nz/flora/species/convolvulus-verecundus-f-verecundus/

Muehlenbeckia ephedroides

In cultivation ex Pencarrow. Photographer: Jeremy Rolfe

In cult. ex Birdlings Flat. Sep 2008. Photographer: Colin Ogle

SYNONYMS
None

FAMILY
Polygonaceae

AUTHORITY
Muehlenbeckia ephedroides Hook.f.

FLORA CATEGORY
Vascular – Native

ENDEMIC TAXON
Yes

ENDEMIC GENUS
No

ENDEMIC FAMILY
No

STRUCTURAL CLASS
Lianes & Related Trailing Plants - Dicotyledons

NVS CODE
MUEEPH

CHROMOSOME NUMBER
2n = 20

CURRENT CONSERVATION STATUS
2018 | Threatened – Nationally Vulnerable

PREVIOUS CONSERVATION STATUSES
2012 | At Risk – Declining | Qualifiers: PD, Sp
2009 | At Risk – Declining | Qualifiers: PD, Sp
2004 | Sparse

DISTRIBUTION
Endemic. North and South Islands. In the North Island mainly eastern from Lake Taupo (Acacia Bay) and the northern Hawkes Bay south to Wellington and Cape Palliser. In the South Island eastern from Marlborough to Southland.

HABITAT
Coastal to subalpine (0-1200 m a.s.l.). A species of river flats, beaches, sand spits, alluvial fans, outwash gravels and river terraces, also found in grey scrub. Favouring open, dry, free draining but fertile sites, usually on gravel and sandy soils, in habitats naturally free from other taller plants. Sometimes found on gravel roads.

FEATURES
Gynodioecious, sprawling to prostrate, grey-green, grey to grey-black shrub forming dense, untidy mats up to 1.5 m or more diameter. Stems much branched, final branches c.1 mm diameter, flexuous, striate, puberulent, grey to grey-black or grey-green. Leaves 5-25 mm long, dark to grey-green, narrow-linear, glabrous to glabrate, margins revolute, ascending, distant, spaced along constricted nodes, often sparse, deciduous,sometimes absent; ochreae 1-2 mm long, chartaceous, truncate. Inflorescence a few-flowered fascicle or raceme; pedicels 1-1.5 mm, pale, bracteate, slender. Flowers with pistillate on separate plants, and staminate and perfect on the same plant; if mainly male then raceme often lax, if female then fascicle dense, mixed male and perfect racemes more or less intermediate. tepals 3-3.5 mm long, united about halfway, lobes narrow-triangular, white, greenish or pale yellow-green; stigmas frimbriate. Fruit 3 x 1.5 mm, trigonous, ovoid, lustrous black, tepals becoming swollen, white and succulent, or rarely chartaceous and dry.

SIMILAR TAXA
None. The near leafless, dark grey to grey-black, rush-like stems, untidy, sprawling mass of seemingly dead stick and twig like branches and stems are unique to this species.

FLOWERING
November - June

FLOWER COLOURS
Green, White

FRUITING
November - June

PROPAGATION TECHNIQUE
Easy from fresh seed, rooted pieces and semi-hardwood cuttings. An unusual plant that makes an excellent ground cover in sunny, free draining sites. Does not like much shade. Once established very drought tolerant. An intriguing plant that also makes a great pot plant.

THREATS
Most abundant within the north eastern South Island. It is highly threatened in the North Island and appears to be extinct around Lake Taupo. Small populations persist in the Hawkes Bay, southern Wairarapa and south Wellington coastline. In the South Island it appears to have suffered little obvious decline but it is rarely common. In some areas its past presence can be determined by hybrid swarms that exist between it and other New Zealand Muehlenbeckia species.

ETYMOLOGY
muehlenbeckia: Named after a botanist named Muehlenbeck
ephedroides: Like ephedra, the horse-tail rush

ATTRIBUTION
Fact sheet prepared by P.J. de Lange for NZPCN (1 June 2013)

NZPCN FACT SHEET CITATION
Please cite as: de Lange, P.J. (Year at time of access): Muehlenbeckia ephedroides Fact Sheet (content continuously updated). New Zealand Plant Conservation Network.
https://www.nzpcn.org.nz/flora/species/muehlenbeckia-ephedroides/ (Date website was queried)

MORE INFORMATION
https://www.nzpcn.org.nz/flora/species/muehlenbeckia-ephedroides/

Raoulia monroi

Close up. Photographer: Cathy Jones

A close up of foliage. Photographer: Cathy Jones

COMMON NAME
fan-leaved mat daisy

SYNONYMS
Raoulia cheesemanii Beauverd

FAMILY
Asteraceae

AUTHORITY
Raoulia monroi Hook.f

FLORA CATEGORY
Vascular – Native

ENDEMIC TAXON
Yes

ENDEMIC GENUS
Yes

ENDEMIC FAMILY
No

STRUCTURAL CLASS
Herbs - Dicotyledonous composites

NVS CODE
RAOMON

CHROMOSOME NUMBER
2n = 28

CURRENT CONSERVATION STATUS
2018 | Threatened – Nationally Vulnerable

PREVIOUS CONSERVATION STATUSES
2012 | At Risk – Declining | Qualifiers: DP, RR, Sp
2009 | At Risk – Declining | Qualifiers: DP
2004 | Gradual Decline

DISTRIBUTION
South Island: Nelson, Marlborough, Canterbury and Otago.

HABITAT
Lowland to upland open ground and rocky places, on river terraces and stabilised river gravel.

FEATURES
Stems prostrate, creeping and rooting; final branchlets ascending; forming close to open flat patches. Leaves closely distichously arranged, 2-3 mm. long, linear-oblong to oblong-spathulate, obtuse, sometimes apiculate; basal portion 3-nerved, membranous, clad in appressed white tomentum; apical portion spreading, involute; ventral surface ± densely clad in matted tomentum; dorsal surface with appressed dense to sparse tomentum. Capitula up to 5 mm. diam. Inner series of involucral bracts 3-5 × c.1 mm., linear-oblong, glabrous except for sparse hairs at tips, pale yellow-green, margins hyaline, obtuse tips usually dark brown. Florets more or less 15, female 8-10. Achenes c.1 mm long, papillate-pubescent; pappus-hairs slender, papillae very finely claviform, c.3.5 mm long, not thickened at tips

SIMILAR TAXA
Other Raoulia species. Leaves of R. monroi are arranged in one plane, in two rows along the stem.

FLOWERING
No information

FRUITING
No information

PROPAGATION TECHNIQUE
Easily grown from rooted pieces. Likes freely draining soil and hot sunny conditions. Intolerant of humidity.

THREATS
As a lowland to montane species of dry, open ground this species is vulnerable to compeition from taller, more aggressive weed species. Although exact details are not yet available there is some evidence that suggests this species has been lost from some parts of its range and is actively declining in others.

ETYMOLOGY
raoulia: Named after Étienne Fiacre Louis Raoul (23 July 1815–30 March 1852) who was a French naval surgeon and naturalist. He published a book Choix de plantes de la Nouvelle-Zélande ("Selected plants of New Zealand") in 1846. The genus was named after him by Joseph Hooker.
monroi: Named after Sir David Monro who was a 19th century New Zealand politician

ATTRIBUTION
Description adapted from Allan (1961).

REFERENCES AND FURTHER READING
Allan, H.H. 1961: Flora of New Zealand. Vol. I, Government Printer, Wellington.

MORE INFORMATION
https://www.nzpcn.org.nz/flora/species/raoulia-monroi/

Rytidosperma maculatum

SYNONYMS
Notodanthonia maculata Zotov

FAMILY
Poaceae

AUTHORITY
Rytidosperma maculatum (Zotov) Connor et Edgar

FLORA CATEGORY
Vascular – Native

ENDEMIC TAXON
Yes

ENDEMIC GENUS
No

ENDEMIC FAMILY
No

STRUCTURAL CLASS
Grasses

NVS CODE
RYTMAC

CHROMOSOME NUMBER
2n = 24

CURRENT CONSERVATION STATUS
2018 | Data Deficient

PREVIOUS CONSERVATION STATUSES
2012 | Not Threatened
2009 | Not Threatened
2004 | Not Threatened

DISTRIBUTION
Endemic. South Island, easterly from Marlborough to Otago

ETYMOLOGY
rytidosperma: Wrinkled seed
maculatum: From the Latin maculatus ‘blotched’

WHERE TO BUY
Not commercially available

MORE INFORMATION
https://www.nzpcn.org.nz/flora/species/rytidosperma-maculatum/

Carmichaelia vexillata

Photographer: Cathy Jones

Photographer: Cathy Jones

COMMON NAME
Dwarf broom

SYNONYMS
None

FAMILY
Fabaceae

AUTHORITY
Carmichaelia vexillata Heenan

FLORA CATEGORY
Vascular – Native

ENDEMIC TAXON
Yes

ENDEMIC GENUS
No

ENDEMIC FAMILY
No

STRUCTURAL CLASS
Trees & Shrubs - Dicotyledons

NVS CODE
CARVEX

CHROMOSOME NUMBER
2n = 32

CURRENT CONSERVATION STATUS
2012 | At Risk – Declining | Qualifiers: DP, RF

PREVIOUS CONSERVATION STATUSES
2009 | At Risk – Declining | Qualifiers: RF
2004 | Serious Decline

BRIEF DESCRIPTION
Rare low growing leafless shrub consisting of erect flattened yellow-green branches with a blunt orange or red tip. Branches 1.5-3 wide, grooved, tip rounded. Flowers pea-like, pink with darker streaks, in clusters. Fruit a dry sharp-tipped pod with many hard seeds and which does not split open.

DISTRIBUTION
Eastern South Island to South Canterbury and Otago.

HABITAT
Recent moraines, alluvium, river terraces, terrace risers, disturbed soils, and soils derived from schist parent material.

FEATURES
Dwarf, spreading broom, up to 15cm tall, 40cm wide. Stems stout, curved upwards or horizontal. Branchlets linear, 20-95mm long, 1.5-4mm wide, finely grooved, may be sparsely hairy when young, hairless at maturity; green-yellow, tips often red in winter. Simple leaves on seedlings and occasionally on mature plants, 4-7.5mm long, 2-4.5mm wide, with scattered hairs on both surfaces; leaves on flattened stems usually reduced to a hairless triangular scale. Flowers 4-5.5mm long, 2-2.5mm wide, in clusters of 2-3; purple with whitish margins, sometimes cream with purple veins; main petal upright and taller than lower petals, sepals hairless, tip of sepal long and pointed. Pod oblong, compressed, dark brown to black or light grey. Seeds 4-13 per pod, oblong, yellow to olive green with black mottling.

SIMILAR TAXA
Carmichaelia monroi, C. astonii, C. corrugata. C. vexillata has thin stems. The main flower petal is upright and taller than the two lower united petals. In C. monroi the main petal is smaller than the lower petals. C. astonii has hairy stems and is larger overall. C. corrugata has underground stems.

FLOWERING
October to March

FLOWER COLOURS
Cream, Purple

FRUITING
November to May

LIFE CYCLE
Seeds are possibly dispersed by wind and granivory (Thorsen et al., 2009).

PROPAGATION TECHNIQUE
Easy from fresh seed and semi hardwood cuttings. Dislikes humid climates.

THREATS
At threat from weeds and browsing animals which inhibit flowering and fruit set. However, it must be recognised that without browsing animals many of the habitats occupied by this broom would vanish due to weed regrowth. This species survival now requires a delicate balance of allowing some browsing to reduce weeds but not too much which will damage or even kill Carmichaelia.

ETYMOLOGY
carmichaelia: After Carmichael, a botanist

ATTRIBUTION
Fact Sheet prepared for NZPCN by P.J. de Lange 1 August 2003. Description based on Heenan (1995)

REFERENCES AND FURTHER READING
Heenan, P. B. 1995: A taxonomic revision of *Carmichaelia* (Fabaceae-Galegeae) in New Zealand (part I). *New Zealand Journal of Botany 33*: 455-475.
Thorsen, M. J.; Dickinson, K. J. M.; Seddon, P. J. 2009. Seed dispersal systems in the New Zealand flora. Perspectives in Plant Ecology, Evolution and Systematics 2009 Vol. 11 No. 4 pp. 285-309

NZPCN FACT SHEET CITATION
Please cite as: de Lange, P.J. (Year at time of access): Carmichaelia vexillata Fact Sheet (content continuously updated). New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/carmichaelia-vexillata/ (Date website was queried)

MORE INFORMATION
https://www.nzpcn.org.nz/flora/species/carmichaelia-vexillata/

Carmichaelia petriei

L. Pukaki, November. Photographer: John Smith-Dodsworth

At Lake Pukaki, November. Photographer: John Smith-Dodsworth

COMMON NAME
Desert broom

SYNONYMS
Carmichaelia petriei var. minor G.Simpson; Carmichaelia ramosa G.Simpson; Carmichaelia virgata Kirk

FAMILY
Fabaceae

AUTHORITY
Carmichaelia petriei Kirk

FLORA CATEGORY
Vascular – Native

ENDEMIC TAXON
Yes

ENDEMIC GENUS
No

ENDEMIC FAMILY
No

STRUCTURAL CLASS
Trees & Shrubs - Dicotyledons

NVS CODE
CARPET

CHROMOSOME NUMBER
2n = 32

CURRENT CONSERVATION STATUS
2018 | At Risk – Declining

PREVIOUS CONSERVATION STATUSES
2012 | Not Threatened
2009 | Not Threatened
2004 | Not Threatened

BRIEF DESCRIPTION
Yellowish shrub with untidy erect leafless branches. Branches rounded, 1-3.5mm wide, with long yellow tips. Flowers small, pea-like, pink, in small clusters. Fruit a drooping dry pod containing 1-4 hard mottled seeds.

FLOWER COLOURS
Violet/Purple, White

LIFE CYCLE
Seeds are possibly dispersed by wind and granivory (Thorsen et al., 2009).

ETYMOLOGY
carmichaelia: After Carmichael, a botanist
petriei: Named after Donald Petrie (1846 -1925), Scottish born Otago botanist

REFERENCES AND FURTHER READING
Thorsen, M. J.; Dickinson, K. J. M.; Seddon, P. J. 2009. Seed dispersal systems in the New Zealand flora. Perspectives in Plant Ecology, Evolution and Systematics 2009 Vol. 11 No. 4 pp. 285-309

MORE INFORMATION

https://www.nzpcn.org.nz/flora/species/carmichaelia-petriei/

Poa maniototo

Poa maniototo. Photographer: John Barkla

COMMON NAME
desert poa

FAMILY
Poaceae

AUTHORITY
Poa maniototo Petrie

FLORA CATEGORY
Vascular – Native

ENDEMIC TAXON
Yes

ENDEMIC GENUS
No

ENDEMIC FAMILY
No

STRUCTURAL CLASS
Grasses

NVS CODE
POAMAN

CHROMOSOME NUMBER
2n = 28

CURRENT CONSERVATION STATUS
2012 | Not Threatened

PREVIOUS CONSERVATION STATUSES
2009 | Not Threatened
2004 | Not Threatened

ETYMOLOGY
poa: Meadow grass
maniototo: Named after the Maniototo Plain in Central Otago, from the contracted Maori name manaio-o-toto. This name come from mania ‘plain’ and toto ‘blood’, meaning plain of blood. The location name is spelled variously maniototo and maniatoto, the latter being approved by the New Zealand Geographic Board.

WHERE TO BUY
Not commercially available.

REFERENCES AND FURTHER READING
Reed, A. W. (2002). The Reed Dictionary of New Zealand Place Names. Reed PUblishing. Auckland.

MORE INFORMATION
https://www.nzpcn.org.nz/flora/species/poa-maniototo/

Puccinellia raroflorens

Puccinellia raroflorens. Photographer: John Barkla

Puccinellia raroflorens. Photographer: John Barkla

COMMON NAME
Saltgrass

SYNONYMS
None

FAMILY
Poaceae

AUTHORITY
Puccinellia raroflorens Edgar

FLORA CATEGORY
Vascular – Native

ENDEMIC TAXON
Yes

ENDEMIC GENUS
No

ENDEMIC FAMILY
No

STRUCTURAL CLASS
Grasses

CHROMOSOME NUMBER
2n = 56

CURRENT CONSERVATION STATUS
2012 | Threatened – Nationally Critical | Qualifiers: CD, DP

PREVIOUS CONSERVATION STATUSES
2009 | Threatened – Nationally Critical | Qualifiers: CD, DP
2004 | Threatened – Nationally Critical

DISTRIBUTION
Endemic. South Island (Central Otago) and Stewart Island. Known from the salt pans of Central Otago and in coastal sites on Stewart Island (Paterson Inlet and Mason Bay).

HABITAT
A species of inland salt pans, salt slicks, and coastal salt encrusted sand depressions. It has aleo been collected from near barren, stony ground within an estuary.

FEATURES
Diminutive perennial grass forming diffuse matts up to 2 m diam. and 450 mm high. Plants usually partially covered in soil, rarely flowering with only the short, narrow, dull green leaves visible. Branching extravaginal. Leaf-sheath hairless, wider than leaf-blade, ribs few, distinct. Ligule 0.2-0.6 mm, obtuse or truncate, transparent. Leaf-blade 10-30 x 0.2-0.5 mm, hair-like, inrolled, sometimes curled, hairless, tips subacute, margins minutely scabrid. Culm entirely hidden by leaf-sheaths. Panicle rarely present, 10-16 mm, overtopped by leaves, bearing 12 spikelets. Spikelets 3-4(-4.8) mm, 4-6-flowered, green to brownish green. Glumes unequal, ovate, obtuse; lower 0.6-1 mm, 1-nerved, upper 1.1-1.4 mm, 3-nerved. Lemma 1.8-2.5 mm, 5-nerved, ovate-elliptic, hairless. Anthers 0.4-0.6 mm. Seeds 1.2-1.6 x 0.6-0.7 mm.

SIMILAR TAXA
This species can be distinguished from all other New Zealand Puccinellia Parl. in that it has extravaginal innovation shoots. Flowering plants are rarely seen. When present they differ from other Puccinellia in that the flowering panicles rarely overtop the surrounding leaves.

FLOWERING
November - January

FRUITING
November - February

PROPAGATION TECHNIQUE
Can be grown by the division of whole plants. Fresh seed should germinate easily.

THREATS
This species is seriously threatened throughout its known mainland range because of the encroachment of salt-tolerant weeds within the saline soil habitats of Central Otago. Its status on Stewart Island remains unclear being known from just two collections made from widely separated localities and 20 years apart.

ETYMOLOGY
puccinellia: After the italian botanist Benedetto Puccinelli (1808 - 1850).
raroflorens: From the Latin raro ‘sporadic’ and florens ‘flowering’

WHERE TO BUY
Not commercially available. A few plants are held by specialist growers.

ATTRIBUTION
Description modified from Edgar and Connor (2000).

REFERENCES AND FURTHER READING
Edgar, E.; Connor, H.E. 2000: Flora of New Zealand. Vol. V. Grasses. Christchurch, Manaaki Whenua Press. 650 pp.

MORE INFORMATION
https://www.nzpcn.org.nz/flora/species/puccinellia-raroflorens/

Ceratocephala pungens

Flat Top Hill , Central Otago, October 2004. Photographer: John Barkla

Galloway. Photographer: John Barkla

SYNONYMS
None

FAMILY
Ranunculaceae

AUTHORITY
Ceratocephala pungens Garn.-Jones

FLORA CATEGORY
Vascular – Native

ENDEMIC TAXON
Yes

ENDEMIC GENUS
No

ENDEMIC FAMILY
No

STRUCTURAL CLASS
Herbs - Dicotyledons other than Composites

NVS CODE
CERPUN

CURRENT CONSERVATION STATUS
2012 | Threatened – Nationally Critical | Qualifiers: DP, EF

PREVIOUS CONSERVATION STATUSES
2009 | Threatened – Nationally Critical | Qualifiers: EF, DP
2004 | Threatened – Nationally Critical

DISTRIBUTION
Endremic. South Island, Mackenzie Basin and Central Otago. Formerly known from the upper Waitaki River where it appears to be extinct.

HABITAT
A species of dry open ground, often amongst scabweed (Raoulia spp.) matts.

FEATURES
Tiny, tufted, rossett-forming, annual herb 1.5-2 cm tall. Leaves 4-8 x 3-10 mm, grey-green, finely woolly-hairy, spathulate in outline, trilobed, each lobe divided 2-3 times, into oblong segments. Flowers solitary, unstalked or on short stalks 2-5 mm long. Sepals 4-5 mm, linear-oblanceolate, woolly beneath. Petals yellow, as long as sepals, linear-oblanceolate. Achenes (fruits) 20-30, 3-4 x 1.5 mm, woolly-hairy; keel flattened, triangular, beak 1-1.5 mm, erect, straight and slender, tapering into a spine.

SIMILAR TAXA
None

FLOWERING
October - December

FLOWER COLOURS
Yellow

FRUITING
November - March

LIFE CYCLE
Spiny achenes are dispersed by attachment and possibly granivory (Thorsen et al., 2009).

PROPAGATION TECHNIQUE
Difficult. Should not be removed from the wild.

THREATS
At serious risk of extinction. The open scabweed habitats this species requires have, following the near demise of rabbits (as a consequence of the release of Rabbit calcivirus) been replaced by taller introduced and indigenous grasses. These grasses have all but replaced the relatively open habit Ceratocephala requires, so quickly that whole populations have disappeared within one growing season. If this trend continues unchecked then Ceratocephala pungens is likely to become extinct within the next 5-10 years.

ETYMOLOGY
pungens: Sharp-pointed

WHERE TO BUY
Not commercially available.

CULTURAL USE/IMPORTANCE
This unusual species is the only southern hemisphere representative of an otherwise northern hemisphere genus.

ATTRIBUTION
Fact sheet prepared for NZPCN by P.J. de Lange 1 September 2003. Description adapted from Garnock-Jones (1984) - see also de Lange et al. (2010).

REFERENCES AND FURTHER READING
de Lange, P.J.; Heenan, P.B.; Norton, D.A.; Rolfe, J.R.; Sawyer, J.W.D. 2010: Threatened Plants of New Zealand. Christchurch, Canterbury University Press. 471pp.
Garnock-Jones, P.J. 1984: *Ceratocephalus pungens* (Ranunculaceae), a new species from New Zealand. *New Zealand Journal of Botany 22*: 135-137
Thorsen, M. J.; Dickinson, K. J. M.; Seddon, P. J. 2009. Seed dispersal systems in the New Zealand flora. Perspectives in Plant Ecology, Evolution and Systematics 11: 285-309

NZPCN FACT SHEET CITATION
Please cite as: de Lange, P.J. (Year at time of access): Ceratocephala pungens Fact Sheet (content continuously updated). New Zealand Plant Conservation Network.
https://www.nzpcn.org.nz/flora/species/ceratocephala-pungens/ (Date website was queried)

MORE INFORMATION
https://www.nzpcn.org.nz/flora/species/ceratocephala-pungens/