



FLORA OF NEW ZEALAND
FERNS AND LYCOPHYTES

LOXSOMATACEAE



P.J. BROWNSEY & L.R. PERRIE

Fascicle 7 – MARCH 2015

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Cover image: *Loxosoma cunninghamii*, broadly ovate mature frond.

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Introduction

The family Loxsomataceae is represented in New Zealand by a single endemic genus and species which is confined to the northern part of the North Island. *Loxsoma cunninghamii* is a terrestrial fern with long-creeping rhizomes, marginal sori, urceolate indusia and exserted receptacles. Its closest relative is another monotypic genus, *Loxsomopsis*, which occurs in Central and South America. Based on current phylogenetic research, *Loxsoma* is one of only three endemic fern genera in New Zealand (alongside *Cardiomanes* and *Leptolepia*).

***Loxsomataceae* C.Presl, *Gefässbündel Farrn*, 31 (1847)**

Type taxon: *Loxsona* R.Br. ex A.Cunn.

Terrestrial ferns. Rhizomes long-creeping, bearing multicellular hairs. Fronds monomorphic, not articulated to rhizome. Laminae pinnate-pinnatifid to 3-pinnate-pinnatifid or rarely 4-pinnate at base, anadromous (NZ) or catadromous (not NZ), coriaceous, glabrous (NZ) or hairy (not NZ). Veins free. Sori terminal on veins at margins of lamina; paraphyses present; indusia urceolate; receptacles elongate and exserted, maturation of sporangia gradate. Sporangia with slightly oblique annulus, 64 spores per sporangium (NZ) or 128 (not NZ). Homosporous; spores trilete, tuberculate or rugose and pitted, lacking chlorophyll.

Taxonomy: A family of two genera and two species. The *Loxsomataceae* comprises terrestrial ferns with long-creeping rhizomes bearing hairs, marginal sori, urceolate indusia, exserted receptacles, sporangia with an oblique annulus, trilete spores and base chromosome numbers of 46 or 50.

The family includes two monotypic genera, *Loxsona* and *Loxsomopsis*. Relationships to Hymenophyllaceae, Davalliaceae, Dennstaedtiaceae and Cyatheaceae have all been suggested on the basis of morphology. Evidence from comparative flavonoid chemistry of *Loxsona* and *Loxsomopsis* indicated their isolated origins and rather distant relationship to Hymenophyllaceae and Cyatheaceae (Markham & Given 1979). However, molecular evidence (Pryer et al. 2004) suggested that *Loxsomataceae* is most closely related to the tree ferns, despite the lack of obvious supporting morphological, flavonoid or cytological similarities. Phylogenetic analysis by Korall et al. (2006) showed the family to be sister to a clade comprising *Culcita* and *Plagiogyria*, and that these three groups, together with *Thyrsopteridaceae*, are sister to the “core” tree ferns.

The family name was first published as *Loxsomaceae* (Presl 1847), but later corrected to *Loxsomataceae*. It has also been presented as *Loxomataceae* (e.g. Smith et al. 2006), based on the original published spelling of the genus *Loxoma*, a name attributed to Robert Brown but published by Cunningham (1837). However, that spelling was corrected to *Loxsona* by Hooker & Bauer (1842), which is now conserved (Brummitt 2011).

Distribution: One genus in Costa Rica and South America from southern Colombia to Bolivia (Lehnert et al. 2001), and the other in New Zealand. One species in New Zealand; endemic.

Biostatus: Indigenous (Non-endemic).

Table 1: Number of species in New Zealand within *Loxsomataceae* C.Presl

Category	Number
Indigenous (Endemic)	1
Total	1

***Loxsona* R.Br. ex A.Cunn., *Companion Bot. Mag.* 2: 366, t. 31, 32 (1837) nom. cons.**

as “*Loxoma*”

Type taxon: *Loxsona cunninghamii* R.Br. ex A.Cunn.

Etymology: From the Greek *loxos* (oblique), and *soma* (belt), a reference to the oblique or slanting annulus on the sporangium. On one of the type sheets at K (photo WELT E473/14) there is a label in Cunningham’s hand giving the derivation as “*Loxsona* λοξοσ *obliquus*, λωμα [in error for σωμα] *instita*, a belt”.

Terrestrial ferns. Rhizomes long-creeping, bearing multicellular hairs. Fronds monomorphic, not articulated to rhizome. Laminae 2-pinnate-pinnatifid to 3-pinnate-pinnatifid or rarely 4-pinnate at base, anadromous, herbaceous to coriaceous, glabrous. Veins free. Sori terminal on veins at margins of lamina; paraphyses present; indusia urceolate; receptacles elongate and exserted, maturation of sporangia gradate. Spores trilete, rugose and pitted.

Distribution: One species endemic to New Zealand.

Biostatus: Indigenous (Endemic).

Table 2: Number of species in New Zealand within *Loxsona* R.Br. ex A.Cunn.

Category	Number
Indigenous (Endemic)	1
Total	1

Cytology: $n = 50$ (Brownsey 1975). This number, and $n = 46$ in *Loxsomopsis* (Kramer 1990), are unusual base numbers for ferns and are not easily aligned with those in related families.

Notes: *Loxsonoma* is one of only three endemic fern genera in New Zealand. It is distinguished from *Loxsomopsis* by its more highly divided fronds, which can be tinged blue-green or white on the underside, are glabrous, and have the basal basiscopic secondary pinnae longer than the acroscopic on the basal primary pinnae.

***Loxsonoma cunninghamii* R.Br. ex A.Cunn., Companion Bot. Mag. 2: 366, t. 31, 32 (1837)**

Lectotype (selected by Allan 1961): New Zealand, A. *Cunningham s.n.*, 1826, BM 000905149 (image!)

Etymology: Named in honour of Allan Cunningham by Robert Brown in an unpublished manuscript. His description was later published by Cunningham and the name attributed to Brown. Allan Cunningham (1791-1839) was a plant collector for Kew and colonial botanist in New South Wales.

Rhizomes long-creeping, 2–6 mm diameter, bearing dark, stiff, multicellular hairs 2.5–5 mm long. Fronds 370–1270 mm long. Stipes 150–700 mm long, chestnut-brown, glabrous or hairy at very base, polished. Laminae pinnate-pinnatifid at apex to 3-pinnate-pinnatifid or rarely 4-pinnate at base, ovate or broadly ovate, 180–570 mm long, 160–425 mm wide, yellow-green on adaxial surfaces, usually glaucous on abaxial surfaces or sometimes green, herbaceous to coriaceous, glabrous. Primary pinnae in 7–15 pairs, widely spaced, elliptic or narrowly ovate at lamina apex to ovate or broadly ovate at base of rachis; the longest at the base, 130–420 mm long, 80–230 mm wide, long-stalked. Secondary pinnae elliptic or narrowly ovate at apex to ovate at base of primary pinna, the longest 65–160 mm long, 25–90 mm wide, stalked to decurrent; the basal basiscopic longer than the acroscopic on the lowermost primary pinnae. Longest tertiary pinnae 27–60 mm long, 8–30 mm wide, decurrent. Sori terminating veins at margins of lamina, borne at notches of ultimate segments; indusia urceolate; paraphyses present as multicellular trichomes; sporangia borne on a short receptacle 1–3 mm long, projecting beyond the indusia at maturity.

Distribution: North Island: Northland, Auckland.

Altitudinal range: 0–550 m.

Loxsonoma cunninghamii occurs in lowland areas of Northland, Auckland and the Coromandel Peninsula, extending from near Kaitiaki to Whangamatā, with an outlying population on Maungatautari Mountain in the Waikato region. It occurs from near sea level extending up to 500 m in the Mataraua Forest and 550 m on Great Barrier Island.

Biostatus: Indigenous (Endemic).

Habitat: Occurs under tall mānuka and kānuka scrub, on scrub margins, in clearings, or in open tawa, podocarp, kauri and broadleaved forest, usually on banks, tracksides, roadsides or streamsides where it often spreads vegetatively. It has also been recorded occasionally under *Pinus* plantations.

Recognition: This species is easily recognised by its creeping rhizomes, ovate fronds with white or glaucous undersides, marginal sori and urceolate indusia with exserted receptacles.

Cytology: $n = 50$ (Brownsey 1975).

Notes: The species is less common than formerly, having been much reduced in distribution in Northland by land development. It is still abundant in Coromandel.

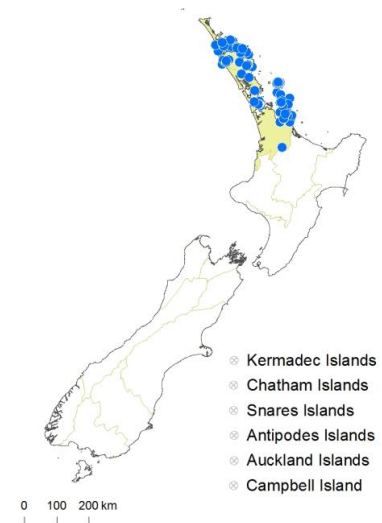


Fig. 1: *Loxsonoma cunninghamii* distribution map based on databased records at AK, CHR and WELT.



Fig. 2: *Loxsoma cunninghamii*: broadly ovate mature frond.



Fig. 3: *Loxsoma cunninghamii*: mature plants growing on a bank.



Fig. 4: *Loxsoma cunninghamii*: glaucous underside of fertile frond, with sori and urceolate indusia on lamina margins.

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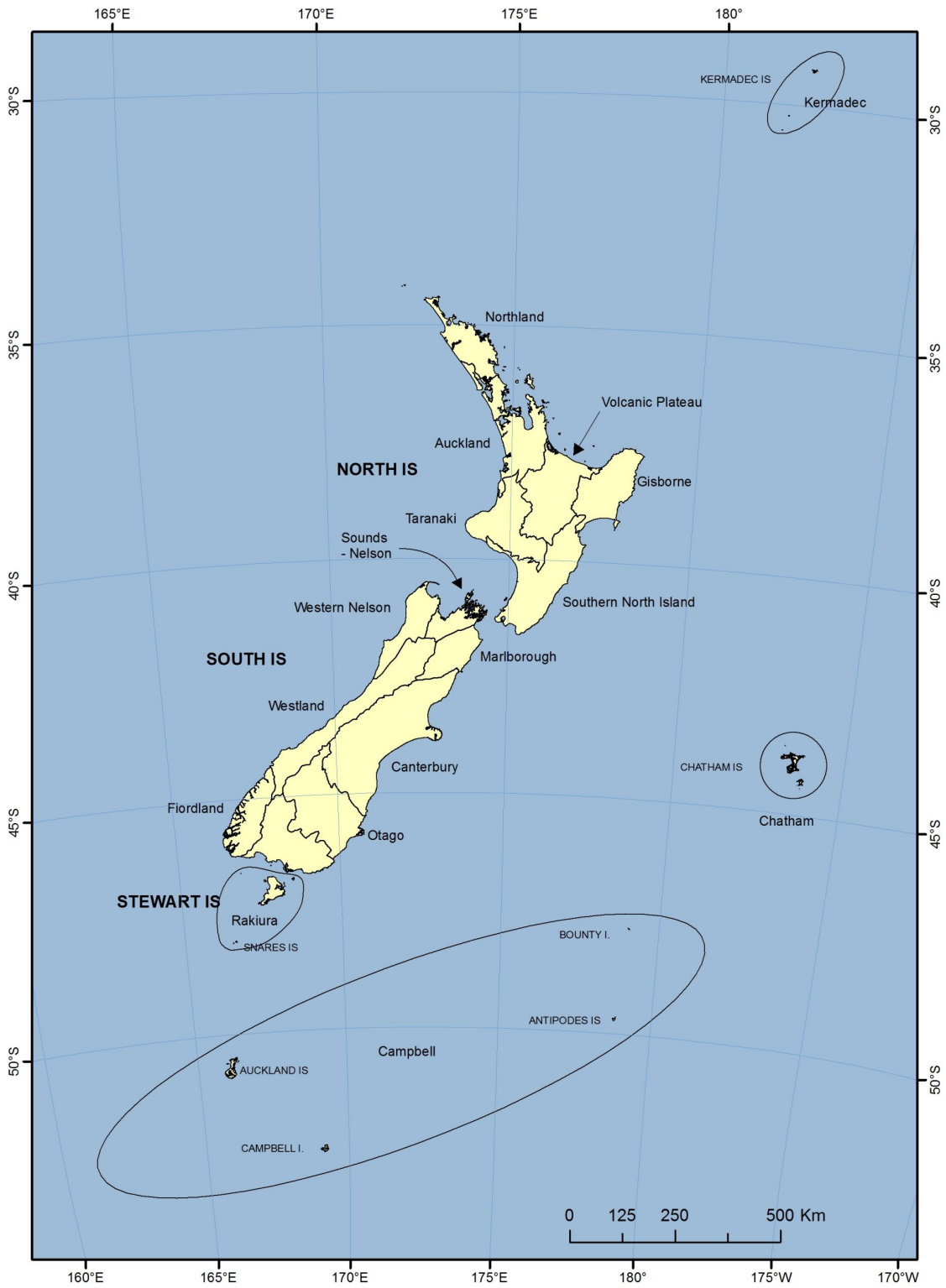
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P.J. Brownsey and L.R. Perrie

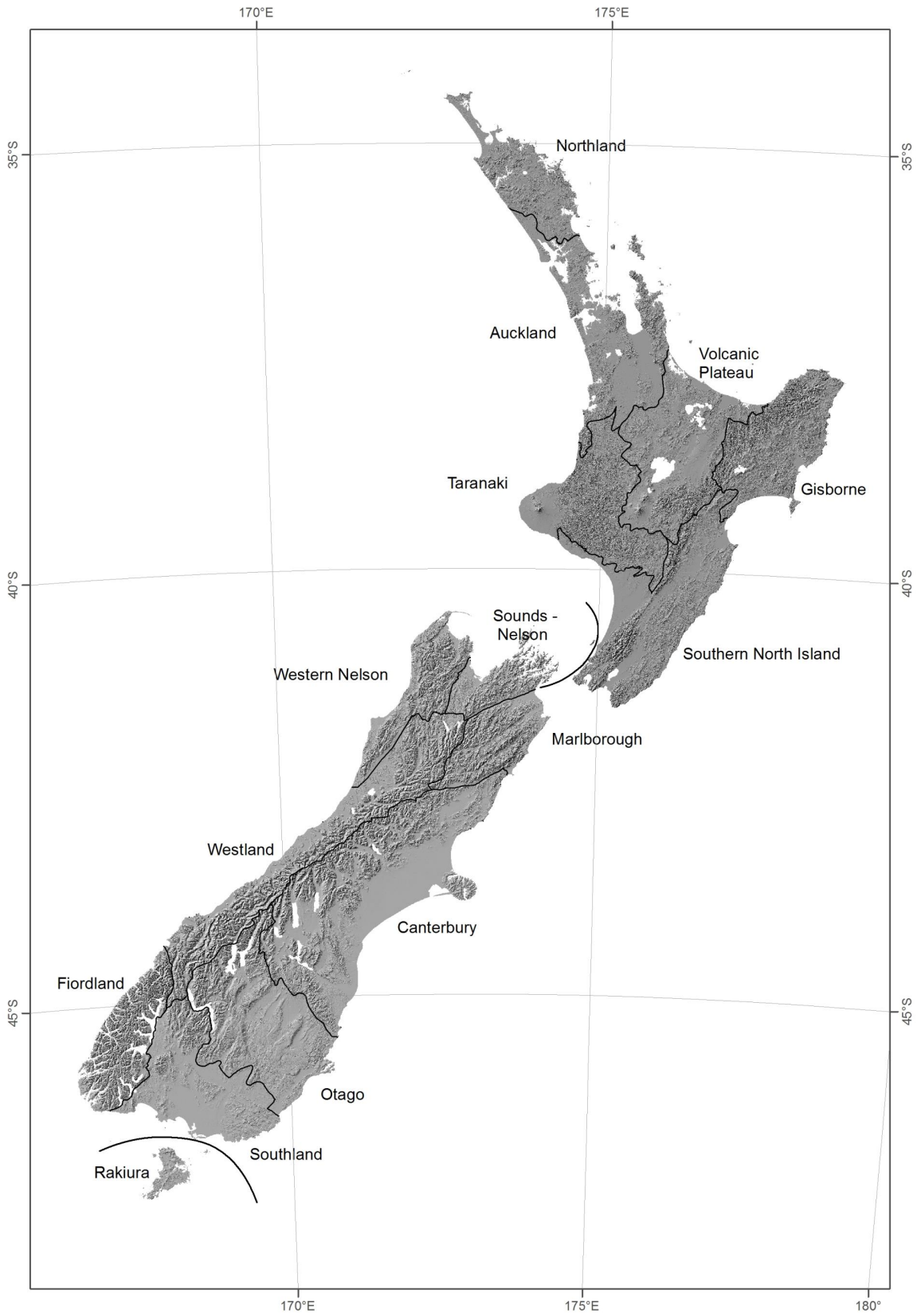
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Map 1: Map of New Zealand and offshore islands showing Ecological Provinces



Map 2: Map of New Zealand showing Ecological Provinces

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Page numbers are in **bold** for the main entry,
and *italic* for synonyms.

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