Threatened Plants Selected for the Hauora Garden of Health and Happiness

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Made on the New Zealand Plant Conservation Network website – www.nzpcn.org.nz

Introduction

This book was compiled from information stored on the website of the New Zealand Plant Conservation Network (www.nzpcn.org.nz).

This website was established in 2003 as a repository for information about New Zealand's threatened vascular plants. Since then it has grown into a national database of information about all plants in the New Zealand botanic region including both native and naturalised vascular plants, threatened mosses, liverworts and fungi.

Funding to develop the website was provided by the New Zealand Government's Terrestrial and Freshwater Biodiversity Information System Programme (TFBIS).

The species information used on the website has come from a variety of sources. The indigenous vascular plant text was written largely by Dr Peter de Lange (former Network Vice President). Peter based the descriptions on a wide range of sources including the Flora of NZ Series (Allan 1961, Moore and Edgar 1970 and Webb et al 1987) as well as numerous other taxonomic treatments. For a full bibliography of information sources see the References at the end of this book.

Where no published treatment was available Peter used herbarium specimens and his own knowledge of the flora to prepare species pages. Various other contributors have provided text and additional information to many species pages including botanists such as Mike Thorsen, John Barkla, Cathy Jones, Simon Walls, Nick Singers and many others. The threatened fungi text was written by Eric Mackenzie and Peter Buchanan (Landcare Research).

More than 200 photographers have kindly provided images to illustrate the website and for use in this book especially John Smith-Dodsworth, Jeremy Rolfe, Peter de Lange, Wayne Bennett and Gillian Crowcroft.

The New Zealand Botanic Region

The information on the Network website, from which this book was compiled, is for species that are indigenous to or naturalised within the New Zealand Botanic Region as defined by Allan (1961). The New Zealand botanic region encompases the Kermadec, Manawatawhi/Three Kings, North, South, Stewart Island/Rakiura, Chatham, Antipodes, Bounties, Snares, Auckland Campbell island/Motu Ihupuku and Macquarie.

About the Network

The Network has more than 800 members worldwide and is New Zealand's largest non-governmental organisation solely devoted to the protection and restoration of New Zealand's indigenous plant life.

The vision of the New Zealand Plant Conservation Network is that '*no indigenous species of plant will become extinct nor be placed at risk of extinction as a result of human action or indifference, and that the rich, diverse and unique plant life of New Zealand will be recognised, cherished and restored*'.

Since it was founded in 2003 the Network has undertaken a range of conservation initiatives in order to achieve its vision.

That work has included:

- Training people in plant conservation
- Publishing plant books, reports and posters
- Raising money for the David Given Threatened Plant Research Trust to pay for plant conservation research scholarships
- Advocacy to raise awareness of the importance of plant life in general and especially New Zealand's status as a Global Centre of Plant Diversity
- Lobbying central and regional government and business to protect indigenous plant life
- Educating people about plant life through the Network website
- Connecting people through the monthly newsletter, the Network conference and the annual general meeting

What is a threatened plant?

The NZ Threatened Plant Committee was formed in 1991 and ever since then it has met at regular intervals to review the status of indigenous vascular plants. It is made up of a small group of botanists that between them have an extensive knowledge of the native plants of New Zealand. This group is chaired by Dr Peter de Lange of the New Zealand Department of Conservation.

This committee applies a set of criteria to each native plant to determine its conservation status. The resulting list of species classified as threatened is published in the NZ Journal of Botany (see for example de Lange et al. 2009). The main threat categories used are: Extinct, Critical, Endangered, Vulnerable, Declining. Other categories used are: Recovering, Relict, Naturally Uncommon, Coloniser, Vagrant and Data Deficient. For vascular plants the threat status used in this book is taken from the 2009 conservation assessment (see de Lange et al 2009).

More recently other committees have been established to review the status of non-vascular plants but their lists are yet to be published.

Astelia grandis

Common Name(s):
Swamp astelia

Current Threat Status (2012):
Not Threatened

References and further reading:

Jones, S. 1995. *Astelia grandis* (swamp astelia) in the Waitakere Ranges. Auckland Botanical Society Journal, 50: 37-38.

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

For more information, visit:
http://nzpcn.org.nz/flora_details.asp?ID=1530

Caption: Astelia grandis
Photographer: Wayne Bennett

Caption: Turoa rd, Mt Ruapehu, February
Photographer: John Smith-Dodsworth

Clianthus maximus

Common Name(s):
Kakabeak, Kowhai Ngutu-Kaka, Kaka Beak

Current Threat Status (2012):
Threatened - Nationally Critical

Distribution:
Endemic. North Island. Formerly on Great Barrier Island. Still present in scattered populations from the East Coast of the North Island from Te Araroa south to the northern Hawkes Bay and east to the Te Urewera National Park.

Habitat:
Like the closely related C. puniceus (G.Don) Sol. ex Lindl. this species prefers early to mid successional shrubland habitats dominated by flax (Phormium cookianum Le Jolis, and P. tenax J.R.Forst et G.Forst) and tutu (Coriaria arborea Lindsay) in coastal, lowland and montane habitats. Often found along the tops and bases of unstable cliff faces or rock falls. Some habitats may not be natural, as this species, was said to have been grown by Maori, and many inland associations occur in the vicinity of former pa, kainga, gardens or canoe haul outs.

Features*:
Shrub 1.5-6 m tall. Wood soft, stems "watery" easily broken. Branchlets semi-erect to weakly ascending, often decurved. Leaves 15-25 cm long, imparipinnate, with 15-30 pairs of subsessile leaflets. Leaflets, dark green, upper surface shiny (very glossy) 150-300 mm, linear-oblong, apex retuse or rounded. Inflorescences racemose, 15-30-flowered, located in leaf axils near branch apices. Flowers 80 mm, dark scarlet. Standard ovate-acuminate, 60 mm, dark scarlet, with a dark maroon (almost black blotch) and usually lacking stripes (these if present indistinct, often dotted; wings 30 mm long, lanceolate-falcate; keel 60 mm long, falcate-acuminate, dark scarlet. Pods long persistent, 80 mm, at first green and turgid, drying black and splitting open for entire length. Seeds numerous, c.1-1.5 mm diam, grey various striped or blotched with black, embedded in wispy grey, floccose hairs.

Caption: Roadside population ex Te Araroa
Photographer: R.J. Stanley (2001)

Caption: Roadside population ex Te Araroa
Photographer: R.J. Stanley (2001)

Flowering:
May flower throughout the year. However plants are mostly found in flower between August and January

Fruiting:
Seed pods may be present at any time of the year

Threats:
Though more widespread than C. puniceus this species is now at a very serious risk of extinction. Only 153 mature plants are known from the wild and at all sites they are threatened by a diverse range of introduced browsing animals, diseases, and natural senescence. Many populations occur in low scrub where they are threatened by fire, weed control operations, natural succession, and the unstable, erosion prone nature of the habitats in which they grow.

***Attribution:**
Fact sheet prepared for NZPCN by P.J. de Lange 1 October 2003. Description adapted from Heenan (2000).

References and further reading:
Heenan, P.B. 2000: *Clianthus* (Fabaceae) in New Zealand: a reappraisal of Colenso's taxonomy. *New Zealand Journal of Botany 38(3)*: 361-371

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

For more information, visit:
http://nzpcn.org.nz/flora_details.asp?ID=59

Euphorbia glauca

Common Name(s):
shore spurge, sea spurge, waiu-atua, sand milkweed

Current Threat Status (2012):
Declining

Distribution:
Endemic to New Zealand and the Chatham Islands.

Habitat:
Coastal cliffs, banks and talus slopes, sand dunes and rocky lake shore scarps.

Caption: Euphorbia glauca at Ninety Mile Beach
Photographer: Bill Campbell

Features:
Perennial herb with multiple erect stems up to 1 m tall and underground rhizomes. Stems reddish; leaves alternate, blue-green. Flowers in terminal bunches, each flower surrounded by a deep red cup-like structure with purple glands. Sap a burning milky juice. Flowers are produced from October to February and fruit occur from December to May.

Caption: Mana Island
Photographer: John Sawyer

Flowering:
September to March (sporadic flowering throughout the year can occur)

Fruiting:
December to July

Threats:
Domestic and feral cattle, sheep, pigs and possums are the major threats throughout this species range, mainly through browse and trampling. Competition from taller vegetation is significant at many sites. Coastal development (e.g., road widening) and erosion are further common threats to most populations. Population fragmentation makes the remnants vulnerable to sudden decline. Some populations on the West Coast of the South Island appear to have succumbed to a fungal disease.

References and further reading:

Benham, S. 2001. Field trip to Hauturu little Barrier island March 2001 and a few observations of Waiuatua shore spurge (*Euphorbia glauca*). Auckland Botanical Society Journal, 56: 10-43

For more information, visit:
http://nzpcn.org.nz/flora_details.asp?ID=125

Hebe speciosa

Caption: Hebe speciosa
Photographer: Wayne Bennett

Caption: Flower of Hebe speciosa
Photographer: Wayne Bennett

Common Name(s):
Napuka, Titirangi

Current Threat Status (2012):
Threatened - Nationally Vulnerable

Distribution:
Endemic. North and South Islands. In the North Island known only from west coast. Formerly from Scots Point to Urenui. In the South Island from several sites in the Marlborough Sounds. Now only known from outer South Head (Hokianga Harbour), Maunganui Bluff, near Muriwai Beach, at two sites on cliffs west of Aotea Harbour, Mokau and at Titirangi Bay (Marlborough sounds). Recently it has been suggested that only the outer South Head, Maunganui Bluff and Muriwai populations are natural, the others resulting from past deliberate cultivation by Maori.

Habitat:
Coastal cliffs and headlands, in low windswept scrub and flaxland. Rarely under taller trees.

Features*:
Spreading to somewhat sprawling shrub up to 2 x 3 m. Branches stout, becoming woody at base, spreading to sprawling, rarely erect, often layering on contact with ground. Branchlets stout, pliant, glabrous, yellow-green to green, internodes variable in length, though much longer than stem diameter. Leaf-bud with distinct sinus, glabrescent. Petiole stout, fleshy 5-20 mm. Leaves numerous, coriaceous, fleshy to almost succulent, glabrescent except of lamina margin, 50-200 x 25-80 mm, dark green, green to yellow-green and glossy above, much paler beneath, broadly elliptic to obovate-oblong or oblong, apex obtuse, often retuse, base obtuse; lamina margin distinctly enlarged, red-pigmented, finely pubescent. Inflorescence a simple, lateral, erect raceme 30-80 x 30-40 mm. Peduncle robust, fleshy, glabrous, 30-50 mm long. Flowers rather fleshy, rather crowded on raceme. Pedicels 2-8 mm, exceeding the bracts. Bracts narrowly subulate, ciliolate. Calyx-lobes 2-3 mm long, greenish-yellow to dark green, subacute, ciliolate. Corolla-tube and lobes dark magenta or red, 4-5 x 3-5 mm, exceeding calyx, lobes 5-6 mm long, obtuse, ciliolate. Capsules stout, robust, 6 x 4 mm, brown to dark brown, broadly ovate, apex acute, coriaceous.

Flowering:
Hebe speciosa may be found in flower throughout the year.

Fruiting:
Fruit is usually present throughout the year.

Threats:
Threatened by weed invasion of its coastal habitat, browsing animals, and genetic pollution through planting of other hebe sp. and cultivars in the vicinity of wild populations. DNA based research has discovered that populations south of West Auckland (Muriwai) stem from deliberate past Maori plantings of this attractive red-flowered species (Armstrong & de Lange 2005). These plantings resulted from the movement of a limited amount of material from South Head, Hokianga, and as such these southerly populations lack sufficient genetic variability to sexually maintain themselves.

***Attribution:**
Fact sheet prepared for NZPCN by P.J. de Lange 1 October 2006. Description based on Bayly & Kellow (2006).

References and further reading:

Armstrong, T.T.J.; de Lange, P.J.2005: Conservation genetics of *Hebe speciosa* (Plantaginaceae) and endangered New Zealand shrub. *Botanical Journal of the Linnean Society* 149: 229-239.

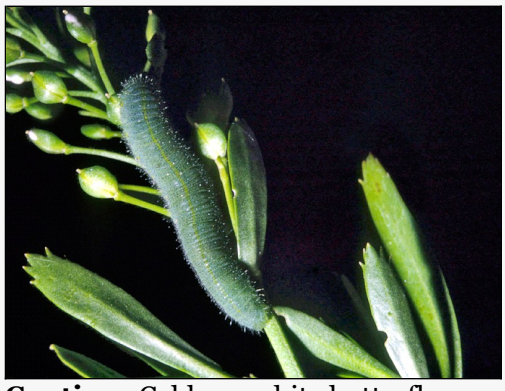
Bayly, M.J.; Kellow, A.V. Hebes, identification, classification and biology. Wellington, Te Papa Press

Bodley, F.A. 1961. *Hebe speciosa* in the Marlborough Sounds. Wellington Botanical Society Bulletin, 32: 9

For more information, visit:
http://nzpcn.org.nz/flora_details.asp?ID=66

Lepidium oleraceum

Caption: Albugo infestation on leaf. Ex Mana Island. Feb 1986.
Photographer: Colin Ogle



Caption: Cabbage white butterfly larva on Lepidium oleraceum in cultivation. Feb 1986.
Photographer: Colin Ogle

Common Name(s):
Nau, Cooks scurvy grass

Current Threat Status (2012):
Nationally Endangered

Distribution:
Endemic. New Zealand, Kermadec Island group, Three Kings Island group, North, South, Stewart Islands and the Bounty Islands group.

Habitat:
Now strictly coastal, L. oleraceum is usually found in friable well manured soils, guano deposits, or rock crevices associated with seabird roosts and nesting sites. Occasionally it grows under taller vegetation, and then usually near petrel or shear water burrows. The species is now mainly found on rock stacks, islets, and windshorn headlands on rodent free offshore islands. In some places it has been found growing on sand or gravel beaches, and in one location it grows on boulders and clay that are part of an artificial sea wall. Historically this species was also known from the upper Waitaki Valley, well inland from the sea. This suggests that before human occupation it was once more widespread away from coastal situations.

Features*:
Glabrous, much-branched, perennial, herb up to 1 x 1 m, usually less. All parts strongly pungent when bruised. Stems erect to decumbent, stout, somewhat woody near base, flexuous. Petioles winged of variable length. Leaves 20-100 x 15-40 mm, decreasing in size toward stem apices, dark green to green, fleshy, somewhat succulent, narrow-oblanceolate, obovate to elliptic, margins, deeply and evenly serrated, cuneately narrowed at base. Inflorescences racemose, terminal and lateral, usually leaf-opposed 30-150 mm at fruiting; pedicels erecto-patent, 3-10 mm long at fruiting. Flowers fragrant. Sepals 1-2 x 0.5-1 mm. Petals white, 2.5-3.5 x 0.5-2 mm, obovate-spathulate. Stamens 4, yellow. Silicles 3-5 x 2.5-5 mm, broadly ovate, truncate at base, apex acute, not winged; style 0.1-0.2 mm; seeds 1.5-2 mm, ovoid, orange-brown

Flowering:
Flowers appear year-round, but mainly from September to March.

Fruiting:
Fruiting occurs from December to April. Seed production is rapid so flowers, immature and ripe seed capsules are often found on the same plant.

Threats:
Seriously threatened by loss of indigenous sea bird nesting grounds because it is dependent on high-fertility soils and regular cycles of animal induced disturbance. It is susceptible to a range of introduced pests and diseases, including rodents, snails, aphids, leaf miner, diamond back moth and cabbage white butterfly, and is browsed by cattle and other livestock. A fungus-like disease (Albugo candida (J.F.Gmel.) Kuntze) is also a problem; and the plant has been and continues to be over-collected by people.

***Attribution:**
Description adapted from Webb et al. (1988).

References and further reading:

Allan, H.H. 1961. *Flora of New Zealand. Volume I. Indigenous Tracheophyta: Psilopsida, Lycopsida, Filicopsida, Gymnospermae, Dicotyledones.*Wellington, Government Printer.

Sawyer, J.W.D., de Lange, P.J. 2007. *Lepidium oleraceum* - a threatened herb of coastal Wellington. Wellington Botanical Society Bulletin, 50: 30-36

Webb, C.J.; Sykes, W.R.; Garnock-Jones, P.J. 1988. Flora of New Zealand. Volume IV. Naturalised Pteridophytes, Gymnosperms, Dicotyledons.Christchurch, New Zealand, Botany Division, D.S.I.R.

For more information, visit:
http://nzpcn.org.nz/flora_details.asp?ID=71

Pomaderris hamiltonii

Caption: Ex. cult Kaiaua Road, November 1992
Photographer: G. M. Crowcroft

Caption: Ex. cult Kaiaua Road, November 1992
Photographer: G. M. Crowcroft

Common Name(s):
Pale-flowered kumarahou

Current Threat Status (2012):
Naturally Uncommon

Distribution:
Endemic. North Island only, vicinity of Warkworth and Omaha, near Kaiaua and Miranda and on Great Barrier Island

Habitat:
Coastal to lowland in open successional habitats and shrubland. Often found along roadside cuttings where the constant disturbance provides an ideal habitat.

Features:
Shrub to small tree 3-6 m tall. branches upright rarely spreading, branches slender, bark dark brown, finely rugose. Seedling leaves dark green and glossey above, pale, and dull beneath, margins finely toothed. Leaves of seedlings, juveniles and adults petiolate, petioles pliant, dark green to brown green, somewhat rugose, at first finely covered in stellate hairs, trending to glabrous with age. Adult leaves 20 -80 x 10-40 mm, dark green above (not glossey), pale grey-green beneath, elliptic to elliptic-ovate; upper surface glabrous except for sparse, simple hairs present toward the sunken midrib; lower surface covered with fine, grey stellate indumentum, with larger simple and stellate veins on midribd and veins; margins entire, sometimes revolute; stipules 4-5 mm long, caducous. Inflorescence a terminal, open, many-branched corymb. Calyx reflexed, pale greenish; tube with scattered long, white, simple hairs until after anthesis. Petals cream; limb broad. Anthers oblong. Ovary with stellate hairs at apex, wholly immersed in calyx tibe at anthesis, ½ immersed at fruiting. Fruit cocci opening by percula, occupying ½ of their inner faces.

Flowering:
(August-) October (-November)

Fruiting:
(November-) December - January

Threats:
Many populations occur on roadside cuttings where they are at constant risk from road maintenance crews, roadside spraying, and road widening. Some populations have been lost through natural succession

For more information, visit:
http://nzpcn.org.nz/flora_details.asp?ID=306

Ptisana salicina

Common Name(s):
King fern, Para, Tawhiti para, Horseshoe fern

Current Threat Status (2012):
At Risk - Declining

Distribution:
Indigenous to New Zealand and the South Pacific (possibly elsewhere). In New Zealand it is found throughout the north-western half of the North Island from inland Wanganui northwards. The Waikato is probably its stronghold where it is known from many remnants and forested areas in the west.

Habitat:
Favouring lowland, karst habitats (cave entrances and tomo shafts) and dark stream sides, often amongst supplejack (Ripogonum scandens) and parataniwha (Elatostema rugosum).

Features*:
A large, robust fern with fronds to 5 m tall arising from a stout, starchy base that was a traditional food for the Maori. The cane-like leaf stalks are green, 1–3 m long, and have a large basal, ear-like lobe that protects the uncoiling frond. The dark glossy green (or yellow-green in stressed sites) fronds are up to 4 m long by 2 m wide. The frond pinnules are entire, oblong, strap-like, and taper towards the tip. Midribs of the secondary pinnae are swollen at the junction with the main stem. The spores are arranged in distinctive boat-shaped sori. The juvenile fronds are less robust, wilting easily on exposure to sunlight, with the strap-like pinnules often lobed or serrated. An unusual form with crested tips to the adult pinnules is sometimes found in the wild around the Kawhia area.

Flowering:
Specimens of suitable age may produce sporangia at any time.

Threats:
Feral and domestic stock, wild pig and goat browse are serious threats throughout its range. Indeed large specimens are only found where there has been intensive animal control, in inaccessible cave and tomo entrances or in steep-walled limestone gorges. Aside from animals the most serious threat to this species comes from plant collectors who have been responsible for the recent loss of several large, reasonably accessible populations near Kawhia.


Caption: Ptisana salicina
Photographer: Wayne Bennett


Caption: Ptisana salicina
Photographer: Wayne Bennett

***Attribution:**
Fact Sheet prepared for NZPCN by P.J. de Lange 1 August 2003.

References and further reading:
Murdock, A.G. 2008: A taxonomic revision of the eusporangiate fern family Marattiaceae, with description of the new genus *Ptisana*. *Taxon 57(3)*: 737-755

For more information, visit:
http://nzpcn.org.nz/flora_details.asp?ID=133

Sonchus kirkii

Caption: In cult. ex Awhitu.
Photographer: John Braggins

Caption: Ex cult. Kariotahi
Photographer: Gillian Crowcroft

Common Name(s):
Puha, shore puha, New Zealand sow thistle

Current Threat Status (2012):
Declining

Distribution:
Endemic. Three Kings, North, South, Stewart and Chatham Islands.

Habitat:
Coastal. Usually on cliff faces in or around damp seepages where it often grows with the blue green alga Nostoc and fern Blechnum blechnoides. This species has a distinct preference for base rich rocks such as basalt, calcareous mudstones, siltstones, limestone or apatite-rich greywacke faces. On some offshore islands this species extends up into coastal scrub and herbfield. It occasionally grows on stabilised sand dunes. Indications are that this species once occupied a wider range of habitats but has retreated to those less suited to other faster growing introduced weeds.

Features:
Biennial to perennial herb (50-)150-600(-1000) mm tall. Taproot stout and swollen above. all parts exuding white latex when ruptured. Stem erect, simple or branched, finely grooved and ribbed, glabrous, hollow. Leaves thick, dull glaucous, lanceolate to narrowly oblong or linear oblanceolate (30-)80-200(-550) x (10-)30-60(-150) mm, margins dentate. Rosette and lower stem leaves pinnatifid to c.1/2 way to midrib; lobes broadly triangular, spreading or deflexed. Upper leaves not lobed, narrowly triangular to linear, or narrowly oblanceolate. Inflorescence cymose to umbellate. Capitula few to many. Involucre 10-15 mm , turbinate to cylindric, bracts imbricate, recurved at fruiting. Florets yellow. Achenes elliptic, brown, strongly flattened, (3-)4 x1-1.8 mm, 3-ribbed on each face, winged, wings and ribs smooth. Pappus hairs, fine, white.

Flowering:
August - April

Fruiting:
September - June

Threats:
Appears to be declining over most of its range but especially in the North Island. The main threat seems to be from competition by faster growing weed species. Specifically there is some evidence that suggests it may be outcompeted by the introduced sowthistles Sonchus asper and S. oleraceus which grow faster, and thus can more quickly colonise the habitats preferred by S. kirkii. The species has also declined markedly along the south Wellington coast. Here it was once very common up until the mid 1980s subsequently it has disappeared from many of its former haunts, partly as a result of weed invasion and quarrying for rock, but it has also vanished from apparently stable, mainly indigenous habitats. The exact reason(s) for this loss are as yet unclear.

References and further reading:
Cameron, E.K. 2000. Native sow thistle *Sonchus kirkii* rediscovered in the Auckland region. Auckland Botanical Society Journal, 55, 21-24.

For more information, visit:
http://nzpcn.org.nz/flora_details.asp?ID=205