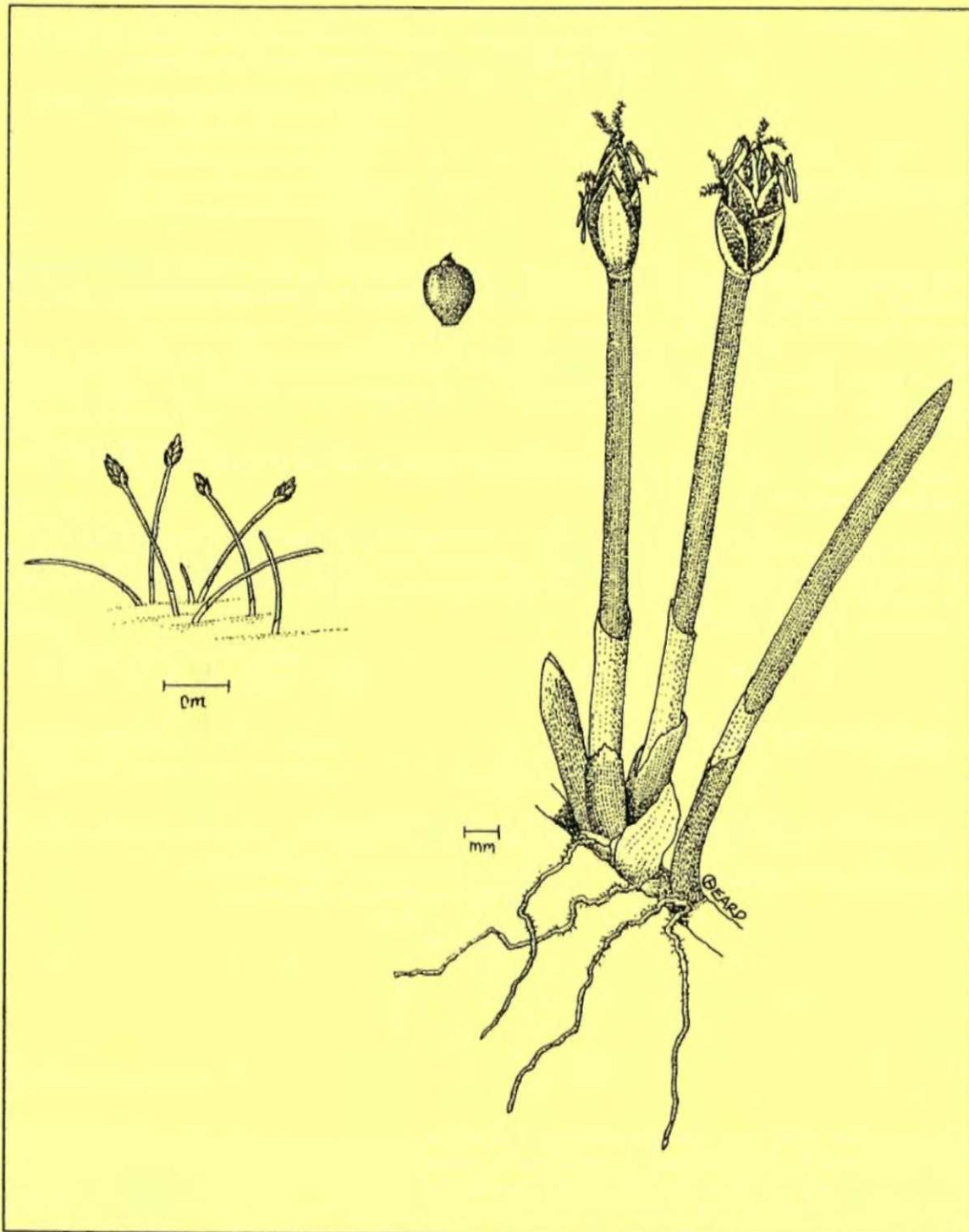


NEW ZEALAND BOTANICAL SOCIETY

# NEWSLETTER

NUMBER 39

MARCH 1995



## **New Zealand Botanical Society**

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### **Subscriptions**

The 1995 ordinary and institutional subs are \$14 (reduced to \$10 if paid by the due date on the subscription invoice). The 1995 student sub, available to full-time students, is \$7 (reduced to \$5 if paid by the due date on the subscription invoice).

Back issues of the *Newsletter* are available at \$2.50 each - from Number 1 (August 1985) to Number 38 (December 1994). Since 1986 the *Newsletter* has appeared quarterly in March, June, September and December.

New subscriptions are always welcome and these, together with back issue orders, should be sent to the Secretary/Treasurer (address above).

Subscriptions are due by 28 February of each year for that calendar year. Existing subscribers are sent an invoice with the December *Newsletter* for the next year's subscription which offers a reduction if this is paid by the due date. If you are in arrears with your subscription a reminder notice comes attached to each issue of the *Newsletter*.

### **Deadline for next issue**

The deadline for the June 1995 issue (Number 40) is 31 May 1995.

Please forward contributions to: Bruce & Beverley Clarkson, Editors  
NZ Botanical Society Newsletter  
7 Lynwood Place  
HAMILTON

NEW ZEALAND BOTANICAL SOCIETY  
**N E W S L E T T E R**  
NUMBER 39 MARCH 1995

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**Cover illustration**

*Eleocharis neozelandica* a small leafless sedge of coastal sandy margins of dune lakes and tidal creeks and damp sandy flats or hollows amongst dune sands; classified as "vulnerable" (see Revised Threatened and Local Plant Lists, p. 15) Drawn by **Catherine Beard**, Herbarium Keeper at the Biological Sciences Department, University of Waikato. From a plant grown on from Te Arai, Aupouri Peninsula, Northland (voucher AK 221723).

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## NEWS

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### New Zealand Botanical Society News

#### ■ Balance sheet for the financial year 01 January - 31 December 1994

INCOME		EXPENDITURE	
B/fwd from 1993	4555.62	Printing Newsletter 34	1106.85
1994 Subscriptions	3312.00	Postage Newsletter 34	185.60
1994 Student Subscriptions	22.00	Printing Newsletter 35	826.88
Donations	339.00	Postage Newsletter 35	184.00
Back Issue Sales	222.50	Printing Newsletter 36	826.88
Subs in advance	92.00	Postage Newsletter 36	180.00
Advertising	50.00	Printing Newsletter 37	877.50
Interest chq a/c	.23	Postage Newsletter 37	176.00
Interest investment a/c	<u>167.05</u>	Printing Newsletter 38	1102.50
	8760.40	Postage Newsletter 38	176.00
		ECO Subscription	100.00
		Bank fees	<u>.50</u>
			5742.71

Excess income over expenditure of \$3017.69 (represented by chq a/c balance of \$15.57 and investment a/c balance of \$3002.12) carried forward to 1995. Note that payments for *Newsletter 34* (December 1993) were not processed until early 1994 although they relate to the 1993 year.

Anthony Wright, Treasurer, New Zealand Botanical Society

January 1995

### Regional Botanical Society News

#### ■ Manawatu Botanical Society

##### Past Trips and Meetings

A Keeble's Bush work party in August weeded *Muehlenbeckia australis* from under pine trees that will be cut down this summer. *Muehlenbeckia* is rampant in some canopy gaps and margins of this forest. The damp ground was ideal for this task and many metres of meandering *Muehlenbeckia* were duly uprooted, and some interesting theories advanced on the species. *M. australis* is nearly deciduous and the stems were practically leafless at this time. However a discussion was entered into on the fact that the juvenile leaves are very small while the mature form has leaves that may be up to 7cm. Michael Greenwood observed that on the Chatham Islands juvenile and adult leaves are the same size. Could it be that small leaves in the juvenile form developed on the main islands as a survival mechanism to be overlooked by the browsing moas, whereas in the Chathams, devoid of moas, small juvenile leaves had no special survival value?

In September Anthony Cole, a PhD student in the Geography Department, Massey University, gave us an account of his fascinating eight week expedition to the beautiful Fijian island of Totoya. Project Totoya was funded by the American National Geographic and resulted primarily from the research interests of American archaeologist Dr. Jeff Clark who has been studying the settlement, prehistory and migratory movements of the Polynesian people in the central Pacific for some years. Anthony was invited to join the project and used palynology (fossil pollen analysis) to reconstruct the island's vegetation history with particular emphasis on the identification of vegetation disturbances related to human settlement of the island (ca. 2400 years BP).

Anthony removed six sets of core samples from mangrove swamps located on the island's coastal plain, believed to have been formed as a result of falling sealevel after the late Holocene sealevel rise (ca. 3000 years ago). These cores have not yet been carbon dated but their origin on the coastal plain suggests that the fossil pollen record contained in these sediments covers ca. 2000-2500 years.

To aid in the interpretation of the fossil pollen record, Anthony also surveyed the contemporary vegetation. Five main vegetation classes were identified, all of which were of low diversity.

1. Mangrove Forest - only two species present (although seven species occur in the Fiji group of islands), *Bruguiera gymnorhiza* and *Excoecaria agallocha*. The seeds of *Bruguiera* are valued by the Fijian people as a food source and this may explain its introduction to the island. *Bruguiera gymnorhiza* is also reported to have allelopathic tendencies which prevents the germination and growth of seeds underneath the mature trees as well as re-colonisation of other species following forest clearance.

2. Coastal Zone Vegetation - Anthony suggested that this association may be of human origin and cited the ethnobotanical importance of some species as evidence. The coastal zone association has low compositional affinity with other vegetation classes on the island, grows on the coastal plain (developed about the time of human settlement), and is of low diversity composed mainly of trees, a few herbs and several lianes. Trees of ethnobotanical importance include the Dilo (*Calophyllum inophyllum*) which yields a much-prized liniment-oil; the Ivi (*Inocarpus fagiferus*) which bears a chestnut-flavoured seed; the Vitu (*Barringtonia asiatica*) with seeds that when crushed were traditionally used to stupefy fish; and the Tavola (*Terminalia catappa*) with hard timber used for ceremonial drums. Finally, the coastal zone is also extensively planted in coconut plantation (*Cocos nucifera* - several cultivars) and some food crops.

3. The Cibicibi forest - only remnants of this forest remain on the island and many of those are located on upland ridges. In his survey of this forest Anthony found only 11 tree species (the most abundant of which was *Manaltoa brevipes* - the Cibicibi), two grass species and one fern.

4. The Cau forest - the Cau tree (pronounced 'thou') *Casuarina equisetifolia* grows in association with the Fijian reed grass (*Miscanthus floridulus*). Only a few of these forests were observed growing on exposed ridgelines close to the rear of coastal plains.

5. Talasiga - the Fijian grassland association, is composed predominantly of the reedgrass Gasau (*Miscanthus floridulus*) growing in association with a lower stratum of forbs (non-graminaceous herbaceous species). Ferns were abundant, notably bracken (*Pteridium esculentum*) as were lianes. The fossil pollen record indicated that grassland vegetation has been introduced on Totoya within the time period covered by Anthony's mangrove cores (ca. 2500 years). He suggested that the arrival of the grassland vegetation probably resulted from forest clearance following human settlement. Evidently, grassland vegetation is not considered to be a climax vegetation for Fiji since it reverts to secondary forest if left undisturbed - its persistence suggests ongoing disturbance. The forest vegetation declines over the period of the fossil pollen record and coincides with peaks in charcoal fragment influx which is indicative of forest burning during a time of known human settlement. Carbon dating and other lines of evidence are now needed to support these conclusions - ideas which are hotly debated in the literature at the present time. While much of the vegetation of Totoya is highly modified, it is very desirable that the few relatively undisturbed areas should be protected. However, for the people of Totoya, conservation has traditionally had a low priority. The village people responded well to the idea of setting up reserves, but so far Anthony has made slow progress with the Government officials responsible for conservation. We were able to get a very good idea of the main regions of vegetation on the island with excellent slides illustrating the contrasting zones, and a video showing both vegetation and fascinating glimpses of village life by Barbara Latch.

In September we joined with the Wanganui Botanical Group to visit Omarapapaku (Round Bush) and the Himatangi Bush Scientific Reserve on Paranui Road in the Manawatu, under the expert guidance of John Barkla from the Wanganui DoC office.

In October Lynette Fisher recounted her experiences of United Kingdom gardens and the Chelsea flower show with a magnificent record of her trip in albums of photographs and associated leaflets of the many gardens she visited in England and Ireland.

In October a trip to the Hidden Lakes in Wairarapa, created by a large landslip during the 1855 earthquake, was of interest. As was a trip to Mana Island, partly in pursuit of Cook's scurvy grass, *Lepidium oleraceum*.

In November Cathy Foster, who is working on her MSc in heather ecology in the Department of Ecology at Massey University, told us about the heather problem at Tongariro National Park. As part of her research, Cathy has been setting up experiments to monitor heather growth in various parts of the Park. In one set, she has been spray-painting heather shoots, harvesting some, and then leaving the others for a year, prior to another harvest, and measurement of intervening growth. She has found that growth is rapid throughout

the park, but particularly so in areas where the invasion is relatively recent. She has also been attempting to predict the likely consequences on heathland communities of introduction of the proposed biocontrol agent, European heather beetle. This little beetle and its larvae defoliate heather and are responsible for large areas of heather dieback in Europe, where it is seen as a pest. Cathy has set up an experiment where she mimics heather beetle browse, by stripping foliage off some plants within monitored quadrats, and measuring changes in the proportion of other species in the community. The hope is that natives, particularly tussocks, will do better if heather is under stress. Cathy has also tried treatments where heather is cut and left lying on her quadrats, which is the way most other researchers have tried to estimate the effects of heather death. She has also tried leaving or removing foliage from the quadrats, imitating the addition or removal of nutrients to the ecosystem in beetle frass. In all of these treatments, which she has been following for two years, the clear winners are heather, which rapidly resprouts from cut stems or seeds into newly opened areas, and hawkweed (*Hieracium pilosella*), an exotic daisy which forms dense mats and rapidly invades any bare soil. The natives appear to respond too slowly to take advantage of any openings in the canopy.

Another interest of Cathy's is the genetic structure of heather populations in the Park, which she is investigating via starch gel electrophoresis, a technique which lets her look at the diversity of individuals within and between populations. She is also interested in calculating the demographics (age patterns) of various heather communities.

#### Forthcoming meetings

(7.30 pm Seminar Room Biology Building Massey University)

March 16	Yvette Cottam and Steve Pilkington on Little Barrier Island
April 6	Claire Murphy on pollination ecology in Tongariro National Park
May 4	Jill Rapson on a Northland excursion, Waipoua and beyond
June 1	Peter van Essen on 'A Spenser Mountains Crossing - Lewis Pass to Nelson Lakes'

#### Forthcoming trips

March 18	Moonshine Valley forest remnants
April 22	Mikimiki Walkway Wairarapa
May 6	Keebles Bush forest monitoring work party
June 10	Mystery trip

**Peter van Essen and Jill Rapson**, Department of Ecology, Massey University, Private Bag 11222, Palmerston North

#### ■ **Nelson Botanical Society**

##### November field trip: Brown River and Carluke Scenic Reserve

The walk in through the beech forest from the main road at The Brown yielded a treasure trove of ferns. Several orchids were in flower including *Pterostylis banksii*, *P. graminifolia* and *P. cardiostigma*. An interesting test was distinguishing pepperwood (*Pseudowintera colorata*) seedlings from *Alseuosmia pusilla* with the bite test! We came across unusual *Melicope simplex* up to 1.5 m tall clothed almost entirely in trifoliate leaves. Up slope in dense cathedral-like stands of tawa many solitary young fronds of *Diplazium australe* were appearing from winter dormancy. At Carluke in the dense stand of matai, we encountered a vast array of divaricating and small-leaved shrubs and even two parasites (*Korthalsella lindsayi* and *Ileostylus micranthus*). The most interesting shrubs were *Coprosma rubra* and *Teucrium parvifolium* and hybrids between *Melicopus micranthus* and mahoe (*M. ramiflorus*). *Blechnum membranaceum* and hybrids between it and *B. chambersii* were also present.

##### December field trip: Moa Park

Little time was spent botanising en route so most time could be devoted to exploring the clearing at Moa Park. A good range of alpine plants were in flower including abundant *Caladenia lyallii*, *Oreostylidium subulatum*, *Celmisia incana* and *C. spectabilis*. The spaniards (*Aciphylla colensoi*) were especially spectacular. Each new corner of the area yielded new species but perhaps the find of the day was a blue flowered form of a small *Myosotis*.

##### Christmas field trip report: Inland Kaikoura/Clarence River

A party of five stayed at Coverham. The first day was a trip along the Chalk Range, an area in short grassland with some silver tussock and a few patches of totara forest in deep steep gullies. The find of the morning was *Myosotis arnoldii*, perched on a cliff ledge. Along the top we encountered a wide range

of alpine including abundant *Stackhousia minima* (in flower). In the afternoon we returned along the foot of the range, sighting several large stands of *Olearia hectori* along three streams.

On the second day we ventured into the Mead Stream gorges. These are spectacular limestone gorges with abundant *Pachystegia* and weeping broom (*Notospartium carmichaeliae*) and a wide range of rock plants and shrubs including *Pseudopanax ferox*, *Sophora prostrata*, *Hebe traversii* (in full flower) and alpine such as *Celmisia monroi* and *Ranunculus insignis*.

The third day was spent close to base in mountain beech with some red and silver beech and pockets of rimu and miro. The rocky bluffs yielded a few native grasses and *Ophioglossum coriaceum*.

On the fourth day we visited the flanks of Tapuaenuku an ascent through lightly grazed short tussock grasslands with an increasing element of alpine herbs and shrubs, particularly around the rocky outcrops. In the morning the key finds were the thick stemmed *Helichrysum coralloides* and the local endemic *Ewartia sinclairii*. On the scree finds included *Wahlenbergia cartilaginea*, *Myosotis traversii* (in flower) *Stellaria roughii* (in flower) and the stags horns of *Lobelia roughii*. It was not until we were on the descent down a scree that we finally saw plenty of the penwiper (*Notothlaspi rosulatum*).

On the next day we explored the Nidd stream up to the Zoo, a circular clearing. Apart from a few huge *Olearia hectorii* it was too modified to attract much interest. Surrounding it on limestone was species-rich red beech forest with only one notable find, a hybrid between *Aristotelia serrata* and *A. fruticosa*. On the return we spent quite a bit of time examining the large stands of *Olearia hectorii* found earlier. It was pleasing to see over 1000 plants of a wide range of ages from seedlings to adults up to 60 cm in diameter, mostly forming large stands.

On the last day we had to visit the Clarence. Near the mouth of the Ouse huge cliffs had abundant rock daisies (*Pachystegia*) in flower and one brilliant plant of *Notospartium carmichaeliae* in full flower. Dense species-poor kanuka and manuka stands flank the river but after re-crossing the river at the Gibson we ascended to the ridge again through black beech, matai and putaputaweta in a wet gully.

#### January field trip: Parachute Rock

The lower part of the track in red beech forest contained a diversity of shrubs, but attention focused on the abundance of *Gastrodia cunninghamii* in full flower. As the track began to ascend David Jackson made the find of the day - saplings of *Pittosporum patulum*. Species diversity declined markedly in the mountain beech forest until near treeline when the alpine herbs began to appear. In the grasslands the sweet scented, creeping herb, *Pratia macrodon*, was in full flower. Other plants of interest in the grasslands were the small *Aciphylla crenulata* and *Hebe* aff. *rigidula* and *H. canterburiensis*, species we don't often see. Many species were in full flower, the most spectacular was probably *Celmisia incana*. At the ridge a few scree plants were present. These included *Notothlaspi rosulatum*, *Parahebe cheesemani*, *Haastia bryoides* and *H. sinclairii*.

#### Anniversary weekend camp report: Collingwood

A group of 25 descended upon Collingwood for the weekend. On the Saturday we ascended Mt Burnett. On the lower slopes we added quite a few species to the list and admired some of the larger tree complexes on pukatea with crowns including puka (*Griselinia lucida*), *Metrosideros diffusa*, *M. perforata* or *M. robusta*. Each tree contained a real tangle of "hangers on". Distinguishing *Ascarina lucida* (with hair-like stipules) from pukatea seedlings also proved a test of skills. Near the quarry *Jovellana repens* was common and further up we encountered *Hebe townsonii*, *Myrsine* "Burnett" and *Meliclytus* "Burnett". At the first summit a small rock outcrop revealed *Senecio glaucophyllus* and *Pimelea longifolia* in flower, *Brachyglottis greyi* and a glaucous form of *Rytidosperma setifolium*. At the saddle between the peaks, on sandstones, the vegetation changed to silver, yellow-silver and pink pine, hard and mountain beech.

On Sunday we headed for the Kaituna Track. At the beginning of the track we saw the uncommon *Pseudopanax edgerleyi*, then *Gahnia xanthocarpa* with flower panicles nearly 5 m tall. A little further on the banks were lined with the black crowns of *Blechnum nigrum* or patches of *Dawsonia superba*. In the rock crevices amongst the glowworm threads the tiny lacy *Trichomanes colensoi* was hidden and further on we found *Trichomanes strictum*. Along the river *Hymenophyllum atrovirens* was noted on the wet shaded banks.

We also visited the Aorere Goldfields and Druggans Dam. The start of the track passes through low manuka-kanuka shrublands with a good range of sedges and rushes, including *Lepidosperma australe*, *Schoenus tendo*, *Juncus pallidus*, and *Baumea teretifolia*. The ground cover was often dominated by the

almost moss-like, sprawling *Lycopodium laterale*. Among the grasses the uncommon *Sieglingia decumbens* was quite common. In wetter places the small flowered *Pratia*-like *Hypsela rivalis* formed quite dense tangled mats. Among the unusual ferns were *Lindsaea linearis* and huge plants of *Schizaea fistulosa*, some found over 1 m tall. In the forest by the caves a rich northern rata, pukatea forest with kiekie and supplejack understorey discouraged exploration. Perhaps the most interesting find was *Hymenophyllum rufescens*, a species of warm, wet forests.

#### Waitangi weekend camp report: Kaikoura

On Saturday we headed up Mt Fyffe. The about 700 m a host of montane and alpine plants were in full flower. They included *Brachyglottis monroi*, *Olearia cymbifolia*, the broad-leaved snow tussock, and huge 2 m tall flower spikes of *Aciphylla glaucescens*. At about 1000 m species included *Coprosma acerosa* var "brunnea", *Coriaria plumosa* and a good range of hebes including *H. aff. rigidula*, *H. traversii*, *H. venustula*, *H. carnosula* and *H. glaucophylla*. At the hut the main finds were *Heliohebe raoulii* and *Myrsine nummularia*, the latter with huge purple berries. The grasslands soon gave way to scree or rocks and herbfields dominated by the large leaved form of *Celmisia spectabilis* (var *grandis*). Amongst the rocks we saw *Corallospartium crassicaule*, *Hebe decumbens*, *H. cheesemanii*, *Pimelea aridula* and *P. traversii*. At about 1 km past the summit the first scree plants were reached. These included *Stellaria roughii*, *Epilobium rubra-marginatum*, *Leptinella atrata* and *Lobelia roughii*. The *L. roughii* was in flower but the greatest fascination was with the huge seed capsule. Amongst the rocks there was edelweiss in flower and on the most stable areas mobs of the small vegetable sheep (*Raoulia bryoides*). There were also many of the spectacular *Gentiana corymbifera* in full flower.

On Sunday it drizzled so we tackled the Peninsula Walkway. The coast has only a few small pockets of shrubland containing a large component of adventive such as elder (*Sambucus nigra*). The species list was strongly dominated by species from the grasslands and included such common garden species as silver beet (*Beta vulgaris*), turnips and cabbages. On the steepest cliffs the rock daisy (*Pachystegia insignis*) managed to survive alongside the native *Linum monogynum*. On the rocks even lush glasswort (*Sarcocornia quinqueflora*) was not safe from the ravages of sheep.

On Monday we visited Cemetery Bush. This remnant coastal forest is unique in the South Island for its canopy species and site. It is also contains some of the southernmost tawa. The canopy is dominated by maire (*Nestegis cunninghamii*), ngaio and mahoe and in the understorey *Lophomyrtus obcordata* was abundant. Species of interest included *Hoheria angustifolia*, *Coprosma areolata* and *Lastreopsis microsora*.

#### Forthcoming field trips

March 19	Mt Arthur
April 14-16 (Easter)	Reefton
May 21	Abel Tasman Coast

Graeme Jane, 136 Cleveland Terrace, Nelson

#### ■ Wanganui Museum Botanical Group

##### 29 October field trip: "Gray's Bush" in the Longacre Valley

This had been fenced off for about 10 years. There has been a great development of undergrowth during this time and 87 plants were listed. There was a considerable amount of *Fuchsia perscandens*, a shrub not common in this region. Among the plants in flower were *Clematis forsteri*, *Parsonsia capsularis*, *Corybas macranthus* and *C. trilobus*.

##### 10 December field trip: Lake Waiau near Waverley

Lake Waiau is a DoC reserve surrounded by private farms. The reserve totals 42 ha, mostly open water but with a large swamp at the northern end and a smaller swamp surrounding an island at the southern end. The swamps are dominated by flax with *Carex secta*, karamu and toetoe as common components. At the swamp/lake ecotone were *Baumea articulata*, *Sparganium subglobosum*, *Ranunculus macropus*, *Myriophyllum triphyllum*, *Ruppia polycarpa*, and *Hypolepis distans*. *Tmesipteris elongata* occurred on bases of *Carex secta* both here and at the nearby Ihupuku swamp, and this phenomenon warrants further study since both of these swamps are coastal dune swamps.

Another interesting find was *Eupatorium cannabinum* (hemp agrimony), an adventive species which was also recorded here. There have been only two previous records in New Zealand, at a swamp near Hawera in 1975 and at Ihupuku Swamp in 1993. More recently it has been found at Waipipi.

#### 28 January 1995 field trip: Hines bush near Mangamahu

This area of bush is part of Mt View farms and has been fenced off for a long time. Some logging had occurred. We were looking for plants in general but kept an eye open for *Dactylanthus*. *Korthalsella lindsayi* was found on *Melicope simplex*, a divaricating shrub which was plentiful in the area.

#### Forthcoming meetings

7 March	I. and J. Bell: "Wildflowers of the Stirlings, Western Australia"
4 April	Clive Higgie: Slides of travels to USA, Britain, Italy and France
2 May	Pat & Lou Robinson: Highlights of a trip to Israel, Greece, Egypt and California
6 June	Dr David Kelly: "Pollination of native mistletoes by birds"

#### Forthcoming trips

5 March	Tunnel Hill Farm revisited in the hope that the swamps will be more accessible and, time permitting, to Turakina beach to view plants of the dune hollows
1 April	Jean D'Arcy reserve on the road beyond Bushy Park on the Rangitatau East Road
30 April	Sutherland's Bush in the Turakina Valley
3 June	Hogg Park and the Papaiti Walkway in Wanganui
2 July	Rahui (Pryce's Bush) in the Rangitikei Valley near Rata

Meetings are held on the first Tuesday of each month in the Museum classroom, commencing at 8.00pm (summer time) or 7.30pm (winter time - April to September). Any queries to the Secretary - Robyn Oglé, 4 Brassey Road, Wanganui.

**Alf King**, 180 No.2 Line, RD2, Wanganui

#### ■ **Wellington Botanical Society**

##### Annual Field Trip to Croft Valley

The Croft Valley and the surrounding mountains are places that should be on all botanical/geological/tramping "must see" lists. It is a bit of an adventure getting there, especially if done in the dark and if the road has not been traversed before. There are many relatively easy tramps on good tracks to a wide diversity of botanical and geological sites. The less able or inclined are also catered for in a "Garden" that contains a good number of the less common plants from the area.

Whatever your favourite plant family, chances are you would find much to interest you. Orchids were well represented with *Pterostylis oliverii* and *P. irsoniana* vying with *Caladenia lyallii* as my favourites. Perching orchids were conspicuous by their absence up until the last day when some really massive rock outcrops above Gabbro Creek yielded both *Earina mucronata* and *E. autumnalis* growing alongside *Dendrobium cunninghamii*.

The alpenes around Lake Sylvester and Iron Lake, and Lake Peel on the other side of the valley, were accessible in a couple of hours by good tracks and had quite differing floras. A trip to Balloon Hut with some botanising around Lake Peel on the way was to have meant time for a much more thorough look on the return journey. This was not to be, as what started as a mean southerly gale deteriorated to blizzard conditions as the track down around the lake was reached. It was head down for some time for those with any sense but as we went over the top and down to relative shelter we encountered a small group determined that as long as they could see the plants through the snow they were going to botanize. *Myosotis macrantha* with its almost black flowers and *Cheesemanian latisiliqua* probably justified this. The ultramafic belt shows up really well up near the old asbestos mine with the bush much reduced and stunted and contrasting with growth off the ultramafics. Magnesite and chert have also been mined at various times and places and the access roads provide easy going to botanize these areas. *Myosotis brockei* and an unusual *Carex* sp. were found in these areas.

Some of the plants of note that come to mind are *Hymenophyllum malingii* which formed a beautiful grey cloak over old *Libocedrus bidwillii* stumps. *Libertia pulchella* with its dainty little flowers sprinkled throughout the beech forest. *Aciplylla polita* in full flower on the flats near Balloon Hut. *Epilobium margaretae* with its short fat seeds pods quite unlike its more common relatives. The beautiful mass flowering of *Pterostylis oliverii* (1 sq metre), the small, light blue flowered *Myosotis* near Iron Lake, and nobody could be less than impressed with the *Bulbinella* covering the slopes above Peat Swamp.

This is a very subjective view of the trip but I am not sure how anybody could be totally objective about such a lovely place.

#### Wellington Botanical Society Jubilee Award

The 1994 Jubilee Award of the Wellington Botanical Society has been made to Matt Todd, Plant and Microbial Sciences Department, Canterbury University. The full award of \$1,000 has been made to assist Matt with his study on the taxonomy of the genus *Haastia*. His travels will take him to a number of alpine sites from Fiordland to North West Nelson and the work will form a major part of the requirement for an MSc (Botany).

Congratulations to Matt and thanks to the other applicants and to the subcommittee who had the task of considering and choosing the successful applicant.

Pat Enright, PO Box 10412, Wellington

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## NOTES AND REPORTS

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### Plant/Fungi Records

- **The naturalised mushrooms of New Zealand, 2: *Agaricus augustus* Fries, in *Epicrisis systematis mycologici*, 212 (1838).**

Etymology: Latin *augustus*, majestic. Trivial name "the prince" (Phillips 1981).

Pileus 54-93 mm, convex to planar convex, margin entire and pileipellis slightly revolute, cinnamon to pale greyish sepia fibrils over sordid buff, darker at disc, smooth, dry, fibrous adpressed squamules, lifting slightly towards disc, slight yellow bruising with handling; flesh white, grey line above lamellae, vinaceous staining in angle between pileus and stipe, yellow stain developing on cut surface below pileipellis and above lamellae. Lamellae free, to 11 mm wide, at first white then very pale vinaceous, vinaceous buff and finally fuscous black. Stipe 45-63 mm high, 10-15 mm diam. at apex, 15-25 mm at base, subclavate, annulate, hollow, flesh white; annulus pendant, membranous, white turning fulvous with age; above annulus striate when young, slightly vinaceous then pale luteous-fulvous; below annulus fibrous with fibres lifting into girdling ridges, ridges disappearing with age, sordid white with buff staining. Spore print dark greyish sepia to fuscous black.

Spores 7.5-10.5 x 4.5-6.0  $\mu$ m, ellipsoid to sub-ovate, dark umber, thick walled. Basidia 16.6-22.6 x 6.8-9.1  $\mu$ m, clavate, 4-spored, without clamp connections. Cheilocystidia 10.6-22.6 x 7.5-12.1  $\mu$ m, globose, subglobose to clavate, in chains, with dull luteous pigment. Pileipellis a cutis of sub-regularly arranged hyphae; hyphae 6-10  $\mu$ m diam., very pale luteous. Clamp connections absent in all tissues.

Specimen examined: under mixed *Cupressus* spp., *Eucalyptus* spp. and *Pinus radiata* D. Don, Bay of Plenty, Rotorua, NZ FRI campus, Whakarewarewa Forest, 38°10' S 176°15' E, 8.xii.1993, M. Williams, NZFRI(M) 3529.

This collection of *A. augustus* fits well the descriptions of Heinemann (1986), Phillips (1981), Shepherd (1969), Rinaldi and Tyndalo (1972), and Svrcek (1983). This moderately large *Agaricus* species is easily recognised by the pale brown scales on the cap, and by the yellowing that occurs on handling and when the cap flesh is cut. In the Southern Hemisphere it has been reported from Patagonia where a single collection was made from under *Nothofagus dombeyi* and *N. pumilio* (Heinemann 1986), and from around Sydney, Canberra and Upper Colo in New South Wales where its habitat is reported as on soil or in woods (Shepherd 1969). In Europe it is associated with coniferous and deciduous forests (Phillips 1981, Rinaldi and Tyndalo 1972, Svrcek 1983). This single New Zealand collection was from a mixed species trial plantation behind the NZFRI campus so it is uncertain as to whether it was associated with any particular tree species. However, a water colour illustration in Thornevell (1992) may represent *A. augustus* growing under pines on Kawau Island?

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Geoff S. Ridley, New Zealand Forest Research Institute, Private Bag 3020, Rotorua

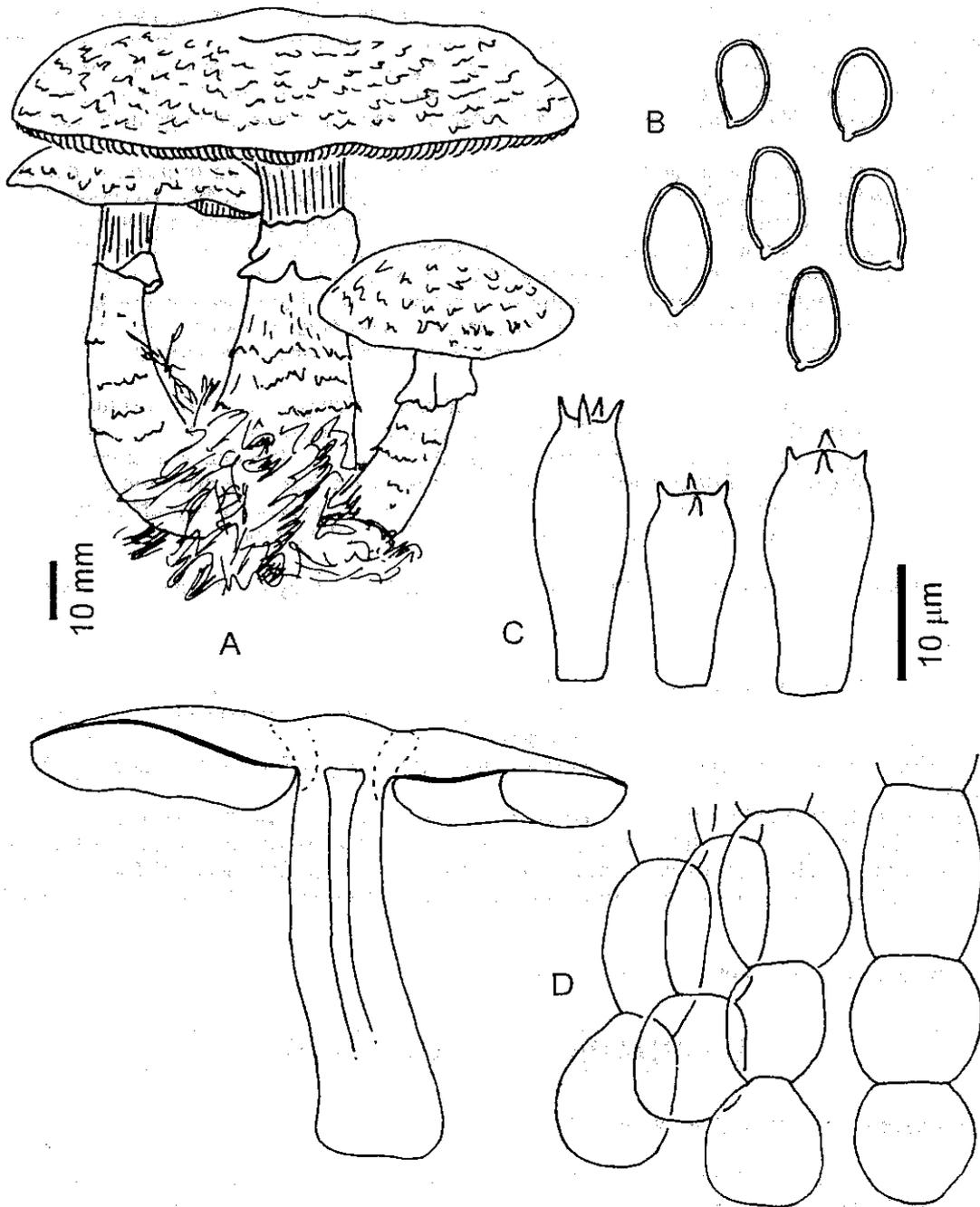


Figure 1: *Agaricus augustus*. A, habit and section of fruit body; B, spores; C, basidia; D, cheilocystidia.

## ■ Some new plant records from Whale Island (Moutuhora).

On Saturday 4 March 1995, a party of twelve from Rotorua Botanical Society undertook a long-awaited trip to Whale Island (Moutuhora) in glorious weather, with visits by some to the main hill (353m a.s.l.), and others to Pa Hill (189m). Three plant species - two native and one adventive - not recorded by Colin Ogle in 1985-1986 in the most thorough survey of the island's flora and vegetation to date (Ogle 1990), were encountered:

*Coprosma lucida* (karamu) - a large 2 m high female plant, fruiting heavily, grows beside the track on the Pa Hill ridge (lodged in NZFRI). No male plants were seen, and since *C. lucida* is reputed to hybridise with *C. robusta* (Allan 1961), also present on the island, the pollinating species in this case is uncertain. Two individuals of *C. lucida* epiphytic on mahoe (*Melicactus ramiflorus* ssp. *ramiflorus*) were recorded by F. Still (in Ogle 1990) in 1950 when goats (*Capra hircus*) were rampant; but since neither coastal karamu (*C. macrocarpa*) - the common large-leaved coprosma on the island - nor the much rarer *C. robusta* were noted at the time, Ogle (1990) cast doubt on the earlier record. The re-establishment as terrestrials of highly palatable species like *C. lucida* is directly attributable to the extermination of goats in 1977.

*Beilschmiedia tawa* (tawa). - a single 0.5m high seedling grows under kanuka (*Kunzea ericoides* var. *ericoides*)-mahoe forest near the summit of the main peak (small sprig lodged in AK). The species is quite common in semi-coastal forest (e.g., Ohope Scenic Reserve) on the adjacent mainland 8km distant, and has presumably been brought to Moutuhora by New Zealand pigeon (*Hemiphaga novaezealandiae*), its only known avian disperser (Knowles & Beveridge 1982). Pigeon have not been recorded from Whale Island (Butts & Potter 1993), but may visit from the adjacent mainland where they are widespread (Bull et al. 1985). In view of its value as a food source for birds, tawa is a welcome addition to the island's vegetation, and may in time become a small but significant canopy element in the developing forest.

*Lilium formosanum* (an adventive lily from Taiwan) - a small population grows just above high water mark on the beach at Boulder Bay (lodged in NZFRI). It was not present in December 1980 when the author last visited Moutuhora. Interestingly, the first record of this garden escape in New Zealand came from nearby Whakatane in 1972 (Healy & Edgar 1980); bulbs have presumably floated across the sea and been deposited at high water during a storm. A weedy adventive such as this is not a desirable addition to the island's flora, given the island's status as a wildlife refuge, and should be removed.

Plants of all these species are visible from major walking tracks, so may have been seen by previous visitors.

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Mark C. Smale, 8 Casper Street, Fairfield, Hamilton

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## BIOGRAPHY/BIBLIOGRAPHY

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### ■ Biographical Notes (17): William Willcox (1861-1944)

William Willcox, the son of Hannah and William Willcox (a gardener), was born at Woolsthorpe, Lincolnshire, on 11 September 1861. He arrived in New Zealand about 1880 and at age 25 married Frances Cox at Ashburton (1,2). In the Electoral Rolls for 1887, 1890, and 1893, he is listed as "gardener, residential, Allenton" [a northern suburb of Ashburton]; and in 1896 he is at Upper Riccarton, Christchurch, again as "gardener, residential". I could not find him or his wife in the next two Rolls.

On 21 July, 1903, Willcox was appointed to the temporary staff of the Department of Tourist and Health Resorts as Gardener, The Spa, Hanmer Springs (2,3,4). Here his wife died on 9 December, 1905, and was buried at the Jollies Pass Cemetery leaving 4 boys and 2 girls (5). Willcox's gathering of Cockayne's *Celmisia mollis* from "mountains near Hanmer" (6) probably dates from this time.

The Annual Report of the Department of Tourist and Health Resorts for 1906 (7) announced that the Park and Esplanade at Queenstown had been brought under Government control by special Act and was to be administered by the Department. The bowling green was also taken over from the local club and "works are now in hand for its improvement". On 6 June, 1906, Willcox was appointed Caretaker of the bowling green and Government Gardener at Queenstown (8,9). On 9 January, 1907, he married Frances Reid in Christchurch (10); and on 21 July, 1908, he was appointed to the permanent staff, becoming Head Gardener, Queenstown (2).

The first mention of Willcox in the *Transactions of the New Zealand Institute* is in 1910 by Cockayne, who wrote: "I must express my great obligations to various members of this Institute and others who have been so good as to collect specimens for me, and especially to Mr W. Willcox, of the Tourist Department, who is most assiduously collecting the alpine plants in the Otago lakes district, with the object of making a garden of New Zealand mountain plants in the Queenstown Park. Such a work is of national importance, and the collection will be not only a special attraction to visitors, but one of the greatest scientific value" (11). Cockayne's paper was on "Some Hitherto-unrecorded Plant Habitats" and included 10 records from Willcox, mainly from the Hector Mountains, (south of Queenstown) and the Lake Harris Saddle, some being extensions of range. Additional Willcox records published by Cockayne in *TNZI*, are from Ben Lomond and rocks near the Queenstown Cemetery (1911); Cecil Peak (opposite Queenstown) (1912); and *Nothofagus* forest near Queenstown (1914).

Willcox also corresponded with Donald Petrie and T.F. Cheeseman, both of Auckland. In 1913 Petrie described *Olearia willcoxii* from Queenstown Hill, Lake County, and wrote: "this species, which I am pleased to name after its discoverer, was collected by Mr William Willcox, Director of the Queenstown Park. — Dr L. Cockayne, F.R.S., F.L.S. of Christchurch, kindly lent me the material for this description" (*TNZI* 45). In the same paper Petrie described *Veronica willcoxii* from the "Routeburn Valley, near Lake Harris, 3000 ft W. Willcox! and D.P.". Hamlin (12) notes that Petrie was at the Routeburn and Lake Harris in late February and early March, 1911. In 1917, Petrie recorded *Veronica rakaiensis* collected by Willcox near the Arrowtown - Macetown Road (*TNZI* 49). From 1914 to 1916 Willcox wrote 5 letters to Cheeseman (13) who described *Cotula willcoxii* in 1916 from "Head of Lake Wakatipu, Otago, near Mount Earnslaw" and wrote: "The only specimens that I have seen are those collected by Mr Willcox of Queenstown, and I have much pleasure in associating his name with the plant" (*TNZI* 48).

Willcox joined the Wakatipu Bowling Club (later Queenstown Bowling Club), and was appointed an Honorary Member at the AGM in 1909. He won many tournaments through the years and was a Committee Member from 1915-1917. Every Annual Report stated "fine bowling surface prepared by W. Willcox" (8). (This bowling-green crops up again in 1932 when Cockayne, Simpson & Thomson (14) used it as an example of invasion by indigenous species: *Hydrocotyle americana* and *Plantago triandra* via the watering system, and a species of *Acaena*).

On 6 November, 1917, Willcox resigned from the Bowling Club "due to having to leave the District" and was congratulated "on his advancement." (8). On the same day the "Lake Wakatipu Mail" announced: "Mr W. Willcox who for the past 11 years has occupied the position of Superintendent of the Tourist Department's Domain, better known as The Park, has received advice of his transfer to Te Aroha, where he will have charge of the Government Hot Springs Domain, 66 acres in extent. During his term of service here Mr Willcox has made a little paradise of the Domain, and in every branch of his work has proved his genius as a landscape gardener. His successor is Mr J. Dalton of Te Aroha".

Willcox's first day of duty as Head Gardener, Te Aroha, was on 10 January, 1918 (15). His next promotion was to Head Gardener, Rotorua, probably in mid 1921 (16), and he retired to Papatoetoe on 30 June, 1927, at the age of 65 years 9 months (17,18).

In Auckland, on 24 November, 1944, at the age of 83, and after living in New Zealand for 64 years, William Willcox died at a private hospital in Gillies Avenue (1). He was then living at Huapai, and he was cremated at Waikumete. In Queenstown in 1981, Neill Simpson of DoC was taken by an elderly lady to look at the remnants of an alpine rock garden in an area of the gardens known as the Park Street Reserve and then covered in tall Douglas firs. He had some of these firs removed, to open up the area and replant with

native species. An old lancewood, a southern rata, a few other trees, and the rocks themselves, were all that remained.

#### Acknowledgements

For help with this note I am particularly grateful to Lindsay Stewart, historian of the Queenstown Bowling Club, who also visited the Lake County Museum at Arrowtown to check the "Lake Wakatipu Mail" for me. Geoffrey Baylis (Dunedin) suggested that I consult Dr Stewart, and I was also helped by Neill Simpson (Queenstown), Ewen Cameron and Hilda Godley (Auckland), Ruth Mossman (Rotorua), and Nigel Ingram (Ashburton).

#### References

(1) Death Certificate; (2) List of persons employed in the Public Service, 31 March, 1919 *Suppl. N.Z. Gazette* 3 July, 1919; (3,4) Stones Canterbury, Marlborough, Nelson and Westland Directory, 1905 and 1906; (5) Death Certificate; (6) Cockaye *TNZI* 44, 1912; (7) Appendix to the Journal of the House of Representatives, 1906; (8) Records, or Minutes, Queenstown Bowling Club; (9) Stones Otago and Southland Directory 1907 (10) Records, Canterbury Public Library; (11) *TNZI* 42, 1910; (12) *Rec. Dom. Mus.* 1958; (13) J.E. Bellingham *Ms 58* Auckland Institute and Museum, 1992; (14) *J. Linn. Soc. London - Botany* 49; (15) *N.Z. Gazette* 1918; (16) not gazetted, but Willcox's successor was appointed in mid-1921; (17) *N.Z. Gazette* 1927; (18) *The N.Z. Herald* 27 Nov. 1944.

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## PUBLICATIONS

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### ■ The Student's Flora of Tasmania completed

A recent event of interest was the launching at the Tasmanian Museum and Art Gallery of Part 4B, the final volume of "The Student's Flora of Tasmania". Joint authors are Winifred M. Curtis and Dennis L. Morris. Publication is by St David's Park Publishing, GPO Box 3076, Hobart, Tasmania, Australia 7001. The book represents the culmination of the dedicated studies of Dr Curtis during a period of over 50 years.

Part 4B includes descriptions of all the native and naturalized monocotyledons in Tasmania with the exception of the orchids which were described earlier in Part 4A. The names of naturalized species are indicated by an asterisk. The arrangement of the families follows the system of classification developed by J.A. Cronquist, as has been adopted in the "Flora of Australia" project. There are useful keys to the families, to the genera within each family and to the species within each genus. Line drawings indicate distinguishing features of selected species and a glossary provides definitions of the descriptive botanical terms used in the book. For each species the botanical name is given as well as any synonyms and the common name where one exists. Distribution within Tasmania and, where applicable, in other countries is noted.

The book is of particular interest in New Zealand botanist as Tasmania and New Zealand have a number of families, genera and species in common. Some revisions are made, for example *Baumea huttonii* (Kirk) S.T. Blake is placed in synonymy under *B. arthrophylla* (Nees) Boeckeler. The authority for some names is altered as in *Baumea rubiginosa* (G. Forst) Boeckeler. In other cases, species such as the sedges *Lepidosperma filiforme* and *L. laterale* are confirmed as being present in New Zealand as well as in Tasmania.

Although it could be expected that Dr Curtis would now relax and enjoy the many tributes to her outstanding contribution to the botany of Tasmania, I am assured that already she has started on updating the first three volumes. The classification adopted in these was that of Bentham and Hooker as used by Bentham in *Flora Australiensis* (1863-78). In the revision the system developed by Cronquist will be adopted throughout. It is fortunate that she will be ably assisted by her colleague Dennis Morris. We look forward to the new publication entitled "Flora of Tasmania".

Ella Campbell, Massey University, Private Bag 11222, Palmerston North

## ■ Journals received

### New Zealand Native Orchid Group Journal 53

(March 1995; ISSN 1170-4543). Edited by Ian St George. 36pp.

Contents include: Editorials on *Cyrtostylis*, *Caladenia* and *Thelymitra longifolia* insect pollination; Notes on 4 orchid species and 6 orchid locations; Orchid artists (Helen Kirkland Dalrymple and Dorothy Jenkin); Close relations (*Corybas pictus*); Historical reprints (Cheeseman on *Cyrtostylis* fertilisation and Colenso on *Dendrobium* at Turakirae Point); New species (*Drymoanthus flavus* St George et Molloy); and a report on the Iwitahi Conference.

### Newsletter of the Hawaiian Botanical Society 33 (4)

(December 1994) Edited by Gregory A. Koob. 16pp.

Contents include: A Hawaiian Bog in the Koolau Mountains of Oahu; Witches broom disease of mamane (*Sophora chrysophylla*); Notes for the Hawaiian Botanical Society; Annual report of the membership.

## Editors

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## DESIDERATA

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### ■ Request for *Wahlenbergia* from Lord Howe Island, and *W. cartilaginea* from Marlborough

I request specimens with ripe seed, or living plants, or both, of *Wahlenbergia insula-howei*.

I believe *W. insula-howei* is closely related to, if not identical with, the species I call *W. "vernicaosa"*. My starved seedling plants which I am growing in poor hard conditions to induce them to a xerophytic form, exactly match Lothian's description of *W. limnophylyx* (Lothian 1947, p 233-234) which has been rightly incorporated by Peter Smith (1992) into *W. insula-howei*. The capsules in my *W. "vernicaosa"* are obconic with spreading patent lobes, not globular with erect lobes as described (by Lothian and Smith) for *W. insula-howei*. In normal garden conditions *W. "vernicaosa"* grows huge and dense, each plant a mound 50cm across and 30cm tall, smothered in flowers and capsules, with glossy varnished leaves. I give each large plant a pellet of sheep manure (Garden Galore) to keep them happy. When starved the seedlings look poor and spindly with one flower per stalk, like the illustration of *W. insula-howei* in Smith (1992) fig. 12 (h).

I am trying to induce such starvation and drought as to make some of the seedlings look like *W. gracilentia* of Australia. Next move is to try crowding them in a pot of pure sand. I doubt if we really have *W. gracilentia* in northern New Zealand, unless as an adventive. The chromosome count is different from *W. "vernicaosa"*.

I would welcome visitors to see my *Wahlenbergia* garden. I have 18 taxa growing, of the 12 species native to New Zealand. They are flowering now and will probably remain in flower until Easter.

The only one I don't yet have is *W. cartilaginea*. But I have made a scree garden ready for it, and would love to have some fresh seed from Mt Terako or Tapuaenuku or Tardale or Lake Tennyson, or any other place where it grows.

If anyone wants rooted living seedling plants of *W. "vernicaosa"* from Three Kings, Surville Cliffs, or Mokohinau Islands, I will be happy to supply them.

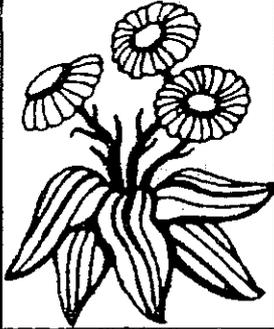
**Judith Petterson**, 24 Eruini St, Waikanae

### ■ Request for *Syzygium maire* fruit

If you live near forest containing swamp maire (*Syzygium maire*) please try and collect some fresh fruit to enable study of the seed for the New Zealand seed atlas. Send samples to Colin Webb at the address given below.

**Colin Webb**, Manaaki Whenua - Landcare Research, PO Box 69, Lincoln

## FORTHCOMING MEETINGS/CONFERENCES



### **SOUTHERN ALPINES '96 INTERNATIONAL ALPINE GARDEN CONFERENCE 5-10 JANUARY 1996**

**HOSTED BY THE NEW ZEALAND ALPINE GARDEN SOCIETY INC.**

In January 1996 alpine garden enthusiasts from all over the world will meet at the Canterbury Horticultural Centre in Christchurch New Zealand to celebrate, experience and learn about the alpine flora of the Southern Hemisphere including the New Zealand, Australian, South American and South African botanical regions.

Presentations by authorities from around the world on alpine gardening and flora will be complemented by displays of living plants. The conference will include two field trips to see extraordinary and breathtaking alpine flora of the Southern Alps. Pre-and Post-Conference tours have been arranged for alpine plant enthusiasts, these have already attracted overwhelming interest.

**For more information, a Conference Programme and Registration Form, contact:**

**The Secretary  
Southern Alpines '96  
1/37 Augusta Street  
Redcliffs  
CHRISTCHURCH  
Fax/Phone: 03-384 2170**

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## New Zealand Botanical Society

### THREATENED AND LOCAL PLANT LISTS (1995 Revision)

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E.K. Cameron<sup>1</sup>, P.J. de Lange<sup>2</sup>, D.R. Given<sup>3</sup>, P.N. Johnson<sup>4</sup>, C.C. Ogle<sup>5</sup>

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#### ABSTRACT

A revision of the 1993 New Zealand Threatened and Local plant lists is presented. A total of 319 vascular plant taxa are considered at risk within the New Zealand botanical region using existing IUCN Red Data Book categories of threat. Threatened taxa are distributed as follows; Presumed Extinct 9 taxa, Critical 20 taxa, Endangered 37 taxa, Vulnerable 62 taxa, Rare 79 taxa, Insufficiently Known 28 taxa, Taxonomically Indeterminate 84 taxa. Within the New Zealand category of Local, 142 taxa are listed. Fifty taxa listed by Cameron *et al.* (1993) as under some level of threat have been deleted from this list.

#### INTRODUCTION

Cameron *et al.* (1993) provided the first substantial revision of the New Zealand Threatened Plant lists since the listing of such taxa was first initiated by the Native Plant Protection Society (Given 1981). This revision is a continuation of that process by the New Zealand Threatened Plants Committee.

#### The Revision Process

A call for submissions on candidate taxa and threat categories was made by Cameron *et al.* (1993). By the deadline date of 31 January 1994 a total of 72 submissions dealing with 183 taxa was received by P.J. de Lange, the Threatened Plant Committee Convenor. Prior to the meeting most submissions were summarised and circulated to the committee for comment. Revision occurs by the majority decision of the committee. The quality of submissions was variable and considerable time was needed to clarify points raised in some of the submissions.

As with the previous revision it was agreed that all submissions received become the joint property of the New Zealand Botanical Society and the submitting author(s). Submissions are held on file by the committee convenor. We would ask that those seeking to use information contained within these submissions, obtain either the permission of the New Zealand Botanical Society Committee or the submission author(s).

#### Criteria for Selection

The lists are for vascular plant taxa (species, subspecies, varieties) believed to be indigenous to the New Zealand Botanical Region, see Cameron *et al.* (1993). Included are plants which are indigenous also to overseas countries, where they may or may not be considered threatened, e.g. *Caleana minor*, *Lepturus repens* and *Peperomia leptostachya*.

The present revision comprises three distinct lists. The list of Threatened Plants concentrates on taxa which are at risk nationally, using the IUCN Red Data Book categories outlined below. The second list of Local Plants (not an IUCN category) contains taxa sufficiently restricted in distribution to warrant monitoring. The third list covers those taxa previously listed as either Threatened or Local, which based on present evidence have been deleted from the above lists.

#### Threat Categories

The threat categories are those used by the Species Survival Commission of the International Union for Conservation of Nature (IUCN). These categories are:

Presumed Extinct

Vulnerable

Taxonomically Indeterminate

Endangered

Rare

Insufficiently Known

Two additional categories are used here. These are the newly proposed IUCN category **Critical** (Mace *et al.*, 1993) which is defined in that document, and the non-IUCN category **Local** - which is defined by Cameron *et al.* (1993). Our use of Critical is in partial acceptance of the proposed revision of IUCN Threat Categories by Mace *et al.* (1993). We see merit in the recognition of such a category which indicates a high probability of extinction of the candidate taxa. Our use, we hope, will act as a clear guideline enabling conservation bodies to direct their resources more effectively. We see little value in accepting the proposed category of susceptible (which would replace rare, see Mace *et al.*, 1993) until such time as the ambiguity of its definition and application has been clarified.

#### Nomenclature

The treatment adopted for taxa follows that outlined by Cameron *et al.* (1993). As with the previous revision the lists contain a large number (85) of undescribed taxa. This is because many of these are under some level of threat and their conservation should not be precluded by lack of formal name (Cameron *et al.*, 1993). Undescribed taxa are admitted to the main list, as opposed to the Taxonomically Indeterminate list, if in the opinion of the committee they are "good entities".

#### Nomenclature changes affecting taxa listed by Cameron *et al.* (1993)

Cameron *et al.* (1993):

This Revision:

*Deschampsia caespitosa*  
*Hebe* "George"  
*Hebe raoulii* var. *maccaskillii*  
*Melicytus* "flexuose"  
*Myoporum debile*  
*Pterostylis plumosa*

*Deschampsia caespitosa* var. *macrantha* (Cheeseman 1906)  
*Heliohebe acuta* (Garnock-Jones 1993)  
*Heliohebe raoulii* var. *maccaskillii* (Garnock-Jones 1993)  
*Melicytus flexuosus* (Molloy and Druce 1992)  
*Eremophila debilis* (Chinnock 1992)  
*Pterostylis tasmanica* (Jones 1994)

The taxon known as "X it" previously considered in the Elatinaceae (Cameron *et al.* 1993) is now placed within the Cunoniaceae (P.J. Garnock-Jones, G.M. Timmerman & S.J. Wagstaff pers. comm., 1994).

#### Newly described taxa

*Drymoanthus flavus* (Molloy & St George 1994)  
*Picris angustifolia* subsp. *merxmulleri* (Holzapfel & Lack 1993)  
*Picris burbridgei* (Holzapfel & Lack 1993)

#### Comparison with Previous List

This revision recognises 319 threatened taxa using available IUCN Red Data Book Threat Categories. A further 142 taxa are ranked as Local, providing a combined total of 461 taxa under some level of threat within the New Zealand Botanical Region. Fifty taxa previously considered threatened or Local are deleted. Fifty-one taxa are listed for the first time in the Threatened Plant List (30 of these undescribed) while 30 are new listings for the Local Plant List (6 of these undescribed).

These changes represent an increase of 23 taxa on the figures reported by Cameron *et al.* (1993). Based on current estimates of our flora (Druce 1993) 19% of the New Zealand flora is now under some level of threat. When each of the threat categories is considered in relation to 1993 figures it is encouraging to see an overall decrease in the numbers of taxa within the higher categories of threat. The major increase in the size of the threatened plant list has been within those taxa which are taxonomically indeterminate. The committee would like to stress the point that funds to research these taxa, especially their taxonomic status, are urgently needed. Under present funding, taxonomy, like many of these undescribed taxa, is under threat. With the present global conservation emphasis based on the need to protect indigenous biodiversity, it is ironic that taxonomy, the keystone to recognising diversity, remains under-funded.

Finally, the committee would like to urge list users to become familiar with those taxa presently ranked as Insufficiently Known or Taxonomically Indeterminate. Without their assistance the status of these taxa will remain in doubt. With this in mind, the committee is preparing an annotated list for those taxonomically indeterminate and unnamed taxa to assist with further field studies. It is our intention to publish this in the *New Zealand Botanical Society Newsletter* later in 1995.

#### Using the Lists

As with the 1993 revision, the New Zealand Threatened Plants Committee has adopted the same system of annotating additions and changes of rank with the appropriate footnote. These should help users understand the rationale behind our decisions. We also have continued the use of a single \* to indicate

indigenous taxa known to be conspecific with overseas populations and under no threat outside the New Zealand Botanical Region, e.g. *Plectranthus parviflorus*. Taxa annotated with \*\* are those indigenous taxa threatened both within and outside New Zealand, and/or not recently demonstrated as conspecific with overseas populations, e.g. *Lycopodium serpentinum*\*\* in the first instance and *Sebaea ovata*\*\* in the second.

#### Call for Submissions

It is intended that this list will become effective for three years from the date of publication. Submissions for the 1998 revision of the list are now sought. These should be sent to your closest threatened plant committee representative no later than 31 January 1998.

#### Acknowledgements

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## NEW ZEALAND THREATENED PLANT LIST (1995)

### Key

- \* Indigenous taxon found naturally overseas and not considered threatened within the overseas part of its range. New Zealand populations have been confirmed as conspecific with overseas counterpart (33 taxa).
- \*\* Indigenous taxon known or thought to be threatened outside the New Zealand Botanical Region, or taxon presently treated as indigenous with additional overseas distribution but which may, on revision, prove endemic to the New Zealand Botanical Region (12 taxa).
- (!) Addition to list (51 spp.)

### PRESUMED EXTINCT (9)

Taxa which are no longer known to exist in the wild or in cultivation after *repeated* searches of the type localities and other known or likely places.

<i>Chiloglottis formicifera</i> *	Orchidaceae <sup>1,2</sup>
<i>Lepidium obtusatum</i> s.str.	Brassicaceae <sup>1</sup>
<i>Lepidium obtusatum</i> subsp. "Manukau"	Brassicaceae <sup>1</sup>
<i>Logania depressa</i>	Loganiaceae <sup>1</sup>
<i>Muellerina celastroides</i> * (!)	Loranthaceae <sup>1</sup>
<i>Myosotis laingii</i>	Boraginaceae <sup>1</sup>
<i>Pterostylis nutans</i> *	Orchidaceae <sup>1,2</sup>
<i>Stellaria elatinooides</i>	Caryophyllaceae <sup>1</sup>
<i>Trilepidea adamsii</i>	Loranthaceae <sup>1</sup>

### CRITICAL (20)

Taxa which face an *extremely high probability of extinction* in the wild within the immediate future (see Mace *et al.*, 1993, for a detailed definition).

<i>Acaena rorida</i>	Rosaceae <sup>3,6</sup>
<i>Amphibromus fluitans</i> *	Poaceae <sup>3,5,6</sup>
<i>Asplenium pauperequitum</i>	Aspleniaceae <sup>2,3,6</sup>
<i>Australopyrum calcis</i> subsp. <i>calcis</i>	Poaceae <sup>3,6</sup>
<i>Caleana minor</i> **	Orchidaceae <sup>2</sup>
<i>Carmichaelia kirkii</i> s.lat.	Fabaceae
<i>Cortaderia turbaria</i>	Poaceae <sup>3</sup>
<i>Corybas carsei</i>	Orchidaceae <sup>2,3</sup>
<i>Hebe breviracemosa</i>	Scrophulariaceae <sup>3</sup>
<i>Lepidium banksii</i>	Brassicaceae <sup>2,3,6</sup>
<i>Lepidium sisymbrioides</i> subsp. <i>matau</i>	Brassicaceae <sup>2</sup>
<i>Lepturus repens</i> * (!)	Poaceae <sup>3</sup>
<i>Pennantia baylisiana</i>	Ucacinaceae <sup>2</sup>
<i>Peperomia leptostachya</i> *	Piperaceae <sup>6</sup>
<i>Pterostylis nana</i> **	Orchidaceae <sup>4</sup>
<i>Ranunculus recens</i> "Moawhango"	Ranunculaceae <sup>3</sup>
<i>Sebaea ovata</i> **	Gentianaceae <sup>2</sup>
<i>Tecomanthe speciosa</i>	Bignoniaceae <sup>2</sup>
<i>Thelymitra matthewsii</i> **	Orchidaceae <sup>2</sup>
"X it"	Cunoniaceae <sup>4</sup>

### ENDANGERED (37)

Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. Included are taxa whose numbers have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction.

<i>Anogramma leptophylla</i> *	Pteridaceae <sup>2,3</sup>
<i>Atriplex billardierei</i> agg. **	Chenopodiaceae
<i>Atriplex cinerea</i> *	Chenopodiaceae

*Boehmeria australis* var. *dealbata*  
*Cardamine* "tarn"  
*Carex inopinata*  
*Chordospartium muritai*  
*Christella dentata* "N.Z."  
*Clianthus puniceus*  
*Crassula hunua*  
*Dactylanthus taylorii*  
*Gunnera hamiltonii*  
*Hebe armstrongii*  
*Hebe cupressoides*  
*Helichrysum dimorphum*  
*Ischnocarpus novae-zelandiae*  
*Kunzea sinclairii*  
*Lepidium flexicaule* \*\*  
*Lepidium kirkii*  
*Lepidium oleraceum* s.lat.  
*Leptinella nana*  
*Metrosideros bartlettii*  
*Muehlenbeckia astonii*  
*Olearia hectorii*  
*Olearia pachyphylla*  
*Olearia polita*  
*Pittosporum patulum* (!)  
*Pittosporum* "Surville"  
*Plantago spathulata* subsp. *picta*  
*Plectranthus parviflorus* \*  
*Polystichum* "Chathams"  
*Pseudognaphalium* "compactum"  
*Pterostylis micromega*  
*Ranunculus recens* "Manaia"  
*Rorippa divaricata*  
*Scutellaria novae-zelandiae*  
*Simplicia laxa*

Urticaceae  
 Brassicaceae<sup>3,6</sup>  
 Cyperaceae  
 Fabaceae  
 Thelypteridaceae  
 Fabaceae  
 Crassulaceae<sup>2,3,6</sup>  
 Balanophoraceae<sup>2,3,6</sup>  
 Gunneraceae  
 Scrophulariaceae<sup>2,3</sup>  
 Scrophulariaceae  
 Asteraceae  
 Brassicaceae<sup>3,6</sup>  
 Myrtaceae<sup>2,3,6</sup>  
 Brassicaceae<sup>2,3,6</sup>  
 Brassicaceae  
 Brassicaceae<sup>3,6</sup>  
 Asteraceae  
 Myrtaceae  
 Polygonaceae  
 Asteraceae  
 Asteraceae<sup>3,6</sup>  
 Asteraceae  
 Pittosporaceae<sup>2,3,6</sup>  
 Pittosporaceae<sup>2,3,6</sup>  
 Plantaginaceae  
 Lamiaceae<sup>5</sup>  
 Dryopteridaceae<sup>3,6</sup>  
 Asteraceae<sup>2,3</sup>  
 Orchidaceae<sup>11</sup>  
 Ranunculaceae<sup>3</sup>  
 Brassicaceae<sup>2,3,6</sup>  
 Lamiaceae<sup>3</sup>  
 Poaceae

#### VULNERABLE (62)

Taxa believed likely to move into the Endangered category in the near future if the causal factors continue operating. Included are taxa of which most or all the populations are decreasing because of over-exploitation, extensive destruction of habitat or other environmental disturbance; taxa with populations that have been seriously depleted and whose ultimate security is not yet assured; and taxa with populations that are still abundant but are under threat from serious adverse factors throughout their range.

*Aciphylla dieffenbachii*  
*Aciphylla traversii*  
*Alepis flavida*  
*Astelia chathamica*  
*Australopyrum calcis* subsp. *optatum*  
*Baumea complanata*  
*Botrychium* aff. *lunaria* \*\*  
*Calystegia marginata* \*  
*Carmichaelia curta*  
*Carmichaelia williamsii*  
*Celmisia macmahonii* var. *macmahonii*  
*Chenopodium detestans*  
*Chordospartium stevensonii*  
*Coprosma* "violacea" (!)  
*Coprosma waima*  
*Coprosma wallii* (!)  
*Crassula peduncularis* \*  
*Deschampsia caespitosa* var. *macrantha*

Apiaceae  
 Apiaceae  
 Loranthaceae  
 Asteliaceae<sup>6,7,8</sup>  
 Poaceae  
 Cyperaceae  
 Ophioglossaceae<sup>2,3</sup>  
 Convolvulaceae  
 Fabaceae<sup>3,6</sup>  
 Fabaceae<sup>2,3</sup>  
 Asteraceae<sup>6</sup>  
 Chenopodiaceae<sup>2,3</sup>  
 Fabaceae  
 Rubiaceae<sup>2,3</sup>  
 Rubiaceae  
 Rubiaceae<sup>3</sup>  
 Crassulaceae  
 Poaceae

*Eleocharis neozelandica*  
*Embergeria grandifolia*  
*Hebe acutiflora*  
*Hebe barkerii*  
*Hebe "bishopiana"*  
*Hebe speciosa*  
*Hibiscus diversifolius* \*  
*Hydatella inconspicua*  
*Iphigenia novae-zelandiae*  
*Isolepis basilaris*  
*Lepidium sisymbrioides* subsp. *kawarau*  
*Lepidium tenuicaule*  
*Leptinella featherstonii*  
*Luzula celata* (!)  
*Lycopodium serpentinum* \*\*  
*Marattia salicina* \*  
*Mazus novaezeelandiae*  
*Melicytus "Egmont"*  
*Melicytus flexuosus*  
*Myosotis colensoi*  
*Myosotis laeta*  
*Myosotis "lytteltonensis"*  
*Myosotis "pottsiana"*  
*Olearia fragrantissima*  
*Olearia "Waima"*  
*Ophioglossum petiolatum* \*  
*Pachystegia rufa*  
*Peraxilla colensoi*  
*Peraxilla tetrapetala*  
*Pittosporum dallii*  
*Pomaderris apetala* \*  
*Pomaderris polifolia* \*  
*Prasophyllum aff. patens*  
*Ranunculus recens* s.str.  
*Ranunculus ternatifolius*  
*Rhopalostylis "Chatham"*  
*Senecio scaberulus*  
*Sicyos australis* \*\*  
*Teucrium parvifolium*  
*Todea barbara* \*  
*Triglochin palustris* \*  
*Urtica linearifolia*  
*Wilsonia backhousei* (!) \*  
 "Z ombi"

Cyperaceae  
 Asteraceae  
 Scrophulariaceae  
 Scrophulariaceae  
 Scrophulariaceae<sup>2,4,6</sup>  
 Scrophulariaceae  
 Malvaceae  
 Hydatellaceae  
 Colchicaceae<sup>2,3</sup>  
 Cyperaceae<sup>3</sup>  
 Brassicaceae  
 Brassicaceae<sup>2,3</sup>  
 Asteraceae  
 Juncaceae<sup>3</sup>  
 Lycopodiaceae  
 Marattiaceae<sup>3</sup>  
 Scrophulariaceae  
 Violaceae<sup>4</sup>  
 Violaceae<sup>4</sup>  
 Boraginaceae<sup>3</sup>  
 Boraginaceae<sup>3</sup>  
 Boraginaceae  
 Boraginaceae  
 Asteraceae<sup>3</sup>  
 Asteraceae  
 Ophioglossaceae  
 Asteraceae<sup>3</sup>  
 Loranthaceae  
 Loranthaceae  
 Pittosporaceae  
 Rhamnaceae  
 Rhamnaceae  
 Orchidaceae  
 Ranunculaceae<sup>3</sup>  
 Ranunculaceae<sup>3,6</sup>  
 Arecaceae  
 Asteraceae  
 Cucurbitaceae<sup>3</sup>  
 Verbenaceae<sup>2,3,6</sup>  
 Osmundaceae  
 Juricaginaceae  
 Urticaceae<sup>3</sup>  
 Convolvulaceae<sup>5</sup>  
 Asteraceae

RARE (79)

Taxa with small populations which are not Endangered or Vulnerable *but are at risk*. These taxa are usually localized within restricted geographical areas or habitats or are thinly scattered over a more extensive range. Rare plants are often endemics with a narrow distribution whereas Vulnerable and Endangered plants have often been formerly more widespread.

*Adiantum formosum* \*  
*Austrofestuca littoralis* \*  
*Brachyglottis arborescens*  
*Brachyglottis huntii*  
*Brachyscome linearis*  
*Calochilus paludosus* \*  
*Carex uncifolia* (!)  
*Celmisia adamsii* var. *rugulosa*  
*Cheesemania "stellata"* (!)  
*Chiloglottis valida* \*

Adiantaceae<sup>2</sup>  
 Poaceae  
 Asteraceae  
 Asteraceae<sup>6,7,8</sup>  
 Asteraceae  
 Orchidaceae  
 Cyperaceae<sup>3,6</sup>  
 Asteraceae<sup>6</sup>  
 Brassicaceae<sup>4</sup>  
 Orchidaceae<sup>2,6,7</sup>

<i>Chionocholea spiralis</i>	Poaceae <sup>6,7</sup>
<i>Chionohebe glabra</i>	Scrophulariaceae <sup>4</sup>
<i>Coprosma neglecta</i> subsp. "Maunganui Bluff"	Rubiaceae <sup>3</sup>
<i>Coprosma obconica</i> subsp. <i>obconica</i>	Rubiaceae
<i>Corokia macrocarpa</i>	Escalloniaceae
<i>Crassula ruamahanga</i>	Crassulaceae
<i>Cyathea kermadecensis</i>	Cyatheaceae <sup>6,7,8</sup>
<i>Cyclosorus interruptus</i> *	Thelypteridaceae
<i>Davallia</i> "Puketi"	Davalliaceae <sup>4,6</sup>
<i>Doodia aspera</i> *	Blechnaceae <sup>6,7,8</sup>
<i>Euphorbia glauca</i>	Euphorbiaceae <sup>6,7,8</sup>
<i>Gnaphalium nitidulum</i> **	Asteraceae
<i>Grammitis rawlingsii</i>	Grammitidaceae
<i>Gratiola nana</i> *	Scrophulariaceae
<i>Hebe adamsii</i>	Scrophulariaceae
<i>Hebe</i> "Takahe"	Scrophulariaceae <sup>2,4,6</sup>
<i>Hebe</i> "Wairoa"	Scrophulariaceae <sup>3,4</sup>
<i>Heliohebe acuta</i>	Scrophulariaceae
<i>Iti lacustris</i>	Brassicaceae
<i>Lepidium</i> "Open Bay Islands"	Brassicaceae <sup>2,4,6</sup>
<i>Lepidium sisymbrioides</i> subsp. <i>sisymbrioides</i> (!)	Brassicaceae <sup>2,3,6</sup>
<i>Leptinella albida</i>	Asteraceae
<i>Leptinella pyrethrifolia</i> var. <i>linearifolia</i>	Asteraceae
<i>Leptinella rotundata</i>	Asteraceae
<i>Luzula crenulata</i>	Juncaceae
<i>Mazus</i> "False Islet" (!)	Scrophulariaceae <sup>4,6</sup>
<i>Melicytus</i> "Matiri" (!)	Violaceae <sup>3,4,6</sup>
<i>Myosotidium hortensia</i>	Boraginaceae
<i>Myosotis albosericea</i>	Boraginaceae <sup>6,8</sup>
<i>Myosotis brockiei</i> (!)	Boraginaceae <sup>3,6</sup>
<i>Myosotis</i> "glauca"	Boraginaceae <sup>3,6</sup>
<i>Myosotis matthewsii</i>	Boraginaceae
<i>Myosotis oreophila</i>	Boraginaceae <sup>6,8</sup>
<i>Myosurus minimus</i> subsp. <i>novae-zelandiae</i>	Ranunculaceae
<i>Myriophyllum robustum</i>	Haloragaceae
<i>Myrsine</i> "Burnett"	Myrsinaceae <sup>3</sup>
<i>Neopaxia</i> "Arthur" (!)	Portulacaceae <sup>3,4,6</sup>
<i>Notospartium torulosum</i>	Fabaceae
<i>Olearia capillaris</i>	Asteraceae <sup>2,6</sup>
<i>Olearia chathamica</i>	Asteraceae
<i>Olearia traversii</i>	Asteraceae
<i>Olearia</i> "Pomahaka" (!)	Asteraceae <sup>3</sup>
<i>Ourisia modesta</i>	Scrophulariaceae
<i>Phylloglossum drummondii</i> *	Lycopodiaceae
<i>Pimelea arenaria</i> "South"	Thymelaeaceae
<i>Pimelea tomentosa</i> s.str.	Thymelaeaceae <sup>6,8</sup>
<i>Pittosporum obcordatum</i>	Pittosporaceae <sup>6,7,8</sup>
<i>Pittosporum pimeleoides</i> subsp. <i>pimeleoides</i>	Pittosporaceae
<i>Pittosporum turneri</i>	Pittosporaceae
<i>Plagianthus regius</i> var. <i>chathamicus</i>	Malvaceae
<i>Plantago obconica</i>	Plantaginaceae
<i>Poa aucklandica</i> subsp. <i>rakiura</i>	Poaceae
<i>Poa senex</i>	Poaceae
<i>Poa sudicola</i>	Poaceae
<i>Pomaderris hamiltonii</i>	Rhamnaceae
<i>Poranthera microphylla</i> *	Euphorbiaceae
<i>Pterostylis tasmanica</i> *	Orchidaceae <sup>4</sup>
<i>Puccinellia</i> "Central Otago"	Poaceae <sup>4,6,8</sup>
<i>Ranunculus godleyanus</i>	Ranunculaceae
<i>Ranunculus haastii</i> subsp. <i>piliferus</i>	Ranunculaceae <sup>3</sup>
<i>Ranunculus viridis</i>	Ranunculaceae
<i>Senecio dunedinensis</i>	Asteraceae <sup>3</sup>

<i>Senecio kermadecensis</i> (!)	Asteraceae <sup>3</sup>
<i>Senecio marotiri</i>	Asteraceae
<i>Swainsona novae-zelandiae</i>	Fabaceae <sup>6</sup>
<i>Thelymitra tholiformis</i>	Orchidaceae
<i>Thelypteris confluens</i> *	Thelypteridaceae
<i>Tupeia antarctica</i>	Loranthaceae
<i>Utricularia australis</i> *	Lentibulariaceae

#### INSUFFICIENTLY KNOWN (28)

Taxa that are *suspected* but *not definitely known* to belong to any of the above categories because of lack of information. An "Insufficiently Known" taxon does not have to be *proved* to be in any of the four categories - Critical, Endangered, Vulnerable or Rare. It is hoped that listing a taxon as "Insufficiently Known" will stimulate studies to find out its true category of threat.

<i>Aciphylla leighii</i>	Apiaceae
<i>Calochilus herbaceus</i> *	Orchidaceae
<i>Carex chathamica</i>	Cyperaceae
<i>Carex "tenuiculmis"</i> (!)	Cyperaceae <sup>3</sup>
<i>Carex ventosa</i>	Cyperaceae
<i>Chionohebe myosotoides</i>	Scrophulariaceae
<i>Coriaria pottsiana</i>	Coriariaceae
<i>Crassula colorata</i> var. <i>acuminata</i> *	Crassulaceae <sup>5</sup>
<i>Deschampsia pusilla</i>	Poaceae
<i>Hebe imbricata</i>	Scrophulariaceae
<i>Juncus holoschoenus</i>	Juncaceae <sup>8</sup>
<i>Korthalsella salicornioides</i> (!)	Viscaceae <sup>3</sup>
<i>Leptinella filiformis</i>	Asteraceae
<i>Libertia peregrinans</i> agg.	Iridaceae
<i>Limosella curdieana</i> *	Scrophulariaceae
<i>Myosotis cheesemanii</i>	Boraginaceae
<i>Myosotis glabrescens</i>	Boraginaceae
<i>Myosotis petiolata</i> s.str.	Boraginaceae
<i>Oreomyrrhis "delicatula"</i> (!)	Apiaceae
<i>Peperomia "purple vein"</i>	Piperaceae
<i>Picris angustifolia</i> subsp. <i>merxmulleri</i> (!) *	Asteraceae
<i>Picris attenuata</i> (!)	Asteraceae
<i>Polygonum plebeium</i> (!) *	Polygonaceae <sup>5</sup>
<i>Rytidosperma tenue</i>	Poaceae
<i>Thelymitra "Ahipara"</i>	Orchidaceae
<i>Trisetum "serpentine"</i> (!)	Poaceae
<i>Uncinia purpurata</i>	Cyperaceae
<i>Uncinia strictissima</i> (!)	Cyperaceae

#### TAXONOMICALLY INDETERMINATE (84)

This includes: (1) Taxa about which there is doubt regarding taxonomic status and which require further investigation; and (2) genetic variants which are distinct at a level which may not warrant formal taxonomic recognition. Entries are grouped by probable category of threat.

#### Presumed Extinct (4)

<i>Carmichaelia floribunda</i> (!)	Fabaceae <sup>1</sup>
<i>Deyeuxia "Flaxbourne"</i>	Poaceae <sup>1,5</sup>
<i>Myosotis traversii</i> var. <i>cinerascens</i>	Boraginaceae <sup>1</sup>
<i>Pseudognaphalium "Zoo"</i> (!)	Asteraceae <sup>1</sup>

#### Extinct in wild (2)

<i>Carmichaelia prona</i>	Fabaceae
<i>Hebe pimeleoides</i> var. <i>glauco-caerulea</i> (!)	Scrophulariaceae

### Critical (5)

<i>Carmichaelia arenaria</i>	Fabaceae <sup>3,4</sup>
<i>Carmichaelia fieldii</i>	Fabaceae <sup>3,4</sup>
<i>Celmisia</i> "Mangaweka"	Asteraceae
<i>Cheesemania</i> "Chalk Range"	Brassicaceae <sup>3,4</sup>
<i>Pimelea</i> "Turakina"	Thymelaeaceae <sup>3</sup>

### Endangered (15)

<i>Brachyscome</i> "Pareora"	Asteraceae
<i>Colobanthus</i> "Pareora"	Caryophyllaceae
<i>Craspedia</i> "Chatham"	Asteraceae <sup>3</sup>
<i>Craspedia</i> "Kaitorete"	Asteraceae
<i>Craspedia</i> "tarn" (!)	Asteraceae
<i>Gentiana</i> "Pareora"	Gentianaceae
<i>Gentiana</i> "Waitaki"	Gentianaceae <sup>3</sup>
<i>Geranium</i> "Pareora"	Geraniaceae
<i>Geranium</i> "Tengawai"	Geraniaceae
<i>Leptinella</i> "Clutha"	Asteraceae
<i>Leptinella intermedia</i>	Asteraceae
<i>Leptinella</i> "Pareora"	Asteraceae
<i>Leptinella</i> "Tengawai"	Asteraceae
<i>Limosella</i> "Opunake"	Scrophulariaceae
<i>Linum monogynum</i> var. <i>chathamicum</i>	Linaceae

### Vulnerable (13)

<i>Brachyscome</i> "Ward"	Asteraceae
<i>Gentiana</i> "Brown"	Gentianaceae
<i>Gentiana</i> "scree" (!)	Gentianaceae
<i>Gentiana</i> "Ward"	Gentianaceae
" <i>Gingidia patula</i> "	Apiaceae
<i>Hebe</i> "Awaroa"	Scrophulariaceae
<i>Hebe</i> "Bald Knob Ridge"	Scrophulariaceae
<i>Hibiscus trionum</i> "NZ" **	Malvaceae
<i>Hypsela</i> "Burgoo" (!)	Lobeliaceae <sup>8</sup>
<i>Leptinella dioica</i> subsp. <i>monoica</i>	Asteraceae <sup>8</sup>
<i>Myosotis</i> "Flora" (!)	Boraginaceae
<i>Myosotis</i> "Volcanic Plateau"	Boraginaceae
<i>Ranunculus</i> "Waihao"	Ranunculaceae

### Rare (17)

<i>Brachyglottis saxifragoides</i>	Asteraceae
<i>Carex kirkii</i> var. <i>elatior</i>	Cyperaceae
<i>Carmichaelia hollowayii</i>	Fabaceae
<i>Carmichaelia nigrans</i>	Fabaceae
<i>Deyeuxia</i> "Waima"	Poaceae
<i>Euphrasia</i> "White" (!)	Scrophulariaceae
<i>Geranium</i> "Red Hills"	Geraniaceae <sup>6</sup>
<i>Hebe dilatata</i> (!)	Scrophulariaceae
<i>Hydrocotyle</i> "Ototoa"	Apiaceae <sup>6</sup>
<i>Limosella</i> "Manutahi"	Scrophulariaceae
<i>Melicytus</i> "Burnett"	Violaceae
<i>Ourisia</i> "Clark" (!)	Scrophulariaceae
<i>Ourisia</i> "Richmond" (!)	Scrophulariaceae
<i>Parahebe</i> "hairy" (!)	Scrophulariaceae
<i>Pratia</i> "Woodhill"	Lobeliaceae
<i>Ranunculus</i> "Hope" (!)	Ranunculaceae
<i>Wahlenbergia simpsonii</i>	Campanulaceae

## Insufficiently Known (28)

<i>Brachyglottis southlandica</i> var. <i>albidula</i>	Asteraceae
<i>Brachyscome</i> "West Dome" (!)	Asteraceae
<i>Cardamine</i> "Rata Peak"	Brassicaceae
<i>Cardamine</i> "Reporoa Bog slender var."	Brassicaceae
<i>Carex allanii</i>	Cyperaceae
<i>Carmichaelia juncea</i> (!)	Fabaceae
<i>Celmisia cordatifolia</i> var. <i>similis</i> (!)	Asteraceae
<i>Chenopodium pusillum</i>	Chenopodiaceae
<i>Craspedia</i> "Fyfe" (!)	Asteraceae
<i>Craspedia</i> "Gouland Downs" (!)	Asteraceae
<i>Craspedia</i> "Hackett" (!)	Asteraceae
<i>Craspedia</i> "Henderson" (!)	Asteraceae
<i>Craspedia</i> "Loveridge" (!)	Asteraceae
<i>Craspedia</i> "Pikikiruna" (!)	Asteraceae
<i>Dracophyllum</i> "glaucous" (!)	Epacridaceae
<i>Dracophyllum viride</i>	Epacridaceae
<i>Euphrasia</i> "Zetland" (!)	Scrophulariaceae <sup>3</sup>
<i>Hebe annulata</i>	Scrophulariaceae
<i>Hebe matthewsii</i>	Scrophulariaceae
<i>Muehlenbeckia debilis</i>	Polygonaceae
<i>Myosotis</i> "Mosburn" (!)	Boraginaceae
<i>Myosotis</i> "Tapuaenuku" (!)	Boraginaceae
<i>Pimelea aridula</i> agg.	Thymelaeaceae
<i>Pimelea</i> "Three Kings" agg.	Thymelaeaceae
<i>Pterostylis</i> aff. <i>graminea</i> (!)	Orchidaceae
<i>Pygmaea armstrongii</i>	Scrophulariaceae
<i>Spiranthes</i> "Motutangi"	Orchidaceae
<i>Utricularia</i> "Chatham" (!)	Lentibulariaceae

### Explanation of Footnotes

- <sup>1</sup>Repeated systematic surveys have failed to locate taxon in the wild. Taxon is not known in cultivation from New Zealand sources.
- <sup>2</sup>Species constrained by either reproductive behaviour or ecological requirements.
- <sup>3</sup>Apparently less common or more threatened than previously believed.
- <sup>4</sup>Systematic name change either recently published or revision in process.
- <sup>5</sup>Possibly adventive.
- <sup>6</sup>Ecology and distribution better understood.
- <sup>7</sup>Previous threat(s) lessened by management.
- <sup>8</sup>More abundant on known sites than previously believed.

## NEW ZEALAND BOTANICAL SOCIETY LOCAL PLANT LIST (1995)

### Key

- \* Taxon found naturally overseas and not considered uncommon within that range. New Zealand taxon has been demonstrated as conspecific with overseas counterpart (11 taxa).
- \*\* Indigenous taxon known or thought to be uncommon outside the New Zealand Botanical Region, or taxon presently treated as indigenous but which may, on revision, prove endemic to the New Zealand Botanical Region (2 taxa).
- (!) Addition to list (30 spp.)

### LOCAL PLANT LIST (142)

*This is not an IUCN Threat Category.* This is designed to act as a 'watchlist' for taxa which are sufficiently restricted to warrant noting and some monitoring. It may include taxa which occupy habitats potentially threatened in the future, and those found in sensitive habitats which are prone to damage.

<i>Acaena pallida</i> *	Rosaceae
<i>Aciphylla</i> "flaccida"	Apiaceae
<i>Aciphylla montana</i> var. <i>gracilis</i>	Apiaceae
<i>Aciphylla stannensis</i>	Apiaceae
<i>Aciphylla trifoliolata</i>	Apiaceae <sup>7</sup>
<i>Anemanthele lessoniana</i> (!)	Poaceae <sup>7</sup>
<i>Anisotome acutifolia</i>	Apiaceae <sup>9</sup>
<i>Brachyglottis bifistulosa</i>	Asteraceae
<i>Brachyglottis compacta</i>	Asteraceae <sup>1,3</sup>
<i>Brachyglottis pentacopa</i>	Asteraceae <sup>1,3</sup>
<i>Brachyglottis perdicioides</i>	Asteraceae
<i>Brachyglottis sciadophila</i>	Asteraceae
<i>Brachyglottis traversii</i>	Asteraceae
<i>Brachyglottis turneri</i>	Asteraceae
<i>Brachyscome humilis</i>	Asteraceae <sup>1,3</sup>
<i>Bulbinella talbotii</i>	Asphodelaceae
<i>Caladenia</i> aff. <i>iridescens</i> (!)	Orchidaceae <sup>1</sup>
<i>Calochilus robertsonii</i> *	Orchidaceae
<i>Carex edgariae</i>	Cyperaceae
<i>Carex traversii</i>	Cyperaceae
<i>Carmichaelia appressa</i>	Fabaceae
<i>Carmichaelia astonii</i>	Fabaceae
<i>Carmichaelia compacta</i>	Fabaceae <sup>1,3</sup>
<i>Cassinia leptophylla</i> var. <i>amoena</i>	Asteraceae
<i>Celmisia cordatifolia</i> var. <i>cordatifolia</i> (!)	Asteraceae <sup>1,7</sup>
<i>Celmisia haastii</i> var. <i>tomentosa</i>	Asteraceae
<i>Celmisia hookeri</i>	Asteraceae
<i>Celmisia inaccessa</i>	Asteraceae
<i>Celmisia insignis</i> (!)	Asteraceae
<i>Celmisia mackaui</i>	Asteraceae
<i>Celmisia macmahonii</i> var. <i>hadfieldii</i>	Asteraceae
<i>Celmisia morganii</i>	Asteraceae <sup>3</sup>
<i>Celmisia philocremna</i>	Asteraceae <sup>6,8</sup>
<i>Celmisia rutlandii</i> (!)	Asteraceae <sup>7</sup>
<i>Celmisia spedenii</i>	Asteraceae <sup>6,8</sup>
<i>Celmisia thomsonii</i>	Asteraceae <sup>1,3</sup>
<i>Centipeda minima</i> * (!)	Asteraceae <sup>1</sup>
<i>Centrolepis minima</i>	Centrolepidaceae
<i>Ceratocephalus pungens</i>	Ranunculaceae
<i>Cheesemania wallii</i>	Brassicaceae
<i>Clematis marmoraria</i> (!)	Ranunculaceae <sup>1,3</sup>
<i>Colensoa physaloides</i>	Lobeliaceae
<i>Coprosma intertexta</i> (!)	Rubiaceae <sup>7</sup>
<i>Coprosma neglecta</i> s.str. (!)	Rubiaceae <sup>1,3</sup>
<i>Coprosma obconica</i> subsp. "Survillie"	Rubiaceae
<i>Coprosma spathulata</i> subsp. "Survillie"	Rubiaceae
<i>Coprosma talbrockiei</i>	Rubiaceae
<i>Cordyline kaspar</i>	Asphodelaceae <sup>3,5</sup>
<i>Coriaria</i> "Rimutaka" (!)	Coriariaceae <sup>1</sup>
<i>Crassula manaia</i>	Crassulaceae
<i>Crassula multicaulis</i>	Crassulaceae
<i>Cryptostylis subulata</i> *	Orchidaceae <sup>1,3</sup>
<i>Dicranopteris linearis</i> *	Gleicheniaceae
<i>Drymoanthus flavus</i> (!)	Orchidaceae <sup>7</sup>
<i>Elingamita johnsonii</i> (!)	Myrsinaceae <sup>5</sup>
<i>Epilobium gunnianum</i> *	Onagraceae
<i>Epilobium margaretae</i> (!)	Onagraceae <sup>7</sup>
<i>Epilobium purpuratum</i> (!)	Onagraceae <sup>1,3</sup>
<i>Ewartia sinclairii</i> (!)	Asteraceae <sup>1,7</sup>
<i>Fimbristylis squarrosa</i> *	Cyperaceae <sup>6</sup>
<i>Fuchsia procumbens</i>	Onagraceae
<i>Geniostoma rupestre</i> var. <i>crassum</i>	Loganiaceae

<i>Gentiana antipoda</i>	Gentianaceae <sup>5</sup>
<i>Gentiana gibbsii</i>	Gentianaceae
<i>Gentiana lilliputiana</i>	Gentianaceae
<i>Geranium traversii</i>	Geraniaceae
<i>Geum divergens</i>	Rosaceae
<i>Geum pusillum</i>	Rosaceae <sup>1,3</sup>
<i>Gunnera densiflora</i> (!)	Gunneraceae <sup>7</sup>
<i>Haloragis erecta</i> subsp. <i>cartilaginea</i>	Haloragaceae
<i>Hebe</i> "Bartlett"	Scrophulariaceae
<i>Hebe</i> "brevifolia"	Scrophulariaceae
<i>Hebe dieffenbachii</i>	Scrophulariaceae <sup>2,3</sup>
<i>Hebe elliptica</i> var. <i>crassifolia</i>	Scrophulariaceae
<i>Hebe gibbsii</i>	Scrophulariaceae
<i>Hebe ligustrifolia</i> var. "Surville"	Scrophulariaceae
<i>Hebe</i> "marble" (!)	Scrophulariaceae <sup>4,7</sup>
<i>Hebe</i> "Mokohinau"	Scrophulariaceae <sup>5</sup>
<i>Hebe murrellii</i>	Scrophulariaceae
<i>Hebe pareora</i>	Scrophulariaceae
<i>Hebe ramosissima</i>	Scrophulariaceae
<i>Helichrysum aggregatum</i> var. "Surville"	Asteraceae
<i>Helichrysum intermedium</i> var. "tumidum"	Asteraceae
<i>Helichrysum plumeum</i>	Asteraceae
<i>Heliohebe raoulii</i> var. <i>maccaskillii</i>	Scrophulariaceae <sup>4</sup>
<i>Hypolepis amaurorachis</i> *	Dennstaedtiaceae
<i>Ileostylis micranthus</i> **	Loranthaceae
<i>Kirkianella</i> "Cook Strait" (!)	Asteraceae <sup>7</sup>
<i>Leptinella calcarea</i>	Asteraceae
<i>Leucogenes</i> "Peel"	Asteraceae <sup>4</sup>
<i>Leucopogon parviflorus</i> s.lat. **	Epacridaceae
<i>Macropiper melchior</i>	Piperaceae <sup>5</sup>
<i>Meryta sinclairii</i>	Araliaceae <sup>5</sup>
<i>Muehlenbeckia ephedroides</i> (!)	Polygonaceae <sup>1</sup>
<i>Myosotis angustata</i> (!)	Boraginaceae <sup>7</sup>
<i>Myosotis arnoldii</i>	Boraginaceae
<i>Myosotis concinna</i> (!)	Boraginaceae <sup>1,3</sup>
<i>Myosotis monroi</i> (!)	Boraginaceae <sup>7</sup>
<i>Myosotis</i> "pansa"	Boraginaceae
<i>Myrsine coxii</i>	Myrsinaceae
<i>Myrsine oliverii</i>	Myrsinaceae <sup>5</sup>
<i>Notothlaspi</i> "Red Hills"	Brassicaceae <sup>2</sup>
<i>Notospartium carmichaeliae</i>	Fabaceae
<i>Olearia allomii</i>	Asteraceae <sup>5</sup>
<i>Oreomyrrhis</i> "minutiflora" (!)	Apiaceae <sup>7</sup>
<i>Ourisia goulandiana</i>	Scrophulariaceae
<i>Ourisia spathulata</i>	Scrophulariaceae
<i>Parsonsia</i> "Surville"	Apocynaceae
<i>Peperomia tetraphylla</i> * (!)	Piperaceae <sup>7</sup>
<i>Phyllocladus</i> "serpentine"	Podocarpaceae
<i>Picris burbridgei</i> * (!)	Asteraceae <sup>4</sup>
<i>Pimelea arenaria</i> "North" (!)	Thymelaeaceae <sup>1,3</sup>
<i>Pittosporum fairchildii</i>	Pittosporaceae <sup>5</sup>
<i>Pittosporum pimeleoides</i> subsp. <i>major</i>	Pittosporaceae
<i>Pittosporum virgatum</i>	Pittosporaceae
<i>Pleurosorus rutifolius</i> *	Aspleniaceae
<i>Poa pygmaea</i>	Poaceae
<i>Pomaderris paniculosa</i> subsp. <i>novae-zelandiae</i>	Rhamnaceae
<i>Pseudopanax ferox</i>	Araliaceae
<i>Pterostylis</i> "linearis"	Orchidaceae
<i>Puccinellia antipoda</i> (!)	Poaceae <sup>5</sup>
<i>Ranunculus brevis</i>	Ranunculaceae
<i>Ranunculus grahamii</i>	Ranunculaceae
<i>Ranunculus maculatus</i>	Ranunculaceae

<i>Ranunculus recens</i> var. <i>lacustris</i>	Ranunculaceae
<i>Ranunculus scirithalis</i>	Ranunculaceae
<i>Ranunculus stylosus</i>	Ranunculaceae
<i>Raoulia cinerea</i>	Asteraceae
<i>Rytidosperma petrosum</i>	Poaceae <sup>1,2</sup>
<i>Senecio</i> "Cuvier"	Asteraceae <sup>1,2,3,4,5</sup>
<i>Senecio hauwai</i>	Asteraceae
<i>Senecio lautus</i> var. <i>esperensis</i> (!)	Asteraceae <sup>5</sup>
<i>Senecio</i> "Pokohinu" (!)	Asteraceae <sup>1,2,3,4,5</sup>
<i>Simplicia buchananii</i>	Poaceae
<i>Stellaria decipiens</i> var. <i>angustata</i> (!)	Caryophyllaceae <sup>5</sup>
<i>Stilbocarpa lyallii</i>	Araliaceae <sup>9</sup>
<i>Stilbocarpa robusta</i>	Araliaceae <sup>9</sup>
<i>Stipa petriei</i>	Poaceae <sup>6,8</sup>
<i>Streblus banksii</i> (!)	Moraceae <sup>7</sup>
<i>Tetrachondra hamiltonii</i>	Tetrachondraceae
<i>Thelymitra malvina</i>	Orchidaceae <sup>1,3</sup>
<i>Thismia rodwayi</i> *	Thismiaceae

#### Explanation of Footnotes

<sup>1</sup>Ecology and distribution better understood.

<sup>2</sup>Previous threat(s) lessened by management.

<sup>3</sup>More abundant on known sites than previously believed.

<sup>4</sup>Systematic name change either recently published or revision in process.

<sup>5</sup>Island endemic under no immediate threat or less threatened than previously believed.

<sup>6</sup>Possibly adventive.

<sup>7</sup>Apparently less common or more threatened than previously believed.

#### **SPECIES NO LONGER CONSIDERED THREATENED OR LOCAL (50 taxa)**

Taxa formerly considered under some level of threat in Cameron *et al.* (1993) but which are here rejected from this revision of the New Zealand Botanical Society Threatened Plant and Local Plant Lists, because they are more widespread or abundant than previously thought.

##### **Formerly Ranked as Presumed Extinct (1)**

<i>Eremophila debilis</i> *	Myoporaceae <sup>5,7</sup>
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##### **Formerly Ranked as Endangered (1)**

<i>Wahlenbergia stricta</i> subsp. <i>stricta</i> *	Campanulaceae <sup>1,7</sup>
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##### **Formerly Ranked as Rare (2)**

<i>Alectryon excelsus</i> var. <i>grandis</i>	Sapindaceae <sup>1,2,3</sup>
<i>Ranunculus macropus</i>	Ranunculaceae <sup>1,2,3</sup>

##### **Formerly Ranked as Insufficiently Known or Taxonomically Indeterminate (11)**

<i>Colobanthus</i> "Tengawai"	Caryophyllaceae <sup>3,4</sup>
<i>Coprosma neglecta</i> "Three Kings"	Rubiaceae <sup>8</sup>
<i>Dracophyllum</i> "Puketi"	Epacridaceae <sup>4</sup>
<i>Gentiana</i> "Charleston"	Gentianaceae <sup>4</sup>
<i>Lagenifera stipitata</i> *	Asteraceae <sup>1,3</sup>
<i>Microlaena thomsonii</i>	Poaceae <sup>1,3</sup>
<i>Notospartium glabrescens</i>	Fabaceae <sup>1,3</sup>
<i>Olearia angulata</i>	Asteraceae <sup>2,3</sup>
<i>Phormium</i> "Chatham"	Phormiaceae <sup>1,2,3,8</sup>
<i>Phormium</i> "Surville"	Phormiaceae <sup>4</sup>
<i>Wahlenbergia brockiei</i>	Campanulaceae <sup>1,3,4</sup>

## Formerly Ranked as Local (35)

<i>Carex elingamita</i>	Cyperaceae <sup>8</sup>
<i>Chionochloa lanea</i>	Poaceae <sup>1,3</sup>
<i>Christella</i> "thermal"	Thelypteridaceae <sup>1,3</sup>
<i>Coprosma acutifolia</i>	Rubiaceae <sup>2,8</sup>
<i>Corybas cryptanthus</i>	Orchidaceae <sup>1,3</sup>
<i>Corybas rotundifolius</i>	Orchidaceae <sup>1,3</sup>
<i>Coprosma propinqua</i> var. <i>martinii</i>	Rubiaceae <sup>1,2,3,8</sup>
<i>Davallia tasmanii</i>	Davalliaceae <sup>8</sup>
<i>Desmoschoenus spiralis</i>	Cyperaceae <sup>1,2,3</sup>
<i>Hebe</i> "angustissima"	Scrophulariaceae <sup>1,3</sup>
<i>Hebe biggarii</i>	Scrophulariaceae <sup>1,3</sup>
<i>Hebe insularis</i>	Scrophulariaceae <sup>1,8</sup>
<i>Hebe townsonii</i>	Scrophulariaceae <sup>1,3</sup>
<i>Homalanthus polyandrus</i>	Euphorbiaceae <sup>2,8</sup>
<i>Ipomoea pes-caprae</i> subsp. <i>brasiliensis</i> *	Convolvulaceae <sup>1,3</sup>
<i>Leptinella dispersa</i> subsp. <i>rupestris</i>	Asteraceae <sup>1,3</sup>
<i>Macrothelypteris torresiana</i> *	Thelypteridaceae <sup>1,3</sup>
<i>Mitrasacme montana</i> var. <i>helmsii</i>	Spigeliaceae <sup>1,3</sup>
<i>Myrsine</i> "Poor Knights"	Myrsinaceae <sup>8</sup>
<i>Myosotis saxosa</i>	Boraginaceae <sup>1,3</sup>
<i>Nephrolepis</i> cf. <i>cordifolia</i> **	Davalliaceae <sup>1,3</sup>
<i>Olearia coriacea</i>	Asteraceae <sup>1,3</sup>
<i>Pimelea crosby-smithiana</i>	Thymelaeaceae <sup>1,3</sup>
<i>Pimelea suteri</i>	Thymelaeaceae <sup>1,3</sup>
<i>Pisonia brunoniana</i> *	Nyctaginaceae <sup>1,3</sup>
<i>Pseudopanax gilliesii</i>	Araliaceae <sup>1,3</sup>
<i>Pseudopanax kermadecensis</i>	Araliaceae <sup>1,2,3,8</sup>
<i>Schizeilema cockaynei</i>	Apiaceae <sup>1,3</sup>
<i>Solanum aviculare</i> var. <i>latifolia</i>	Solanaceae <sup>1,2,4</sup>
<i>Sprengelia incarnata</i> *	Epacridaceae <sup>1,3</sup>
<i>Stellaria</i> "Poor Knights"	Caryophyllaceae <sup>1,2,3</sup>
<i>Thelymitra</i> "rough leaf"	Orchidaceae <sup>1,3</sup>
<i>Utricularia delicatula</i>	Lentibulariaceae <sup>1,2,3</sup>
<i>Xeronema callistemon</i>	?Phormiaceae <sup>3,8</sup>
<i>Yuania australis</i>	Orchidaceae <sup>1,3</sup>

## Explanation of Footnotes

<sup>1</sup>Ecology and distribution better understood.

<sup>2</sup>Previous threat(s) lessened by management.

<sup>3</sup>More abundant on known sites than previously believed.

<sup>4</sup>Taxonomically indistinct.

<sup>5</sup>Systematic name change either recently published or revision in process.

<sup>6</sup>Taxonomic status uncertain.

<sup>7</sup>Adventive.

<sup>8</sup>Island endemic under no immediate threat or less threatened than previously believed.

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