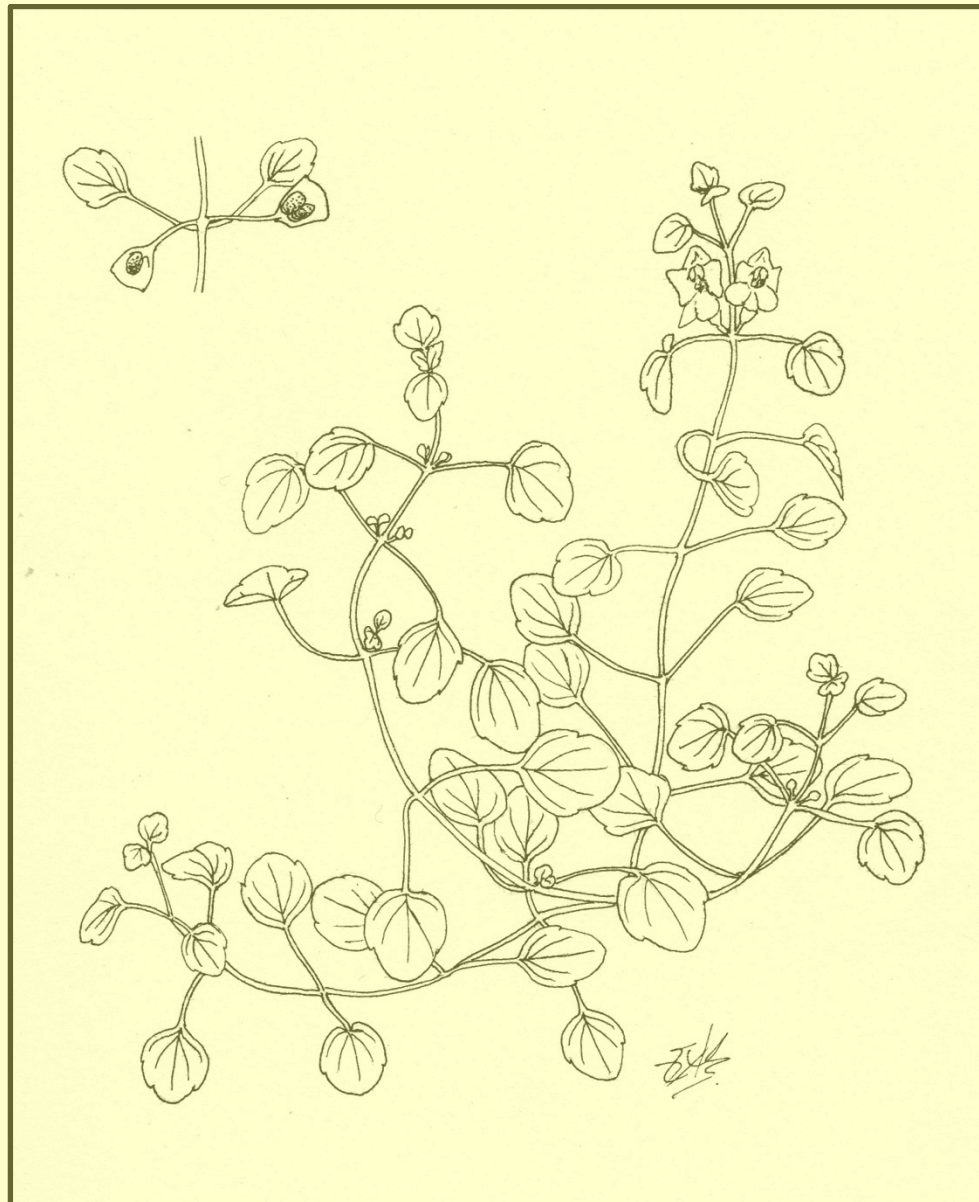


NEW ZEALAND BOTANICAL SOCIETY

# NEWSLETTER

NUMBER 128

June 2017



## New Zealand Botanical Society

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### Subscriptions

The 2017 ordinary and institutional subscriptions are \$25 (reduced to \$18 if paid by the due date on the subscription invoice). The 2017 student subscription, available to full-time students, is \$12 (reduced to \$9 if paid by the due date on the subscription invoice).

Back issues of the *Newsletter* are available at \$7.00 each. 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 each year for that calendar year. Existing subscribers are sent an invoice with the December *Newsletter* for the next years 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 September 2017 issue is 25 August 2017.

Please post contributions to:  
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Send email contributions to [editor@nzbotanicalsociety.org.nz](mailto:editor@nzbotanicalsociety.org.nz). Files are preferably in MS Word, as an open text document (Open Office document with suffix ".odt") or saved as RTF or ASCII. Macintosh files can also be accepted. Graphics can be sent as TIF JPG, or BMP files; please do not embed images into documents. Alternatively photos or line drawings can be posted and will be returned if required. Drawings and photos make an article more readable so please include them if possible.

### Cover Illustration

*Scutellaria novae-zelandiae* by Eleanor Burton.

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### Regional Botanical Society News

#### ■ Auckland Botanical Society

##### AGM & March Meeting

The AGM saw Ewen Cameron re-elected as President. The talk by our Lucy Cranwell Grant recipient, Waikato student Stevie Noe, was preceded by a humorous introduction by his Donald Trump-look-alike supervisor, who demanded that ABS pay for, out of our vast funds, a wall to protect Waikato Bot Soc from predation from the north. Stevie is studying the nectar yield in manuka to understand the resource that is available from plants for honey production, and the challenges of preserving local manuka ecotypes.

##### March Field Trip

Awhitu botanical guru, Tricia Aspin, led this trip on the peninsula, first to coastal pohutukawa forest on private property, then to Matakawau Reserve, where typical Awhitu forest included kauri.

##### Pokaka Camp

Taylor Memorial Lodge was the base for a five day camp aiming to explore the botany of the Tongariro Ecological District. Mike Wilcox and Nick Singers are working on an illustrated catalogue of the vascular plants of the area, and it was hoped that contributions would be made to help with the completion of this project. Various sites were explored and familiarisation with old and new plant friends made for an interesting time.

##### April Meeting

Holly Cox, Senior Regional Advisor for pest plants at Auckland Council, brought us up-to-date with the latest news on biological control agents being introduced to help deal with Auckland's vast array of weed species. Although in the long run these agents can save large amounts of money in control costs, the initial costs stretch a meagre budget to its limits.

##### April Field Trip

On the trip to Clark Bush and Exhibition Drive, Titirangi, the attendees were divided into two groups. One group helped Geoff Davidson complete a vegetation survey of the area which Watercare has shortlisted as a possible site for a water treatment plant. The second group continued along the track past some large kauri trees.

##### May Meeting

Instead of the usual Plant of the Month talk, Oscar Grant outlined his involvement in this year's University of Canterbury Field Botany Course at Cass, which he was able to attend with the help of an ABS travel grant. Oscar's enthusiasm for both the alpine flora and the excitement generated by the course was gratifying for a society that is devoted to assisting young people with a love of botany. James Brock, PhD student from University of Auckland, outlined his studies into the ecology of the tree ferns, *Cyathea dealbata* and *C. medullaris*, as pioneers of succession and how they influence the regeneration of canopy tree species. The enthusiastic question session at the end was an indication of the interest engendered by this talk.

##### May Field Trip

Twenty-six people attended the walk on the newly purchased 37 ha block, mainly of bush, which has been named Matuku Link. Accessed from Bethells Road, it links Matuku Reserve, Ark in the Park and Habitat te Henga. After a welcome coffee and an introductory talk held in the well-ventilated barn, which will eventually be converted into an education centre, we crossed the river flats. These will soon have the ground prepared for planting and the drains plugged to become an extension of the Te Henga wetland. The well-tracked bush surrounding the flats has mostly been cleared in the past, with some kauri-clad ridges and other areas that will take a bit longer to regenerate when pests are eradicated.

##### Forthcoming Activities

7 June Peter de Lange, "Kapiti Island" + mid-winter book auction

17 June	Okura Bush
5 July	Margaret Stanley
15 July	Bryophyte and lichen workshop, Unitec
2 August	Catherine Kirby, "Epiphytes and tree canopy research"
19 August	Central Auckland urban trees

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## ■ Rotorua Botanical Society

### April Field Trip - Pakihi Track, Opotiki

We headed to the Motu Road end of the Pakahi Track. It was a very easy downhill grade on a wide, old pack track. At the start there were numerous large *Alseuosmia pusilla* in abundant fruit to 2 m tall. Above, the forest consisted of kamahi, quintinia, tawari and red and hard beech with the odd toatoa and *Dracophyllum latifolium*. The area was very rich in ferns so we made very slow progress. Initially we concentrated on filmy ferns with *Hymenophyllum revolutum*, *H. multifidum* and *H. dilatatum* in abundance. Filmy ferns of special interest included brownish, softly hairy *H. frankliniae*, the flat-fronded *H. bivalve* and the cryptic *Trichomanes elongatum*. Other noteworthy ferns were *Blechnum colensoi*, *B. vulcanicum* and the much-debated *Blechnum membranaceum*, which is always difficult to separate from small *B. chambersii*.

Further on, as we descended, tawa and hinau appeared in the canopy and willow-leaved maire and white maire growing together challenged us. We were too late to see many orchids but *Earina autumnalis* scented the air and leaves and occasional seed head of *Corybas acuminatus*, *C. oblongus* and *Pterostylis banksii* could be identified. The odd wet opening had many herbs including *Ranunculus reflexus*, *Epilobium rotundifolium*, *Plantago lanceolata*, *Agrostis capillaris*, *Urtica sykesii* and wall lettuce.

After lunch we were soon on a warmer, sunny face where *Astelia solandri* and *A. trinervis* formed a dense ground cover and on the steep slopes below the track kiekie, supplejack and small nikau were common. New ferns included *Sticherus cunninghamii* and *Blechnum discolor*. In the clearings now *Libertia grandiflora*, *Gahnia setifolia* and *Aceana anserinifolia* appeared.

### May Field Trip - Motuoapa wetland and Peninsula - Lake Taupo

The area is a very large wetland with open water banded by numerous old beaches, loosely connected to an old island. Water levels were high so we chose to follow a track down the Waimarino Stream to the lakeshore and then along a trapline to the headland (island). The track to the shore was initially fringed by revegetation plantings. It was very weedy with garden discards and plants such as Japanese honeysuckle, *Chamaesyce maculata*, *Scrophularia auriculata*, spurrey, yarrow, white clover, coxfoot, and browntop. But soon the track was fringed by bracken, blackberry, five-finger, mahoe and tall fescue over which scrambled *Calystegia sepium* and the odd *Parsonsia capsularis* or *Muehlenbeckia australis*. In the wetter areas *Carex lessonii* was prominent along with *Ludwigia palustris*, *Juncus articulatus*, *J. bufonius*, *Lycopus europeus* and *Elatine gratioloides*. Once on the shore and on the trapline crack willow, blackberry and mahoe predominated with the odd patch of tall kanuka and grassy clearings. Highlights here were unexpected patches of *Apodasmia similis*, *Pellaea rotundifolia* and the dreaded *Dryopteris filix-mas*.

After lunch we scrambled up the short cliff onto the base of the peninsula into tall kanua forest. On the bank *Blechnum vulcanicum*, *Hymenophyllum rarum* and *H. flabellifolium* were common along with *Earina autumnalis*, mingimingi and prickly mingimingi. At last we were in some real forest with scattered large emergent black beech and rewarewa. It was mostly pretty simple with a privet understorey, swathes of *Hymenophyllum scabrum* on the ground, scattered occurrences of kamahi, rimu saplings, black maire, *Carmichaelia australis*, mamaku, silver fern, and smaller ferns such as kidney fern, *Blechnum discolor*, *Hymenophyllum sanguinolentum* and *H. dilatatum*. A highlight here was scattered patches of *Acianthus sinclairii* in flower.

The return was initially along the trapline on the inside of the beach/spit through swathes of *Carex lessonii* with frequent wet feet. Plants such as raupo and *Eleocharis spacellata* were especially prominent but smaller plants included *Lobelia angulata*, *Ranunculus flammula* and *Azolla filicoides*.

#### FUTURE EVENTS

June 11 Maungaongaonga Scenic Reserve, near Waiotapu  
July 2 Waiotahi Scenic Reserve, Waiotahi Valley, Opotiki  
August 6 TECT Park Forest Remnants, Te Matai  
September 9 *Myosotis pottsiana* sites – Galatea Foothills, Urewera

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#### ■ Wellington Botanical Society

##### Summer Camp – North-west Nelson 11-18 January

Twenty-six BotSocers attended the summer field trip based at The Outpost, Mangarakau. We visited several very different plant habitats including Mangarakau Swamp, coastal salt turf, Patarau River, Wharariki Beach, and picturesque Lake Otuhie. The summit of 500-m Knuckle Hill, with its spectacular views to Farewell Spit in the north, and Whanganui Inlet to the west, was clothed in stunted vegetation not seen nearer sea level.

Three enthusiastic botanists from DOC, namely Shannel Courtney, and the father-and-son team of Simon Walls and Rowan Hindmarsh-Walls joined one of our day trips, and gave illustrated evening talks about their work. They were thrilled to find the very rare *Myosotis* aff. *brockiei* growing on the limestone cliffs above The Outpost. With botanists like them working for DOC, the future of our native flora is in good hands.

##### Mangarakau Swamp

Mangarakau Swamp Reserve comprises land purchased from private landowners in 2001 by the NZ Native Forests Restoration Trust, and land owned by DOC. Mangarakau Swamp is the first wetland, and first South Island reserve, created by the trust. It is managed by The Friends of Mangarakau Swamp and, covenanted with the QE11 Trust, with the aim of restoration. It lies south of Whanganui Inlet, near the west coast of the northern South Island.

We were joined for the day by DOC Rangers, Simon Walls and his son Rowan. They described the history of the swamp, explained something of the geology of the area, and helped us with plant identification. Only a remnant of the forest that once covered the wetland now remains along the western edge. This is being extended by restoration planting using local seed grown off site, sourced from the wetland. Within the swamp area there are three dominant vegetation patterns. The *Gleichenia*/mānuka scrublands are on the drier soils, while the wetter areas are covered in rush and reed communities of *Typha* (raupo) and *Baumea*. Within these areas there are some small lakes where the endangered *Myriophyllum robustum* continues to survive. The reed-lands also have some rare plants, including the pink ladies' tresses orchid, *Spiranthes sinensis*.

##### Knuckle Hill, 506 m

Most of us reached the top of Knuckle Hill to enjoy outstanding views that included Farewell Spit, Mt Burnett, pākihi swamps and Whanganui Inlet. We were impressed by the completely different vegetation association on the nutrient-deprived granite of the summit. Botanical highlights included: *Ascarina lucida*, *Gleichenia dicarpa*, *Lycopodium volubile*, *Metrosideros parkinsonii*, *M. umbellata*, *Sticherus cunninghamii*, *Thelymitra cyanea*, three species of *Dracophyllum*, *Weinmannia racemosa*, and the new species of *Kunzea* that looks like *Leucopogon fasciculatus*.

##### Salt Turf

On the sand-hill banks behind the beach south of the mouth of Sandhills Creek a few people searched among the sparse common plants, and admired a native plantain. At the cluster of

limestone monoliths, bluffs, tongues and small reefs, our searching intensified among the hollows, grooves and cracks supporting mostly gnarled taupata, flax, pōhuehue, two spleenworts (*Asplenium obtusatum* and *A. oblongifolium*), *Dysphyma australe* and a small *Veronica* (*Hebe*). One large tongue of limestone, with a gently sloping ledge top, ended in a dangerous overhang that became the main focus of our attention. Here was an amazing variety of many species of tiny coastal plants. Some of the special gems were the endemic and uncommon species *Wahlenbergia congesta*, *Leptinella calcarea* and *Ranunculus recens* var. *recens*, the declining *Myosotis pygmaea* var. *pygmaea* and the threatened *Lepidium flexicaule*. Catching the eye too were several *Thelymitra* spp. with leathery leaf and capsule, only 2–3 cm tall and the red fruits of a *Nertera*. It seemed inappropriate that we should tread on this beautiful carpet, but considering how few others might ever venture there, the sturdy little plants might be OK.

#### DOC reserve behind The Outpost

This sortie to the limestone bluff and cave above The Outpost was intended to be a leisurely day! On the bluffs were *Myosotis* aff. *brockiei* (a) (CHR 497375; Lake Otuhie). (This was a new population of the plant, so the find was exciting). Other plants of note were *Veronica stenophylla* var. *hesperia*, *Asplenium lepidotum*, and *Brachyglottis hectorii*, which was in flower.

#### Lake Otuhie

We began botanising at Sandhills Creek bridge. Along the base of limestone bluffs we almost immediately saw the newly described *Asplenium lepidotum* with its distinctive black scales. The bluffs had eroded in such a way as to leave striated terraces on which grew *Poa anceps*, *Coprosma robusta* and *Hebe stenophylla* var. *stenophylla*, *Olearia avicennifolia*, *Coriaria arborea* var. *arborea*. The wetland paddocks were filled with *Galium propinquum*, *Juncus edgariae*, *Rumex acetosella* and *Carex eragrostis*. Across the valley along the base of the limestone bluffs on the north side we encountered *Coprosma areolata*, *C. propinqua*, *C. rotundifolia*, *C. rhamnoides*, and *Ileostylus micranthus* growing out of the top of the compact bushes. South across the valley towards the stream was a swamp forest of *Laurelia novaezelandiae*, *Rhapalostylis sapida*, with occasional *Dacrycarpus dacrydoides* and *Cordyline australis*. Crossing the boundary fence into Kahurangi National Park, there was an immediate increase in the density of regenerating native species, with the whole suite of species you would expect to find, including some more local endemics e.g., *Hebe townsonii*. Up towards the bluffs and taller forests interesting finds included an endemic *Myosotis* sp., *Melicytus* “Burnett” and *Lepidium flexicaule*, all either on, or just under, the bluffs.

#### 11 Feb 2017 Barry Hadfield Nīkau Reserve

This 11-ha DOC reserve is managed by Kāpiti Coast District Council. Greater Wellington Regional Council staff service twelve possum bait-stations in the impressive coastal nīkau/kohekohe. As a result, palatable species are now regenerating well. The reserve, which rises from 20 m to 160 m above sea level, is traversed by two tracks. We climbed the older, northern track, and descended the newer, southern track. Among the significant additions to the list were kahikatea and miro, both found by someone who ‘answered the call of Nature’ 30 m off the track! How often finds are made on such occasions! Other additions included black maire, putaputawētā, the ferns *Adiantum aethiopicum*, *A. cunninghamii* and *A. diaphanum*, *Loxogramme dictyopteris* and *Pteris macilenta*, *Microtis unifolia* agg. *Carex banksiana*, *Gahnia pauciflora*, *Libertia (grandiflora?)*, and *Stellaria parviflora*. Among the more worrying weeds are *Asparagus scandens*/climbing asparagus and on the northern track, the fern *Pteris cretica*.

#### 4 March 2017: South Coast Seaweeds

We ventured to Te Raekaihau, the point between Houghton Bay and Lyall Bay with the goal of learning some of the common seaweeds. New Zealand is home to some 800 species of seaweeds, which can be divided brown, green and red groups. These major groups differ in the coloured pigments that they use to photosynthesise. Browns seem easiest to learn, some of the green species are also relatively easy to identify but there are many species of red that seem bewilderingly similar.

The brown seaweeds that we saw included: *Durvillaea antarctica* (bull kelp), distinctive for its immense size; *Hormosira banksii* (Neptune’s necklace) with its linked brown spheres; *Landsburgia quercifolia* with its oak-shaped blades, the introduced and weedy *Undaria pinnatifida* with its frilly base; *Macrocystis pyrifera* (giant kelp) which has floats between its blades and main axis; *Lessonia*

*variegata* with linear blades from much-branched 'stalks'; *Ecklonia radiata* with many lobes from a flattened central axis that arises from a robust cylindrical stalk; *Carpophyllum maschalocarpum* (common flapjack) with flattened blades and axes; species of *Cystophora* with branched, tubular "leaves"; and two species of *Marginariella* with their distinctive cylindrical fertile structures. Greens included the self-evidently named sea lettuce (*Ulva*), sea rimu (*Caulerpa brownii*), and sea grapes (*C. geminata*).

1 April 2017: Mt Kaukau (445 m) and Te Wharangi ridge to south

Vegetation on the ridge is low, wind-shorn scrub, previously pasture. We started from the TV mast on Kaukau, having driven up the access road in low cloud, which lifted late morning, aided by a strong northerly. The group botanised mostly along the ridge, with one diversion off the side into a relatively sheltered gully. The low, wind-shorn scrub comprised mostly *Coprosma rhamnoides* and *Raukaua anomalus*, often growing together, and usually with the *Coprosma* to windward. There was also a fair amount of gorse and Darwin's barberry. Closer inspection under the shrub cover revealed a surprising variety of herbs and ferns, and a less surprising selection of weeds. Highlights were large, spreading, but low plants of *Lophomyrtus bullata*, several species of *Hymenophyllum* including *H. minimum*, a number of climbers including *Clematis forsteri*, *Metrosideros fulgens* and *M. diffusa*, *Rubus cissoides* agg., *Muehlenbeckia complexa* and *Parsonsia heterophylla*.

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## ■ Nelson Botanical Society

Anniversary Weekend Camp, Arthur's Pass, 27- 30 January

Day 1: Craigieburn Ski field

We looked out on tussock dominated by *Chionochloa pallens* subsp. *pilosa* and patches of *Chionochloa macra*, interspersed with *Aciphylla scott-thomsonii* and *Celmisia lyallii*. The main *Hebe* in this zone was *H. pinguifolia* while *Gaultheria depressa* var. *novae-zelandiae* and the taller *G. crassa* were plentiful and we found *G. nubicola* in a gully. We also found *Brachyglottis bellidioides* and *B. lagopus* together with *Geum cockaynei*, *G. uniflorum* and *G. leiospermum*. Spectacular clusters of *Euphrasia laingii* and *Ourisia caespitosa* were admired. Mats of *Parahebe decora* were interspersed with *Schizeilema hydrocotyloides* and many *Epilobiums*, including *E. atriplicifolium*, *E. glabellum*, *E. chlorifolium*, *E. macropus*, *E. brunnescens* ssp. *minutiflorum* and *E. pernitens*. We found *H. haastii*, *H. epacridea* and *H. subalpina*, *H. lycopodioides*, *Parahebe decora*, *Leonohebe tetrasticha* and *Chionohebe ciliolata*. The day finished with finding *Leucogenes grandiceps* and *Raoulia grandiflora* at the top of the ski field.

Day 2: Otira Valley

The crew set off from the Otira car park and within 20 metres we had our first orchid, *Waireia stenopetala* and then *Euphrasia cockayneana*. There was pygmy pine, yellow silver pine and *Lepidothamnus laxifolius* x *L. intermedius*, *Pentachondra pumila*, *Androstoma empetrifolium*, *Leucopogon fraseri*, *Coprosma pseudocuneata*, *C. fowerakeri* and *C. crenulata*. This was a walk of the daisies – *Brachyglottis rotundifolia*, *B. bidwillii*, *Olearia nummulariifolia*, *Olearia colensoi*, *Olearia arborescens*, *O. ilicifolia*, *Celmisia walkeri*, *C. verbascifolia*, *C. armstrongii*, *C. du-rietzi*, *Brachyglottis bellidioides* var. *crassa* and *Dolichoglottis scorzonerooides*. The show of the day must go to *Celmisia semicordata*. We also saw *Parahebe cheesemani*, *P. linifolia*, *Hebe macrantha* ssp. *macrantha*, *H. canterburiensis*, *H. macrocalyx* ssp. *macrocalyx*, *H. odora*, *Leonohebe ciliolata*, *Ourisia calycina*, *O. macrophylla* and *O. caespitosa*.

Day 3: Arthur's Pass Village and Devil's Punchbowl

We diverted towards the DOC centre to admire the flowering *Alepis flavida* growing on mountain beech. We then headed to the start of the Devil's Punchbowl Falls track. We checked out the prostrate plants growing in the gravels by the car park: *Raoulia australis*, *R. hookeri* and *R. parkii* together with *Coprosma brunnea* and *Parahebe decora*. In the forest, the red-tinged *Astelia nervosa* was striking, along with *Pseudopanax linearis*. *Blechnum montanum* hung along the bank and trees and shrubs such as *Archeria traversii*, *Halocarpus biformis*, *Metrosideros umbellata* and *Hoheria glabrata* attested to the upland nature of this forest. A sharp-eye spotted *Pterostylis oliveri*. Near the



falls we found *Hierochloe cuprea* but the main attraction was the flowering cluster of *Ourisia macrophylla* ssp. *lactea* and *Aporostylis bifolia*.

#### March Fieldtrip: Moa Park, Abel Tasman National Park

Twelve members made the walk to Moa Park. Everyone saw the trunk-less tree fern, *Cyathea colensoi*. *Gaultheria antipoda*, *G. antipoda* x *G. depressa* var. *novae-zelandiae*, *G. depressa* var. *depressa*, *G. depressa* var. *novae-zelandiae*, *G. macrostigma* and *G. macrostigma* x *G. depressa* var. *novae-zelandiae* were all heavily laden with fruit and an attractive *Cordyline indivisa* stood out from the bush. We came across several dead *Libocedrus bidwillii* and on their trunks were carpets of *Hymenophyllum malingii*. Two finds that caused discussion were: *Brachyglottis rotundifolia* and *Olearia* x *mollis*. Examples were seen of *Dracophyllum traversii* and *D. elegantissimum* and later in the heath vegetation we found flowering *Celmisia spectabilis* and *C. discolor*. A small, tufted, grass-like plant was *Oreostylidium subulatum* and there was the occasional patch of *Raoulia glabra* in sandy areas and a few *Gentianella bellidifolia*.

#### Totaranui Camp, 7–10 April

##### Day 1: Headlands Track

Most of the group arrived at the Ngārātā Homestead in time for a short afternoon of botanising along the Headlands Track. Most of the track was through regenerating forest, with some areas of tall beech and massive northern rātā. At the top we enjoyed lovely views down to Tōtaranui. On the way down, in failing light, we came across a lovely patch of flowering *Earina autumnalis* sprawling across the ground.

##### Day 2: Waiharakeke Track through to Tōtaranui

We headed off to the Waiharakeke Track where we soon spotted *Aseuosmia pusilla*, with bright-red berries and *Raukaua edgerleyi*. Then we discovered *Botrychium biforme* near the track and *Rumohra adiantiformis* on tree trunks. The bush contained magnificent mature trees, including: *Prumnopitys ferruginea*, *Prumnopitys taxifolia*, *Rhopalostylis sapida*, *Fuscospora solandri*, *Metrosideros robusta*, *Laurelia novae-zelandiae* and *Kunzea ericoides*. We walked on to Goat Bay through mature forest and found *Adiantum cunninghamii* and also *A. diaphanum*.

##### Day 3: Separation Point

Sixteen of us walked towards Separation Point and spotted an epiphytic *Earina* that didn't seem to fit either *E. autumnalis* or *E. mucronata* and could be the less-well-known *E. aestivalis*. Along the coastal track we found *Osplismenus hirtellus* subsp. *imbecillus*, a new record for this National Park. We were surprised to see three plants of *Orthoceras novae-zeelandiae*, still in flower. On the Point there is an interesting stand of *Corynocarpus laevigatus*, a relic of Maori planting and on the nearby coastal cliffs we found a solitary *Melicytus crassifolius*. In the small patches of coastal turf we recorded *Spergularia tasmanica*, *Chenopodium triandrum*, *Crassula moschata* and *Apium* 'slender'. On the return we saw *Deparia petersenii* subsp. *congrua* and one patch of *Cheilanthes distans*.



*Orthoceras novae-zeelandiae* near Separation Point. Photo: Steve Palmer

##### Day 4: Wainui Falls and Pōhara

We drove to Wainui Falls, where there was a clump of *Hypolepis dicksonioides* in an area of disturbed ground. An adjoining group of *Hypolepis ambigua* provided a contrast. *Notogrammitis heterophylla* was found on a rocky bank and nearby *Hymenophyllum dilatatum*. While exploring mossy banks we saw *Pterostylis alobula* in flower. We were able to enjoy lunch at Shannel's, overlooking coastal forest at Pōhara, where his rare plant area contained some delights: *Pimelea mimosa*, probably extinct in the wild and *Leptinella filiformis*. There was an area for Nelson endemics with *Hebe ochracea*, *H.*

*townsonii* and *Olearia polita*. The collection of *Melicytus* species was wonderful, as was a range of uncommon small-leaved coprosmas.

#### April Talk: "Spring in the Eastern French Pyrenees" - Sue Hallas

From Estavar, east of Andorra we walked different valley tracks to subalpine and alpine meadows between 2300 and 2800 m. To name a few plants of interest: *Allium ursinum*, *Ajuga pyramidalis*, *Gentiana pyrenaica*, *Rhododendron ferrugineum* and *Dactylorhiza maculata*. At Val d'Eyne the large golden *Gentiana lutea* was a delight and the blue *Eryngium bourgati* was stunning. We walked to Puigmal d'Err and enjoyed the sights of *Jasione crispa*, *Erysimum ochroleucum*, *Myosotis pyrenaica*, *Gentiana verna* and many *Saxifraga*. Another excursion took us to Val de Nuria and through Andorra to Spain. In the subalpine landscape were *Gentiana campestris*, alpine wild basil, *Androsace villosa* and even *Botrychium lunaria* and *Asplenium septentrionale*. At the Gorge du Segre we photographed *Sempervivum arachnoideum*, *Lilium martagon*, *Prunella grandiflora*, *Ononis natrix* and *Saxifraga paniculata*.

#### FUTURE EVENTS

June 18 Maitai Caves.  
June 19 Talk by Jan Clayton-Greene.  
July 16 Ngatimoti QEII covenant.  
July 17 Talk by Rowan Hindmarsh-Wells.

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## NOTES AND REPORTS

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### ■ Correction

The first sentence of the third paragraph of Gardner (2017) should read: The name, written "kilmogue" by Lord Howe's early settlers and botanist-visitors, was applied to the native bottlebrush *Melaleuca howeana* (but not to the island's single *Leptospermum* species, *L. polygalifolium*, a less familiar plant of higher altitudes, which was always known just as "teatree").

Gardner, R. 2017. A Māori plant-name from Lord Howe Island. *New Zealand Botanical Society Newsletter* 127: 7–8.

### ■ A cache of old New Zealand fern records: the United States Exploring Expedition in the Bay of Islands.

Rhys Gardner, rhysgardner@hotmail.com

#### Introduction

This article concerns a nineteenth century work of floristic botany, substantial and well-produced but nevertheless overlooked by our flora-writers (Hooker 1864, Cheeseman 1906, 1925; Allan 1961). It is the account of the ferns and lycophytes collected by the United States Exploring Expedition ("USEE") in the Pacific Ocean region (including North and South America), and consists of a text-volume and an Atlas of engraved plates (Brackenridge 1854, 1855).

#### The USEE in the Bay of Islands

On 30 March 1840, not long after the treaty-signing at Waitangi, the expedition's principal ship *Vincennes* anchored in the Bay of Islands' Kawakawa River, conveniently opposite the residence of American "consul" Mr James R. Clendon. Commanded by hard-driving Lieutenant Charles Wilkes, the USEE was halfway through its four years long voyage of scientific discovery and map-making, having visited South America, the Tuamotu, Tahitian and Samoan island groups, eastern Australia, the Auckland Islands, Macquarie Island, and Antarctica ("Wilkes Land").

Two of the USEE's smaller ships, *Porpoise* and *Flying Fish*, were already in the Bay of Islands, as were the artists and most of the "scientific gentleman" (including naturalist Charles Pickering), who had made a separate passage from Sydney. The conchologist, Joseph Couthouy, had also arrived independently, via Cook Strait and Banks Peninsula, but had not collected at these places (Wilkes 1845a, 1845b, Stanton 1975, Viola & Margolis 1985, Philbrick 2004).

Plant-collecting at the Bay of Islands would have been done by Pickering and also, after the arrival of the *Vincennes*, by William Brackenridge, a fit and industrious man who had been appointed "horticulturalist" and then, "assistant botanist". It is hard to be sure of this, because USEE specimens seldom carry a collector's name (but the Bay of Islands algal specimens are attributed to Brackenridge alone). It does seem unlikely that Charles Rich, "botanist" on the *Vincennes*, would have exerted himself greatly. His talents have been described as being for smoking cigars and telling stories, and back home he muddled the specimens then avoided writing them up by going off to the Mexican-American war. (This is the traditional view of Rich; for a more sympathetic one see Eyde 1986).

Despite the USEE's facilities for examining the coastline and offshore islands there seems to have been no sustained effort in this regard. Two brief overland trips were made: Pickering went across to Waimate and the Hokianga, and some of the party went to Whangaruru ("Wangarara").

#### The publications

The naturalists did not publish any account of their time in the Bay of Islands. Wilkes' generalized narrative has some ethnography but very little biology, being mostly about local Maori personalities and how disadvantaged the U.S. was going to be by Britain's assumption of sovereignty. The expedition left the Bay of Islands on 6 April, bound for Tonga: "I believe that no person in the

squadron felt any regret at leaving New Zealand, for there was a want of all means of amusement, as well as of any objects in whose observation we were interested" (Wilkes 1845b: 3).

Publication of the USEE's plant discoveries was greatly delayed by bureaucratic mismanagement and political interference. Asa Gray of Harvard University eventually took over the job (and in 1850 was able to travel in Europe for a year to do this effectively). But even he, America's most eminent botanist, could get published only the first half of his account of the Southern Pacific's flowering plants (Gray 1854); the other half remains in manuscript at Harvard.

Brackenridge took on the ferns but appears not to have had special knowledge of this group and was hampered by not having all the relevant literature. He was able to correlate his names with those of Cunningham (1837), but had no help from overseas workers, and finished his writing several years too early to be able to take advantage of Hooker's (1855) *Flora Novae-Zelandiae*.

An additional misfortune came when a warehouse fire reduced the number of copies of Brackenridge's and Gray's works to fewer than a hundred each, making them rarities right from the moment of publication. Perhaps not even Kew had, or knew of, these two works, with Hooker (1864: 14) saying that although the USEE had visited the Auckland Islands "very few, if any, plants appear to have been collected there".

### Assessment

Allan Cunningham (1837) recorded that he or his brother Richard had collected somewhat more than sixty ferns and lycophytes from the Whangaroa-Bay of Islands-Hokianga region. The USEE got a similar number, along with several hundred algae, mosses, gymnosperms and flowering plants. They collected some species several times (Smithsonian Institution 2017) but it seems unlikely to me that regular collecting of duplicates was carried out.

Brackenridge's work contains sixty-one "Bay of Islands" species (omitting the wrongly localised *Cyathea lunulata*), and two from the Auckland Islands. These are listed below in Appendix 1, under Brackenridge's names and in the order he arranged them. For quite a few, a "Bay of Islands" attribution is shared with "Sydney" or "Feejee" or "Chile".

The notes that accompany Brackenridge's names range from very slight to quite adequate. There are a few well-observed remarks, e.g., Cunningham is chided for saying *Blechnum fraseri* is a scandent plant. But no New Zealand fern novelty is described, and Cunningham's best find, of *Loxsonia* at the Kerikeri Falls, was not duplicated.

In the first "popular" and comprehensive account of New Zealand's higher-plants Hooker (1864) did not refer to the USEE's collections. Cheeseman (1906), on the authority of other writers apparently, cited Brackenridge in the synonymy of just four ferns (now known as *Diplazium australe*, *Deparia petersenii*, *Blechnum filiforme*, and *Pteris macilenta*), but subsequently omitted the *D. petersenii* reference (Cheeseman 1924: 44).

Allan (1961) noted Brackenridge's synonym for *Pteris macilenta*, and added two more, for *Trichomanes endlicherianum* (Brackenridge's *T. erectum* and *T. tenue*, although their author did not say that these were New Zealand species). The "Taxonomic Annals" section of Allan (1961) does not include "Brackenridge 1854", nor does the relevant *Flora of Australia* volume (McCarthy 1998).

The USEE's specimens can be found online in the United States National Herbarium (US) database (Smithsonian Institution 2017). All except a few mosses and algae are imaged. A search I carried out using "U.S. Exploring Expedition and "New Zealand" brought up 394 records, in good agreement with the statement by Allan (1961: xiv, under "1854 Gray, A.") that the USEE collected "some 398" specimens in New Zealand.

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**Appendix 1:** New Zealand ferns and lycophytes, as listed by Brackenridge (1854).

All records are from the Bay of Islands-Hokianga region, except for two from the Auckland Islands (*Asplenium scleroprium*, *A. obtusatum*). The record "*Alsophila lunulata*, Bay of Islands" is omitted as probably erroneous (but US 95828, -9, its voucher, has no modern identification).

*Polypodium tenellum*, *P. rugosulum*  
*Goniopteris pennigera*  
*Niphobolus rupestris*, *N. bicolor*  
*Drynaria billardieri*, *D. pustulata*  
*Dictyopteris attenuata*  
*Stenochlaena heteromorpha*  
*Cheilanthes ambigua*, *C. tenuifolia*  
*Platyloma rotundifolia*  
*Adiantum affine*, *A. hispidulum*, *A. pubescens*  
*Litobrochia macilenta*, *L. vespertilionis*  
*Pteris tremula*, *P. scaberula*, *P. esculenta*  
*Lomaria discolor*, *L. lanceolata*, *L. procera*, *L. fraseri*  
*Doodia aspera*, *D. kunthiana*  
*Asplenium obliquum*, *A. scleroprium*, *A. obtusatum*, *A. flabellifolium*, *A. falcatum*, *A. flaccidum*, *A. bulbiferum*, *A. australe*  
*Lastrea velutina*, *L. glabella*  
*Polystichum coriaceum*, *P. hispidum*  
*Lindsaea linearis*, *L. trichomanoides*  
*Trichomanes reniforme*, *T. elongatum*  
*Hymenophyllum tunbridgense*, *H. dilatatum*, *H. flexuosum*, *H. flabellatum*, *H. demissum*  
*Dicksonia squarrosa*  
*Cyathea dealbata*, *C. medullaris*  
*Gleichenia hecistophylla*  
*Mertensia flabellata*  
*Lygodium articulatum*  
*Schizaea propinqua*, *S. bifida*  
*Todea hymenophylloides*  
*Ophioglossum elongatum*  
*Botrychium australe*  
*Tmesipteris forsteri*  
*Lycopodium laterale*, *L. densum*, *L. varium*, *L. volubile*.

■ **Chilean mayten (*Maytenus boaria*) – a ticking time-bomb?**

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Experts reckon that about 20 new plants ‘jump the garden fence’ each year to become naturalised in New Zealand (Ewen Cameron, Auckland Museum, pers. comm.).

One such plant that I, and others, have become increasingly concerned about – particularly around my home area of Canterbury – is *Maytenus boaria* (also called Chilean mayten, mayten or maiten). Unfortunately, this species now appears to be a ticking time-bomb and has real potential for explosive spread to become a major environmental weed throughout New Zealand.

This article describes what Chilean mayten is, its history of introduction, why it’s become a problem, and what we can do about it.

**What is Chilean mayten?**

There are more than 50 species of *Maytenus* and most are tropical. Several are said to have been cultivated in New Zealand<sup>1</sup>, but *M. boaria* is by far the most widely grown due to its cold-tolerance and horticultural qualities. Chilean mayten belongs to the Celastraceae family and is native to South America, naturally occurring from about 30 to 50°S in Chile and Argentina.



**Fig. 1.** Habit of 30-year old tree growing in the CASC grounds, Lincoln. This female tree is the seed source that has caused its spread on that campus. It has now been cut down and the stump poisoned. Photo: Murray Dawson.



**Fig. 2.** Trunk showing fissured grey bark. Photo: Murray Dawson.

This evergreen tree is fairly hardy and drought resistant. It’s cultivated as a small to medium sized tree, typically reaching 6–8 m after several decades (Fig. 1). However, under optimum conditions and given enough time it can eventually grow up to 20–30 m tall. It has fissured grey bark (Fig. 2).

When mature, this graceful tree develops

a straight trunk and pendulous branchlets that sway in the wind, similar in effect to a weeping willow (*Salix babylonica*) or the Western Australian peppermint tree (*Agonis flexuosa*).

Chilean mayten leaves are alternately arranged, glabrous (hairless), glossy and dark green on the upper surfaces, lighter green on the lower surfaces, and shortly petiolate (with leaf-stalks 1.3–6 mm long). The leaves are relatively small ((15–) 20–60 (–75) mm long), narrowly lanceolate to elliptic, and with finely serrated margins (Fig. 3).



**Fig. 3.** Characteristic serrated foliage and small flowers. Female shrub. Photo: Murray Dawson.

<sup>1</sup> *Maytenus magellanica* (Lam.) Hook.f. and *M. vitis-idaea* Griseb. (endemic to South America), *M. canariensis* (Loes.) G.Kunkel & Sunding (endemic to Spain), *M. silvestris* Lander & L.A.S.Johnson (endemic to Australia), and *M. vitiensis* (A.Gray) Ding Hou (of the South Pacific).



**Fig. 4.** Male flowers. **A**, flowers showing yellow anthers. **B**, close-up side view of flower. Photos: Murray Dawson.

In New Zealand it flowers from late August to early October. Its flowers are solitary or arranged in axillary clusters (arising from the stems), small (about 5 mm in diameter), 5-merous, greenish-yellow and relatively inconspicuous. There are separate male (Fig. 4A–B) and female (Fig. 5A–B) flowers – New Zealand plants may be either all-male or all-female (i.e., they are dioecious)<sup>2</sup>.

Seed formed on female plants mature from March to June, and are surrounded by orange to dark red coloured fleshy arils (Fig. 6A–B). The persistent

fruit capsules are yellowish-brown in colour (Fig. 7A–B).

#### Early garden records

Searching the outstanding Papers Past resource (<https://paperspast.natlib.govt.nz>), the earliest record that I found of *Maytenus* being introduced into New Zealand is 1881, where “*Maytenus pendulinus*, the South American spindle tree” is noted as a new arrival, as part of the Christchurch Domain Board’s plant exchange programme (Some New Arrivals, *The Star*, Issue 4161, August 22, 1881, p. 3). *Maytenus pendulina* Steud. is probably a synonym for the currently accepted name *Maytenus boaria* Molina.

It is apparent that mayten successfully established from early imports such as this, as a large specimen of “*Maytenus chilensis*” was highlighted as growing in the Christchurch Botanic Gardens in a 1945 guide (Visitors’ Guide to Christchurch, *The Press*, Vol. LXXXI, Issue 24594, June 16, 1945, p. 6). *Maytenus chilensis* DC. is a valid synonym for *Maytenus boaria*. In 1962, Bill Sykes collected a herbarium specimen (Allan Herbarium, CHR 130131) from a tree he estimated to be a remarkable 100 ft (30 m) tall, cultivated in the gardens. In the same year, 1962, Diane Smith also lodged a specimen collected in the gardens (Christchurch Botanic Gardens Herbarium, CHBG 1738).



**Fig. 5.** Female flowers. **A**, flowers showing stigmas and superior ovaries. **B**, close-up side view of flower. Photos: Murray Dawson.

In 1929, “*Maytenus escallonicus*” became commercially available in New Zealand, and was listed as a new shrub in a Duncan & Davies nursery catalogue of that year. This species name does not appear to be valid. However, in a later Duncan & Davies catalogue (c. 1947) the name “*Maytenus chilensis*” is instead used, and that catalogue description is a good match for Chilean mayten: “E [evergreen]. In maturity the slender branches develop a weeping habit, which in combination with the small bright green leaves makes this a very attractive tree. 12 ft.”

Eastwoodhill Arboretum’s stock records (unpub. data) show that their first accessions of this tree date from 1935, from Stevens Brothers Nursery in Bulls, New Zealand. Eastwoodhill’s 1948 imports came from Hillier Nurseries in Winchester, UK.

#### Chilean mayten as a weed

<sup>2</sup> I have not seen male and female flowers together on the same plant (monoecious), although closer study of New Zealand material may be warranted. Some overseas accounts suggest that Chilean mayten is monoecious or polygamous (bearing some flowers with stamens only, some with pistils only, and occasionally some with both, on the same or different plants).



**Fig. 6.** Mature fruit. **A**, fruit showing orange-red arils. **B**, close-up view. Photos: Peter Heenan, © Landcare Research 2015.

Webb (1988) recorded Chilean mayten as naturalised in the *Flora of New Zealand, Vol. 4*. He mentioned two collections from Canterbury – one from a footpath and gutter in Christchurch and the other from a single thicket growing amongst indigenous trees at Church Bay, Banks Peninsula.

I have examined these and other Allan Herbarium (CHR) specimens of Chilean mayten and the accompanying collectors' notes.

The late A.J. Healy (a weed expert from the then Botany Division, DSIR) noted in his 1975 collection from Clyde Road, Christchurch (CHR 326322; referred to by Webb 1988) that his specimens were taken outside of a residential section where planted trees were suckering out through the footpath and gutter channel.



**Fig. 7.** Old fruit capsules persisting on tree after the fruit has been dispersed. **A**, general view. **B**, close-up view. Photos: Murray Dawson.

In some growing conditions, these suckers can form dense thickets more than 10 m away from the parent tree. I'm not certain that suckering from a cultivated tree (even after it is cut down) represents a genuine naturalisation event in all cases, as material may not spread far beyond the confines of the original root zone<sup>3</sup>. For Chilean mayten, seedling spread is a more robust determiner of naturalisation and I would not consider 1975 as the year of naturalisation here.

Bill Sykes, and CHR 497744, collected by Hugh Wilson) may represent the earliest likely record of naturalisation from seedlings. However, unless you pull the emergent shoots out of the ground, it's difficult to confirm what material they are arising from. Central root leaders are characteristic of seedlings, and suckers arise from mature tree roots growing horizontally near the surface. The aforementioned herbarium specimens from Church Bay don't show any below ground parts.

1986 specimens from Hunters Gully above Church Bay (CHR 437248, collected by

In the Gisborne and Whanganui regions, there is additional evidence from herbarium collections of Chilean mayten escaping from cultivation.

<sup>3</sup> Conversely, for some species such as bamboos naturalised in New Zealand, soil excavation and transport to new sites can indeed lead to new wild plants.



In 1989, Bill Sykes collected specimens (CHR 463199A–C and CHR 463200A–C) from trees growing nearby but outside of the boundary of Eastwoodhill Arboretum. Bill returned in later years to collect female specimens cultivated within the arboretum (CHR 472607, collected 1991, and CHR 497192A–D, collected 1994). A management goal of Eastwoodhill is to remove Chilean mayten from the park, which involves cutting down the tree, removing all suckers and poisoning the stumps. Full control is difficult to achieve given their current resources (Dan Haliday, pers. comm.). Suckers are more easily controlled if stock are on-site to eat them, or if the tree has been planted as a lawn specimen so any suckers are constantly mown down.

More recently, in 2012, Colin Ogle collected for the Allan Herbarium obvious Chilean mayten seedlings complete with roots – these came from Bason Botanic Gardens, Westmere, near Whanganui (CHR 621564; Fig. 8). Colin tells me that he has alerted the Friends of Bason Botanic Gardens about the emerging threat that Chilean mayten presents. Hopefully, they will set about to remove at least the female trees from their gardens.



**Fig. 8.** Herbarium specimen (CHR 621564) collected by C.C. Ogle from Bason Botanic Gardens showing obvious seedlings. Photo: © Landcare Research 2017.

So why is Chilean mayten now becoming invasive more than 130 years after its first introduction into New Zealand? Why is this previously benign tree going rogue?

Full credit goes to Joe Cartman, Christchurch City Council Nursery Supervisor and a renowned plantsman, for unlocking this puzzle. He realised that up until the mid-1980s only male plants were sold by nurseries. This was based on observations he made of dozens of trees around Christchurch and elsewhere, all males and probably a tendency applicable to the rest of New Zealand at that time. Cartman commented that these male plants appeared to be uniform and probably from the same clone. Material would be easy to propagate vegetatively by pulling up suckering shoots (Fig. 9) and growing them on through root cuttings.

Unfortunately, this status quo changed. Cartman and McCombs (2002) noted that from the mid-1980s seed-grown plants started to appear on the market, and inevitably some of these were female. Birds love to eat the fleshy seed-containing arils and thus Chilean mayten has literally now gained wings in New Zealand. This

has allowed the species to disperse well beyond the original (all-male) plantings and to colonise new areas.

Cartman and McCombs (2002) recounted that around 1990, several of the seed grown plants were purchased and planted out in a shelterbelt at the Christchurch City Council nursery in Gardeners Road, Harewood (e.g., CHR 478917, collected from the nursery by Bill Sykes in 1988). Within a few years of planting, Joe Cartman observed numerous seedlings emerging in the vicinity of the original tree (e.g., CHR 567754A–B, collected by Peter Heenan in 2003). They cut down this tree but found the seedlings and suckers persistent and difficult to control. They repeatedly poisoned the stump and removed regrowth. Joe Cartman (pers. comm.) tells me that Roundup® kills the seedlings (using a ×1.5 dose rate and with penetrant added).



**Fig. 9.** Suckering from a tree that was cut down more than 15 years ago at the CASC grounds, Lincoln. Photo: Murray Dawson.

It's a similar story at my workplace campus, the Canterbury Agriculture and Science Centre (CASC) at Lincoln, Canterbury. Landscaping planted in the early 1990s by the former Ministry of Works included a female Chilean mayten tree in the South American courtyard garden (Fig. 1–2). Fast forward to the present, and sure enough, saplings are rampant throughout our native and exotic plantings on campus, some male and others female.

At the nearby Lincoln University campus, suckers are persisting from trees that were originally planted there but have been cut down, and fully mature trees that are still cultivated and also suckering (Fig. 10). Roy Edwards (pers. comm.) has seen plants appearing in parts of the amenity area where it was never planted, suggesting that it may also be spreading on that campus by seed dispersal.

John Stevens told me of his personal horror story of Chilean mayten infesting his native plantings at Willowbridge, near Waimate, and his efforts to control it. From 2001, John planted more than 10,000 native plants on 4 ha of his land. This revegetated area gained a QEII covenant in May 2007. Unfortunately, around 2002–2003 his neighbour on the opposite side of the road planted a shelterbelt that included some 50 plants of Chilean mayten, recommended for that purpose by a local plant nursery. Obviously, some of those trees must have been females as 13–14 years after the shelterbelt was planted, thousands of Chilean mayten seedlings became apparent in John's native plantings across the road. These appeared as isolated plants and also thick patches of seedlings (particularly under native trees and shrubs favoured by the birds to roost on). John's neighbour readily agreed to kill the Chilean mayten from the shelterbelt, and together they trialled different treatments in 2016. These trials included spraying the foliage of the 4 m tall trees with Starane® herbicide, and drilling and filling holes in the trunks with neat Roundup®, Tordon® and a 50:50 mix of the two. They found of all treatments, spraying with Starane® (60 ml per 10 litres) to be the most effective, killing off all adult trees along with their suckers that were growing up to 6 m away from the parent trees (some, but not all, of those suckers were sprayed along with the parent foliage). Drilling and filling trunks with Tordon® was the next most effective treatment, and Roundup® on its own was less effective<sup>4</sup>. Starane® spray also effectively killed off Chilean mayten seedlings.

Based on NatureWatch NZ 'Citizen Science' observations, Central Canterbury appears to be a primary source of spread in New Zealand (Fig. 11). Several recent observations include:

- Suckers coming up in a garden more than ten years after the adult tree was killed by Jon Sullivan and the stump and all suckers being liberally treated with Vigilant® herbicide gel (<http://naturewatch.org.nz/observations/3659022>).
- An observation by Jon Sullivan of a wild sapling found in the middle of Bottle Lake Plantation growing under tall pines (<http://naturewatch.org.nz/observations/2537947>).
- A mature female tree with numerous seedlings or suckers in Kaiapoi (<http://naturewatch.org.nz/observations/1000227>), and observations by Sue McGaw in many other locations on earthquake abandoned wasteland in Kaiapoi.

Chilean mayten is a master of disguise and hides amongst native shrubs, so it may well have been overlooked in other regions. When it's still a shrub, it looks rather nondescript with its small evergreen leaves and (unless in fruit) few distinguishing features. Chilean mayten looks a lot like a native New Zealand plant, and resembles a small leaved māhoe (*Melicytus*) or perhaps a ribbonwood (*Hoheria*). Worse, it's very shade tolerant so can co-exist with and then potentially outcompete in native ecosystems, restoration areas, and amenity plantings.

As a result of its weedy characteristics, Chilean mayten was added to the National Pest Plant Accord (NPPA) in 2012, banning its sale, distribution and propagation in New Zealand.

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<sup>4</sup> Cartman and McCombs (2002) also tried drilling and filling with Roundup®. They note that "Plants have been drilled and the holes filled with 60% Roundup solution. This kills about half the treated stems. In comparison, this method has a 100% kill of hawthorn, spindleberry, sycamore and eucalypts elsewhere within the shelterbelt. Poisoning is necessary as merely cutting the plants stimulates a mass of root suckers."



**Fig. 10.** Suckers (shown in the foreground) from a large mature tree (background) cultivated at Lincoln University, Canterbury. Photo: Murray Dawson.

It was with some surprise then that I spotted mayten listed in a landscaping and tree planting appendix to the proposed 2014 Christchurch Replacement District Plan. Needless to say, because of its NPPA status, I tendered a written submission pointing out that it cannot now be considered for planting under any circumstances. This is somewhat ironic as Joe Cartman and Kate McCombs, who raised the alarm in the first place, are (and were respectively) Christchurch City Council employees. Also, their informative 2002 article no longer appears to be retrievable directly from the CCC website.

Maybe Environment Canterbury and other regional authorities can step up and include Chilean mayten in their next Regional Pest Management Strategy? I think that there is a strong case for doing so.

What can you or I do about this ticking time-bomb? I repeat Cartman and McCombs (2002) plea for early intervention, now made nearly 15 years ago. We need sharp eyes looking out for this new pest plant. Saplings and trees – of females in particular – should be hunted down and actively removed as soon as possible to prevent further spread of seedlings. The cost of inaction could well be a new environmental weed becoming established throughout New Zealand, and perhaps capable of invading native forest.

Let's hope that it's not already too late.

I've 'walked-the-talk' and had the adult tree (Fig. 1) and a female sapling on my campus cut down. No doubt we will be spending several frustrating decades removing the resulting suckers and a legacy of seedlings.

### Summary

A timeline of known information for Chilean mayten establishment in New Zealand is:

- 1881: Introduced into the Christchurch Botanic Gardens from overseas.
- 1929: Sold commercially by Duncan & Davies nursery, New Plymouth.
- Mid-1980s: Seed-grown plants started to be sold, including females.
- 1986/1989: Recorded as naturalised from herbarium specimens.
- 2002: Joe Cartman and Kate McCombs published an article outlining the emerging weed threat.
- 2012: Chilean mayten was added to the NPPA list.
- Present day: Citizen Science observations indicate the expanding distribution of this species, particularly in Canterbury.

Weedy characteristics of Chilean mayten include:

- Long-lived.
- Drought resistant.
- Persistent suckering from roots.
- Resistant to poisoning.
- Very shade tolerant but also grows in full sun.
- Difficult to distinguish from New Zealand native plants.
- Flowers and fruits from an early age (3–5 years, 2 m tall).

- Seed readily dispersed by birds.

### Acknowledgments

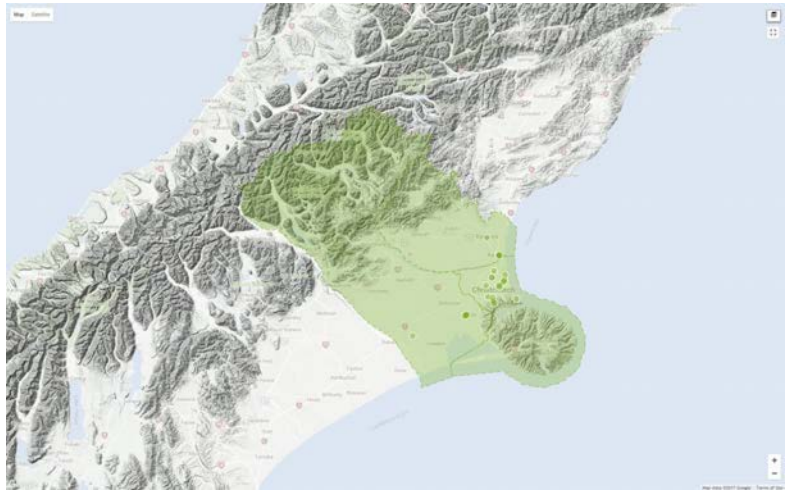
I thank Joe Cartman, John Clemens, Roy Edwards, Dan Haliday, Sue McGaw, Colin Ogle, John Stevens and Jon Sullivan for helpful comments on drafting this article, and Peter Heenan for permission to use his excellent fruit images (Fig. 6). My images used in this article have also been added to the NatureWatch NZ platform.

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- New Zealand Plant Conservation Network: *Maytenus boaria*: [www.nzpcn.org.nz/flora\\_details.aspx?ID=3460](http://www.nzpcn.org.nz/flora_details.aspx?ID=3460)
- Papers Past (digitised historic New Zealand newspapers): <https://paperspast.natlib.govt.nz/newspapers/CHP19450616.2.45?query=Maytenus>
- The Plant List: Angiosperms – Celastraceae – *Maytenus*: [www.theplantlist.org/1.1/browse/A/Celastraceae/Maytenus/](http://www.theplantlist.org/1.1/browse/A/Celastraceae/Maytenus/)



**Fig. 11.** Distribution of *Maytenus boaria* in Central Canterbury. Map generated from NatureWatch NZ

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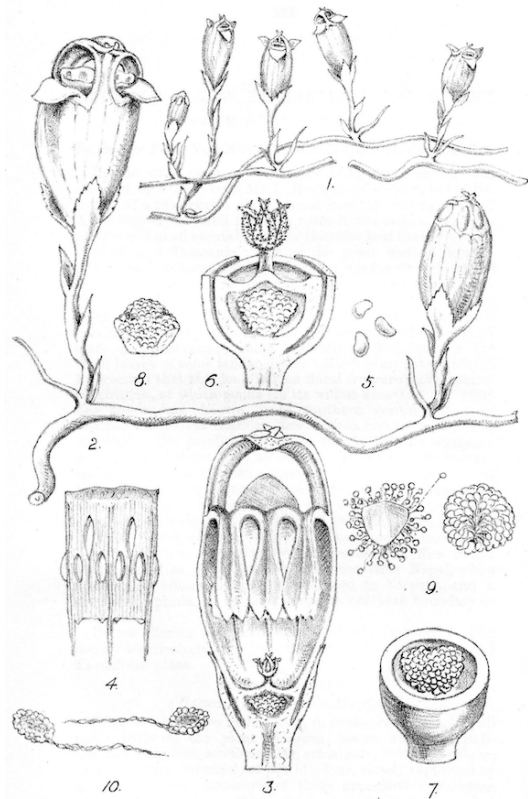
### ■ Biographical Sketch – Henry Hill (1849-1933)

**Val Smith**, 80 Mill Road, New Plymouth 4310.

Henry Hill, sometimes known as Henry Thomas Hill, was born on 24 October 1849 at Wollescote, a hamlet in the district of Stourbridge, in the West Midlands, England. His father Benjamin Hill was a horse nail-maker, and his mother Mary née Parkes, a nail-forging from nearby Lye. Henry was the third son and youngest of their five children. Nailing was an old trade usually carried out in domestic workshops, and life for man, woman and child was hard, hazardous and often short. Henry was orphaned before reaching his teens, and while his siblings laboured in the forge from a young age, he worked diligently at the Lye school, excelled in his studies and came to the notice of the Anglican vicar. With his encouragement and help he secured not only a five-year pupil-teacher apprenticeship in Birmingham in 1863 but also board in a clergyman's household. A scholarship in 1868 took Henry

to St Mark's Training College, Cheltenham, where he became a close friend of Emily Knowles, who was also from Lye. With a first-class teacher's certificate in 1870, he was sent to organise a group of new schools in Nottingham and fitted in extra-mural study to qualify in 1873 as a science and art master. His application for employment in New Zealand was successful, but required him to be married; Emily accepted his proposal and they married at Halesowen, Worcestershire, on 23 July 1873, twelve days before embarking on the *Meriope*, Emily as the ship's matron and Henry the schoolmaster.

Hill's first work in New Zealand was on administrative aspects of the new schools being built in Canterbury, until June 1875 when he was appointed headmaster of the new Christchurch East School, with Emily its first infant mistress. Combining teaching duties with part-time university studies and increasing family responsibilities – a nanny was employed to enable Emily to continue with her work – he graduated BA in 1878. There were to be four daughters and three sons of the marriage. Supported by glowing testimonials, his application for the position of inspector of schools for the Hawkes Bay Education Board was successful, and for the next 37 years he worked to improve the standard of education in the region. Like William Colenso before him, he spent many hours on horseback and often camped out in all weather, to cover his area twice a year. However, sometimes on early trips he was accompanied by Colenso – they were already known to each other through mutual scientific interests.



*Thismia rodwayi* from Cheeseman: *Illustrations of the New Zealand Flora 2*

Hill was particularly interested in the volcanic plateau of the central North Island, and presented many papers of the subject to the New Zealand Institute. For his contribution to scientific research he was made a fellow of the Geological Society of London in 1887. In 1903 he sent a damaged specimen of an unusual plant from Opepe, near Lake Taupo, to botanist Thomas Cheeseman. Further searches were unsuccessful until January 1907 when Hill, accompanied by the director of Dominion Museum Augustus Hamilton of Wellington, made another visit to Opepe and found a number of specimens in full flower. Seeing its similarity to the genus *Thismia*, but also noting differences, Cheeseman placed it in the closely related genus *Bagnisia*. He wrote, "It gives me great pleasure to associate Mr Hill's name with the species as some slight recognition of the long-continued interest he has taken in New Zealand botany, and of his unwearied kindness in supplying both Mr Colenso and myself with specimens of many interesting plants collected during his journeys in the interior of the North Island."

Reflecting his own start in life, Hill supported the education of Hamiora Hei until his return to the East Coast as a qualified lawyer. Henry Hill was an active member of the Anglican church, several local administrative boards and scientific institutions, and after retirement was mayor of Napier from 1917–1919. He continued his geological pursuits, making frequent ascents of the Ruapehu summits, but his later life was blighted by Emily Hill's death in 1930, the subsidence of a large part of his hillside section in the Napier earthquake and subsequent financial loss. He died at Napier on 15 July 1933.

#### ***Thismia rodwayi***

Cheeseman described *Bagnisia hillii* (*Thismia rodwayi*) as a minute colourless saprophyte, perfectly smooth in its parts, leaves wanting or reduced to minute scales, its habitat primeval woods at Opepe, near Lake Taupo, flowering in January. He added that it is usually found on mounds of decaying leaves and humus at the base of the trunk of kahikatea, and until the deep rose-pink colour of the first flower is spotted, is easily overlooked.

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## PUBLICATIONS

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### ■ Publications Received

New Zealand Native Orchid Journal 144 May 2017 *Gastrodia cooperae*, 2016 Hatch Medal to Mark Moorhouse, *Caladenia atrochila*, *Caladenia* 'Kaweka' and 'Bealey'.

Canterbury Botanical Society Newsletter 2017:4 Upcoming meetings and trips, meeting report on assisting post-fire native plant regeneration through seeding, trip report for Te Pirita Drylands.

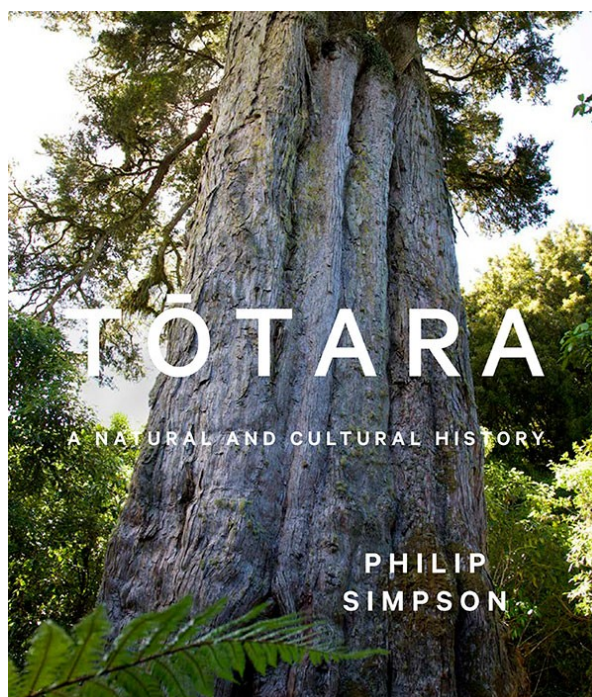
Canterbury Botanical Society Newsletter 2017:5 Upcoming meetings and trips, fieldtrip report for Rockwood Farm, Windwhistle.

Canterbury Botanical Society Newsletter 2017:6 Upcoming meetings and trips, meeting reports for the effects of deer and possums and Macquarie Island flora, trip report for Mt Grey.

### ■ Special offer for New Zealand Botanical Society members for Philip Simpson's book 'Totara'

In June Potton and Burton are distributing Auckland University Press's new book, ***Totara A Natural and Cultural History*** by Philip Simpson. For information on this book and to look inside follow this link to our website <http://www.pottonandburton.co.nz/store/totara>.

New Zealand Botanical Society members have been offered a 10% discount off the recommended retail price (RRP \$75.00) and free freight within New Zealand. To obtain this discount, (discounted price \$67.50) members can order from our website using a unique coupon code (BOT17) at the shopping cart. This offer expires on the 30<sup>th</sup> September 2017.





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This worldwide exhibition and its events will bring together institutions, artists, and the public to highlight the role contemporary botanical artists play in calling attention to the need to preserve our botanical diversity. Participating countries will provide digital slide shows of up to forty works, to be compiled with all other countries' images and shown at each venue during the run of each exhibition. Video sharing of openings, lectures, demonstrations, webinars, and other events may be part of each exhibition, so visitors can learn more about the earth's floristic regions and botanical wealth.

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Further your visitorship goals and broaden understanding of plant diversity. Highlight your own collections relating to the topic. Take advantage of educational and event opportunities relating to botanical art.

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- To build partnerships between artists, institutions, scientists, and the public.
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*Top:* ©2013 Joan McGann, Arizona Barrel Cactus (detail)