



Journal

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Editorial

Loder Cup to Brian Molloy

NZNOG member Brian Molloy was awarded the Loder Cup for 1990 at a conference in Tauranga recently.

The Cup was originally presented by Gerald' Loder to encourage the protection and cultivation of native plants in New Zealand. The 1990 presentation was accompanied by the words

"Brian Molloy is the botanist who has done important work on our karaka and other Pacific Island versions of the species. He is known for his work on *Pachystegia*, the Kaikoura tree daisy, and extensive botanical work throughout the South Island and the Chathams.

"We know a lot more about the ecology of the South Island, about vegetation patterns and processes,

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about specific plant groups (including our native orchids) because of the work of Brian Molloy.

"He has worked in esoteric botanic realms, in making the science accessible to the public and in the scientific and political processes necessary for the establishment of scientific reserves and forest parks."

Our sincere congratulations, Brian.

Can we find a black orchid?

Why isn't *Corybas carsei* as celebrated as the kauri and the kakapo? Or *Bulbophyllum tuberculatum* as prominent as the black robin and the black stilt? They are indeed all rare and precious living things.

Wild orchids are underemphasised symbols when compared with those ecological emblems, the trees and the birds, yet the mysterious orchids hold a very special place in the sentimental imagination.

We in the NZ Native Orchid Group have been, perhaps, tardy in recognising and taking advantage of that, though botanists have not in the past been slow to exploit the orchid in a good cause.

I do not wish to belittle the efforts of those who saved the black robin, nor of those who are trying to save the black stilt, nor to debase the birds themselves; but black is easy - to many, it is New Zealand's national colour, easily arousing feelings of pride or outrage. Must we wait to find a black orchid before we can marshal similar feelings and actions in the defence of threatened orchid species?

The Group and its activities, and thus the orchids, need a higher profile. The appearance of the Journal is designed to assist in that aim, the recent issue of NZ orchid stamps will help, and the efforts of Max Gibbs and others in establishing the Iwitahi Orchid Reserve near Taupo, and publicising the plants through newspaper articles have helped too, as have a number of other local and national activities, including a proposed regular native orchid feature in *Orchids in New Zealand* (Philip Tomlinson, editor).

But we need to market the plight of endangered orchids more actively. To this end Doug McCrae, our Conservation Officer, wonders whether the Group should affiliate with ECO, an incorporation of the environment and conservation organizations of New Zealand.

What do you think? Please write to Doug McCrae (address above) with your views.

The Te Paki orchid survey

It is a pleasure to include in this issue of the Journal Doug McCrae's paper reporting his study, the result of many dedicated days in the field, and to record our thanks to Jack Mackinder, Editor of the Auckland Botanical Society Journal for his courtesy in allowing us to reprint it.

The aims of the Journal

The Group's regular publication should first and foremost be a forum for news

and views on native orchids, from and to the members. A most important part is the sharing of observations among orchid enthusiasts, We need your input

: if you have anything to tell us or to show us and- if you can write or draw - please do so, and send the result to the editor.

Notes

¶ W.F. Liddy writes, "At last I've got around to listing a few orchids I've seen in my rambling around the area and outside it.

"(Ecological District 10) Thames - Kauaeranga *Orthoceras novae-zeelandiae* (very dark and common), *Bulbophyllum pygmaeum*, *Dendrobium cunninghamii*.

"(E.D. 22) Mohaka - Putere *Drymoanthus adversus* (a plant recovered from land clearing operations by a friend and given to me. He stated that it was growing just above goat grazing level).

"(E.D. 29) Tutira area *Thelymitra longifolia*, *Earina autumnalis*, *E. mucronata*, *Microtis unifolia*. Puketitiri

- Blackburn Range (2900ft) *T. longifolia*, *Prasophyllum colensoi*, *M. unifolia*, *Pterostylis graminea* (including several with double flowers), *O. novae-zeelandiae* (green form). Blowhard - Castle Rock (1000-1500ft) *T. longifolia*, *T. hatchii* (in one area of about five acres both were thick - about every two feet), *Corybas macranthus*, *Pterostylis banksii*, *O. novae-zeelandiae* (green), *M. unifolia*, *E. mucronata*.

"(E.D. 36) Rimutaka - Waiohini Gorge *M. unifolia*, *E. mucronata*, *E. autumnalis*, *D. cunninghamii* (these were found on the Rimutaka Range

and Waiohini Gorge. One was pale - almost pure white, while the other had a red-tinged lip), *T. longifolia*.

"(ED. 33) Mt Bruce - Eketahuna area *D. cunninghamii*, *E. autumnalis*, *E. mucronata*, *T. longifolia*.

"(ED. 28) Norsewood - Anzac Park *Earina mucronata*.

"(E.D. 22) southern end Tangoio area *Acianthus sinclairii*, *Cyrtostylis reniformis*, *Corybas oblongus*, *C. macranthus*, *C. trilobus*, *T. longifolia*, *Pterostylis trullifolia*, *P. alobula*, *P. banksii*, *M. unifolia*, *E. mucronata*. In this area I found *M. unifolia* growing on punga trees in moss within six inches of each other, four to five feet above ground level. I also found one group of *M. unifolia* which would grow year after year to about 3ft 6in tall."

Stella and John Rowe report *Gastrodia* "long column" from near Lake Hawea (E.D. 66) - about 28 individual stems, one or two still in flower on 16 February 1990. The tallest stem had 60 flowers; montane habitat, forested in beech, with rotting logs on the ground. *Interesting - I saw a Gastrodia in full bloom several years ago at some altitude above the Copies Valley in March. I did not examine its column at the time, but in retrospect realised it was much too late to have been G. cunninghamii, commonly in flower*

much earlier in the Southern Lakes area - Ed.

¶ Dan Hatch tells us the origin of the name *Caleana*:

George Caley 1770-1829;

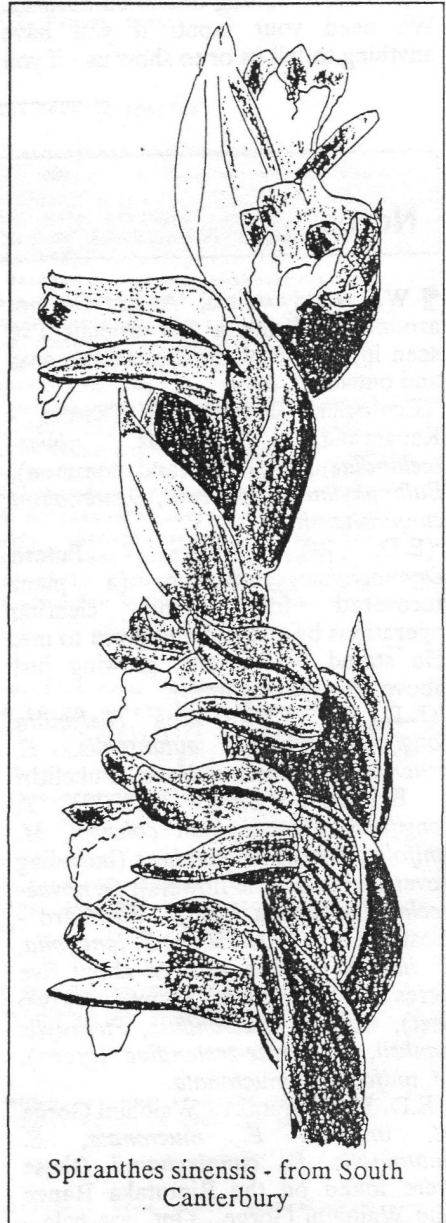
Worked at Kew, whence he was sent to Australia as a botanical collector. He became superintendent of the Paramatta Gardens and in 1802 met Robert Brown, with whom he made several botanical forays into the bush. Recalled to Kew in 1808, he was sent to the West Indies, retiring eventually to England.

While in New South Wales Caley made a collection of Australian animals, birds and reptiles, which was purchased in 1818 by the Linnean Society of London.

In the *Prodromus* 1810 p329, Brown described the genus *Caleana* -

"This beautiful and very distinct genus is named in honour of George Caley, an experienced and accurate botanist, who for many years, under the patronage and at the expence of Sir Joseph Banks, investigated the flora of New South Wales, finding many new plants, and others not entirely unknown to us, but in this small book (the *Prodromus*) incompletely described".

¶ Val Smith writes (6 June) from New Plymouth: "After several years of searching, enquiring and following up a few leads, at last I have located and seen a colony of *Spiranthes sinensis* in Taranaki - thanks to information received at a Forest and Bird meeting. "The group of plants are growing



Spiranthes sinensis - from South
Canterbury

near the side and top of a shallow drain in pasture on the outskirts of Stratford. There were only two plants still flowering when I saw them on 6 February, and I was told they were at their peak about ten days previously when about 208 plants were counted. This was more than had appeared in other years, but like me, the owner fears that their days may be numbered due to draining, grazing, fertilising etc. She doesn't know of any other colonies around, and would like to know of how best to protect them. She fears that if some were fenced off, although protected from grazing, they may get smothered by other growth. An enthusiastic native orchid relative has taken one clump to try to get it established on a suitable site on his property. Do you have any suggestions?"

*(The plight of locally rare plants such as the *Spiranthes* colony in Taranaki is an important issue, involving not the conservation of wild areas, but the concept of management of already modified habitats. In England local management groups (botanists, soil experts, naturalists, farm advisors with an interest in conservation get alongside farmers to advise them on how they may preserve their valuable orchid asset with appropriate modification of fertilising drainage, timing of grazing and cropping their pasture, and pest control. Some of the best New Zealand terrestrial orchid habitat is good because it has been "modified" by man, and such an approach seems sensible here. The Taranaki *Spiranthes* colony could serve as a model - Ed.)*

Val continues: "I was certainly thrilled to see and photograph

Spiranthes at last, and will try to get back to the colony again next year, a little earlier in the season."

Two interesting points to come from an evening speaking and showing my native orchid slides to the Taranaki Orchid Society:

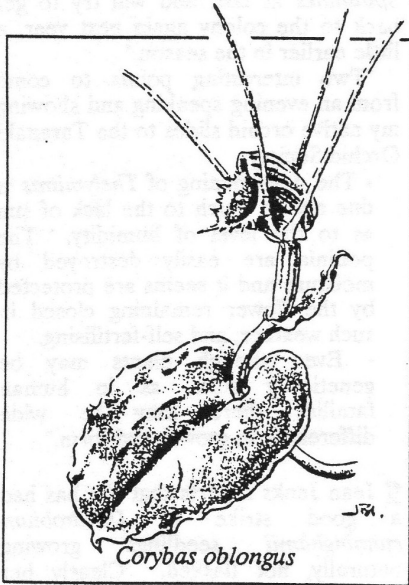
- The non-opening of *Thelymitras* is due not so much to the lack of sun as to the level of humidity. The pollinia are easily destroyed by moisture and it seems are protected by the flower remaining closed in such weather, and self-fertilising.

Even though plants may be genetically alike, as in human families there may be wide differences in growth and form."

¶ Jean Jenks reports that she has had a good strike of *Dendrobium cunninghamii* seedlings growing naturally, not flaked. Clearly her native house conditions are ideal, and next year she will try *Drymoanthus*. She has found *Prasophyllum pumilum* at Baton Saddle (E.D. 47), one plant 52 cm tall.

¶ Ian Rutherford of New Plymouth writes that a lot of interest is being shown in the native orchids in Taranaki, and Ernie Corbett has founded a group of members of the Taranaki Orchid Society, they hope to have more than them in future outings, so if anyone is travelling their way, please contact them (Ian Rutherford, Parate Rd, RD 3; Ernie Corbett, 10 Protea Place, Bell Block; New Plymouth).

On Sunday 24 June, they, George Fuller and John Dodunski "set off for a day in the field. We walked a track on Mt Messenger and viewed many of the



epiphytic orchids, noting a good showing of *Thelymitra* leaf on the

ground. We then went up the Mold Road and to our delight found large colonies of *Pterostylis trullifolia* and these will obviously be flowering for a long while. In fact George took great delight in photographing on one bank a mix of *P. trullifolia* and *Acianthus sinclairii* which were growing well and flowering alongside each other. Only within a few feet of these was *Corybas oblongus*, much of which showed bud development.

"We will certainly look forward to visiting the area again in the spring as there are signs of more species. Half way up one of the roadside banks there was also a nice clump of *Dendrobium cunninghamii* and also within a few feet was *Earina autumnalis*, both growing just on the bank face."

¶Mark Clements divulges in his Catalogue that there is a specimen of *Lyperanthus nigricans* collected in NZ by W.T.L. Travers (1819-1903) in Vienna - does anyone know more?

¶The following article is copied from *World Wildlife News* No. 65, May/June 1990 - thanks to Barbara Ledger of Waikanae for drawing our attention to it.

Belgians curb illegal orchid trafficking

by Lindsey Allan

Marking the climax of a far-reaching investigation, Hans Hermans, a plant merchant who

for years has been under suspicion as one of the mainstays of the international orchid trafficking network, was arrested in Belgium on March 20, 1990. At the time of his arrest, Mr Hermans, known by illegal traffic

monitoring organizations as one of the European “Godfathers” of the orchid trade, was found in possession of 25 orchids from Madagascar. This was allegedly a sample of a much larger shipment of 4,000 wild orchids which was illegally imported from Madagascar into Germany a few days earlier. International trade in all orchid species is subject to the issuance of special documents, in accordance with the regulations of the Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES). The 25 orchids were confiscated since Mr Hermans had not applied for such documents. Mr Hermans has allegedly sold tens of thousands of wild plants, most of them illegally taken from the wild, principally in Asia and Latin America. In order to sidestep international rules and regulations, he shipped the plants in plain postal packages, declared wild collected orchids as ‘hybrids’ or ‘propagated plants’, and used fraudulent documents. The Malaysian government has declared Mr Hermans persona non grata because he is suspected of having been involved in stripping Borneo’s Kinabalu National Park of virtually all its *Paphiopedilum rothschildianum*, Rothschild’s slipper orchid. This is the only place where the species is known to grow. He is also suspected of being heavily involved in smuggling *Paphiopedilum armeniacum*, Chinese yellow slipper orchid a species only discovered in 1982, from China through Hong Kong to the west.

His arrest marks the climax of a

far-reaching investigation into the illicit traffic in wild orchids.

Known as “Operation Nero Wolfe”, the investigation began last year when Belgian custom officers at Brussels National Airport confiscated wild orchids airmailed from Thailand. In February of this year, well over 1,000 orchids were seized, most of which had been imported illegally. In six following searches, Belgian authorities seized another 700 to 800 wild orchids from collections all over the country.

TRAFFIC-Belgium, WWF’s wildlife trade monitoring arm, contributed to this investigation by putting all its expertise at the disposal of the Belgian authorities. TRAFFIC- Belgium has participated in numerous CITES training seminars for Custom Inspection Service officers and was very helpful in drawing the attention of custom officers to the illegal plant trade.

Highly sought-after species such as *Paphiopedilum armeniacum* are worth thousands of dollars to compulsive collectors. The rarer the species, the more fiercely it is coveted. (See *WWF News* no. 61). Poaching of orchids can have grave consequences not only for the plants themselves but also for their environment. For example, in order to pick certain types of plants, the tree on which it grows must also be damaged.

Tom de Meulenaer, Director of TRAFFIC-Belgium says, “WWF and TRAFFIC are delighted at the success of this investigation; after all it is only through international action that illicit traffic of this sort can be eradicated.”

However, Mr Hermans was re- leased an bail and has now disappeared.

Native Orchid Weekend 1990.

The Taupo Orchid Society is planning to host its 8th annual native orchid field days on the weekend of 8 and 9 December. The objective this year will be to have a working weekend transplanting colonies of native orchids from areas of the pine forest into selected areas of the Taupo Botanical Gardens. Trailers from local members will be used to move the plants. To make the best use of the time available we are arranging the use of the Iwitahi Outdoor Education Camp as a base from which to work and for accommodation (i.e. a live in weekend camp). There will be plenty of time for exploration into the wider areas of the pine forest for those wishing to examine the eastern *Pinus nigra* blocks. These have only been looked at briefly so far and parts of them are
already being felled.

The cost of the one night's accommodation, camp fee and BBQ on the Saturday evening will be about \$12 per adult and \$10 per school aged child. Accommodation for the Friday night would be an additional \$10 per person and provide your own evening meal. Tea and coffee will be provided. You will need your own breakfast and lunch, plates cups and cutlery. Also your own sleeping bag, towels etc. Cabins sleep four and are equipped with bunks and mattresses (and the occasional possum I've been told!)

The last time we did this proved very enjoyable with lots of time available for informal discussions. At this stage we would like to keep the proceedings as informal as possible but will need to get some ideas of numbers likely to attend.

For further information and notification of your intention to come please contact Max Gibbs (074) 85024, 15 Rahui Street, Taupo. A live in weekend is also being planned for 10 and 11 November with the Vintage Car Club. This is at the time when the *Corybas* species are in flower. Anyone interested in joining that weekend should also contact Max Gibbs as above.

Australian notes

¶ Two new Groups affiliated with the Australasian Native Orchid Society are in Mackay, Queensland, and Campbelltown, New South Wales.

¶ The Society's Patron, Herman G. Slade, was awarded the Australia ^ Medal in the Australia Day honours, recognising the great contribution he has made to Australian horticulture.

¶ The ANOS Victorian Group (POB 285, Cheltenham, Vic 3192) has three souvenir spoons depicting *Thelymitra ixioides*, *Diuris corymbosa*, and *Sarcophilus falcatus* - AS4.95 apiece, 25% off for twelve or more.

¶ The Second ANOS Autumn Show hosted by the Central Coast Group attracted 800 visitors and was-judged a great success. I

¶ Forthcoming shows include that of the ANOS Warringah Group (8-9 Sept), Port Hacking Group (9 Sept), ; Sydney Group (15-16 Sept), Darling

Downs Orchid Assoc. (22-29 Sept), Victorian Group (6-7 Oct). And of course the **First Australasian Native Orchid Conference and Show** 27-30 September (write to Anna Rousch, Wollongong Uniadvice Ltd, University of Wollongong, POB 1144, NSW 2500). Entries are still welcome for the art and photography sections (contact Dr Andree Millar, 2.21 Windeyer St, Thirlmere, NSW 2572 - as soon as possible).

¶ *Thelymitra matthewsii* has been seen in five areas around Anglesea, though what was once considered the main area for the species has not had plants since the Ash Wednesday fires. The Geelong Group of ANOS have 120 species of wild orchids within 45km of the city. They "consider themselves fortunate" in having so many (ANOS Victorian Group *Bulletin*, 1990. Vol 23: 2). One can only agree.

Mapping

The New Zealand Native Orchid Group's Mapping Scheme is

The following map shows Ecological

Districts shaded for reports so far received of *Corybas trilobus* from the North Island. Does its absence in the east coast Districts reflect its true distribution, or simply the lack of full reports from these Districts?

Ecological District

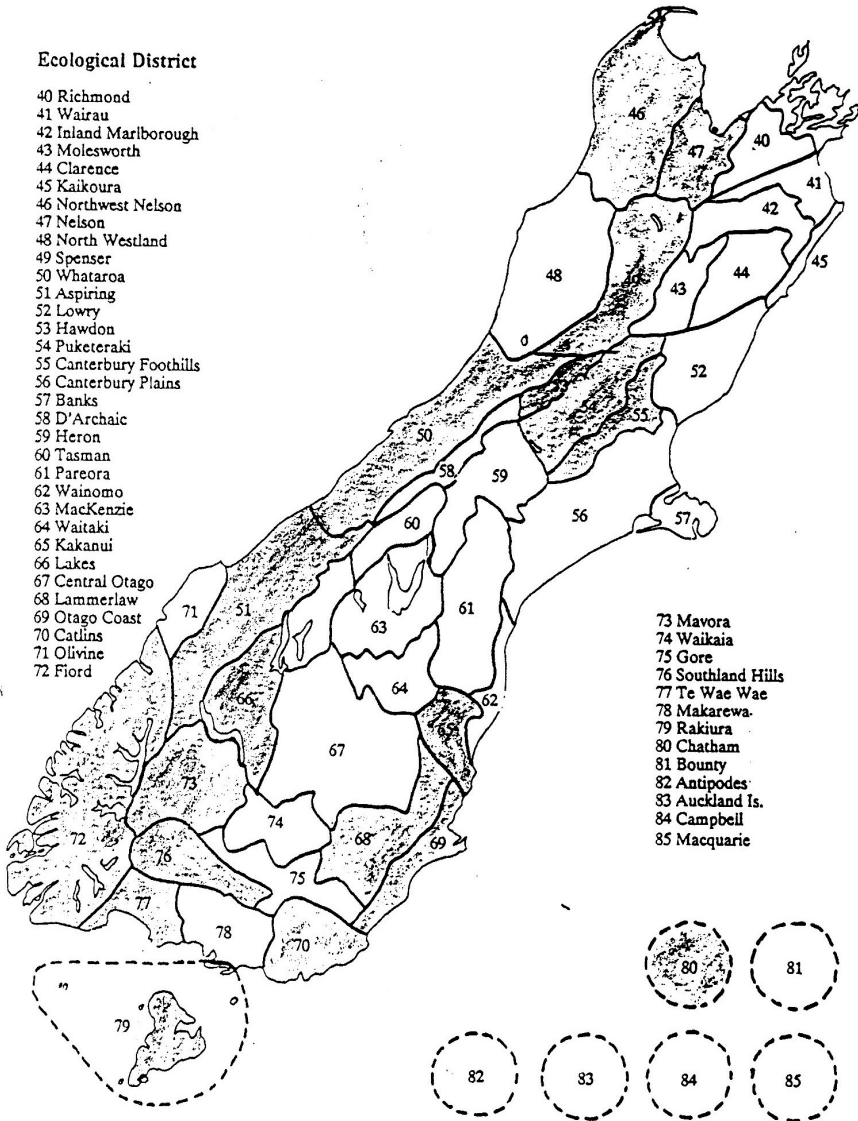
- 1 Kermadec
- 2 Three Kings
- 3 Te Pahi
- 4 Aupouri
- 5 Hokianaga
- 6 Eastern Northland
- 7 Poor Knights
- 8 Kaipara
- 9 Auckland
- 10 Coromandel
- 11 Waikato
- 12 Tainui
- 13 Northern Volcanic Plateau
- 14 Whakatane
- 15 Western Volcanic Plateau
- 16 Central Volcanic Plateau
- 17 Eastern Volcanic Plateau
- 18 Tongariro
- 19 Raukumara
- 20 East Cape
- 21 Urawera
- 22 Wairoa
- 23 King Country
- 24 Taranaki
- 25 Egmont
- 26 Maowhango
- 27 Kaimanawa
- 28 Ruahine
- 29 Hawke's Bay
- 30 Rangitikei
- 31 Manawatu
- 32 Manawatu Gorge
- 33 Pahiatua
- 34 Eastern Hawke's Bay
- 35 Eastern Wairarapa
- 36 Wairarapa
- 37 Aorangi
- 38 Tararua
- 39 Sounds-Wellington



Ecological District

- 40 Richmond
- 41 Wairau
- 42 Inland Marlborough
- 43 Molesworth
- 44 Clarence
- 45 Kaikoura
- 46 Northwest Nelson
- 47 Nelson
- 48 North Westland
- 49 Spenser
- 50 Whataroa
- 51 Aspiring
- 52 Lowry
- 53 Hawdon
- 54 Puketeraki
- 55 Canterbury Foothills
- 56 Canterbury Plains
- 57 Banks
- 58 D'Archaic
- 59 Heron
- 60 Tasman
- 61 Pareora
- 62 Wainomo
- 63 MacKenzie
- 64 Waitaki
- 65 Kakanui
- 66 Lakes
- 67 Central Otago
- 68 Lammerlaw
- 69 Otago Coast
- 70 Catlins
- 71 Olivine
- 72 Fiord

- 73 Mavora
- 74 Waikaia
- 75 Gore
- 76 Southland Hills
- 77 Te Wae Wae
- 78 Makarewa
- 79 Rakiura
- 80 Chatham
- 81 Bounty
- 82 Antipodes
- 83 Auckland Is.
- 84 Campbell
- 85 Macquarie



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New book! Available NOW!

■

The New Zealand orchids: natural history and cultivation

■

edited by Ian St George and Doug McCrae

■

This new, high quality publication on the New Zealand orchids contains chapters on cultivation, propagation, structure, pollination, photography, history, the herbarium, and nomenclature - written by NZNOG members
Chris Ecroyd, Bob Goodger, Dan Hatch, Bruce Irwin,
Doug McCrae, Brian Molloy, Ian St George and Val Smith.

■

29 COLOUR PHOTOGRAPHS, many of rare species

■

Many exquisite drawings by artist Bruce Irwin

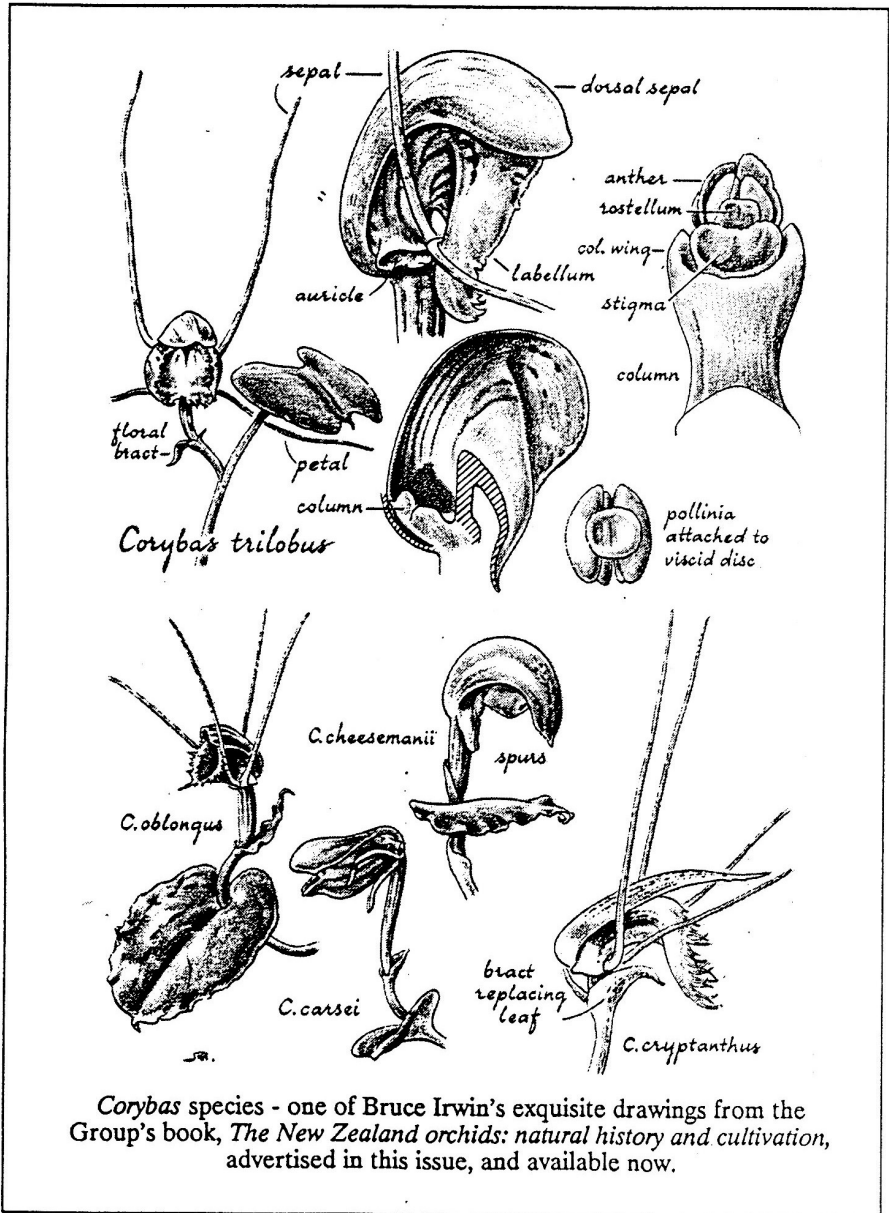
■

This one is a must for anybody interested in the NZ orchids

■

Order your copy at the special reduced price to NZNOG members by completing the order form enclosed with this issue.

■



Corybas species - one of Bruce Irwin's exquisite drawings from the Group's book, *The New Zealand orchids: natural history and cultivation*, advertised in this issue, and available now.

Original papers

Extract on orchids from "Annotated list of vascular plants in the Rotorua Lakes Ecological District"

(reprinted, from *Rotorua Botanical Society Special Issue No. 1, June 1990 - dates seen are added*) by Chris Ecroyd

Acianthus sinclairii (Hook.f.) Hatch (*A. fornicatus* var. *sinclairii*) pixie cap. Recorded from near Lake Rotomahana and at Waimangu.

Aporostylis bifolia (Hook.) Rupp et Hatch odd-leaved orchid. Recorded from Mt Tarawera by Clarkson and Clarkson (1983).

Bulbophyllum pygmaeum (Smith) Lindley bulb-leaf orchid. Found in Tarawera Valley and Lake Rotoiti area as a trunk epiphyte, especially on kamahi.

Caladenia alata R.Br. pink fingers. Occasionally seen in Whakarewarewa Thermal Reserve (1982). •

Caleana minor R.Br. small duck orchid. Only known from one thermal area (1990).

Calochilus paludosus R.Br. brown beards. Scattered plants have been observed around one thermal area (1990).

Calochilus robertsonii Benth. red beards. Found on a few open scrubby areas on poor acid soils (1989).

Chiloglottis cornuta R.Br. green bird orchid. Common under pine forests. Recorded on Mt Tarawera and near Blue Lake (1989).

Corybas macranthus (Hook.f.) Reichb.f. spider orchid. Found Lake

Okataina Scenic Reserve, and on Mokoia Is. Recorded on Mt * Tarawera by Druce and Ogle (1972).

Corybas oblongus (Hooki.) Reichb. spider orchid. Found at Okere Falls, Makatiti Dome, and Lake Rotoiti Scenic Reserve (1983).

Corybas rivularis (Cunn.) Reichb.f. [*C. orbiculatus*] spider orchid. Recorded from Umurua and Lake Rotoiti Scenic Reserves (1984).

Corybas trilobus (Hook.f.) Reichb.f. common spider orchid. Found at Makatiti Dome and Mt Ngongotaha (1984).

Dendrobium cunninghamii Lindley winika. Common epiphyte in native forests and on rocks. It flowers spectacularly in mid-January on rocky bush-clad shores of Mokoia Is.

Drymoanthus adversus (Hook.f.) Dock, green fleshy orchid. Epiphyte on rewarewa and kamahi. Common near Blue Lake, on Mokoia Is and near Lake Rotoehu.

Earina autumnalis (G.Forster) Hook.f. raupeka. Common epiphyte in native forest (1989).

Earina mucronata Lindley. peka-a-waka. Common epiphyte in native forest.

Gastrodia cunninghamii Hook.f. potato orchid Found in the Forest Research Institute grounds under

- exotic conifers with the other two species of *Gastrodia* and in the Lake Okataina Scenic Reserve.
- Gastrodia minor* Petrie, potato orchid. A few plants occur in the Forest Research Institute grounds under exotic conifers with the other two species of *Gastrodia* (1984-1990).
- Gastrodia sesamoides* R.Br. potato orchid. Recorded from Whakarewarewa Forest, Forest Research Institute grounds and Waimangu Valley (1990).
- Microtis oligantha* L.Moore small onion orchid. Collected from Mt Tarawera dometops (after 1982).
- Microtis parviflora* RJ3r. slender onion orchid. Grows on grassy banks in Whakarewarewa Thermal Reserve with *Microtis unifolia*, also at Waimangu (1989).
- Microtis unifolia* (G.Forster) Reichb.f. common onion orchid. Abundant on grassy banks, roadsides and in lawns.
- Orthoceras strictum* R.Br. [*Orthoceras novae-zeelandiae* (A.Rich.) D.Jones, M.Clements et Molloy] mamaika. Occurs on roadside banks and dry scrubby sites at Whakarewarewa.
- Prasophyllum colensoi* Hook.f. common leek orchid. Occurs on Mt Tarawera dometops and roadside banks at Rotoiti.
- Prasophyllum nudum* Hook.f. leek orchid. Recorded on Mt Tarawera and collected near Rotorua by K.W.Allison in 1932.
- Prasophyllum* sp. (aff. *P. patens* R.Br.) broad-lip leek orchid. Collected from Rotorua by H.B.Matthews in January 1923.
- Pterostylis alobula* (Hatch) L.Moore greenhood. Collected from near Lake Rotoiti (1984).
- Pterostylis banksii* Cunn. common greenhood. Found at Okere Falls, Makatiti Dome, Mt Ngongotaha, Whakarewarewa Forest, and Lake Okataina Scenic Reserve.
- Pterostylis cardiostigma* D.Cooper. Greenhood. One patch found in tawa rest in the headwaters of the Utuhina Stream (1989).
- Pterostylis foliata* Hook.f. slender greenhood. Collected near Rotorua FA.Springhall in November 1946.
- Pterostylis graminea* Hook.f. greenhood. Recorded from Hinehopu Mire by J.B.Irwin.
- Pterostylis plumosa* Cady [*P. barbata*] bearded greenhood. Recorded from Rotorua by White (1958).
- Pterostylis trullifolia* Hook.f. greenhood. Found at Okere Falls, above the steaming cliffs near Lake Rotomahana, and Tarawera River Valley (1989).
- Spiranthes sinensis* (Pers.) Ames, ladies' tresses. Collected from Hinehopu Mire (1983).
- Thelymitra carnea* R.Br. tiny sun orchid. Recorded from Pohaturoa Dome, and Whakarewarewa thermal area.
- Thelymitra formosa* Colenso. sun orchid. Collected from Hinehopu Mire (1984).
- Thelymitra longifolia* Forster et G.Forster. common sun orchid. Common on pumice banks and roadsides.
- Thelymitra pauciflora* R.Br. slender sun orchid. Fairly common in open scrub.
- Thelymitra pulchella* Hook.f. maika. Hatch (1952) records it as "common about Rotorua". Also found by Kirk (1873) but there are no recent records.

Thelymitra venosa R.Br. [*Thelymitra yanea* (Lindley) Benth.] striped sun

orchid. Collected from Ohinemutu by TF. Cheeseman in 1887. There are no recent records.

A request for observations on *Corybas*

by Bruce Irwin

Can you please help me determine the status and distribution of *Corybas* forms within the *C. macranthus*/*C. rivularis* group?

Dripping roadside banks and cuttings

provide a quick convenient way to check *Corybas* species within a hilly area. In less hilly areas *Corybas* may be found on shaded moss-covered stream banks.

KEY to species	Flowers below obviously stalked leaf	Dorsal sepal narrow, <1/3 lip width	Lateral sepals MUCH longer than petals	Petals & sepals barely longer than lip	Labellum (lip) often flecked red
<i>C. macranthus</i>	x	x			
<i>C. rivularis</i>			x		
<i>C. species "A"</i>					x
<i>C. species "C"</i>				x	

Distribution and flowering times

of the two unnamed species are my main objectives, but it is also important to record data on *C. macranthus* and *C. rivularis* (previously *C. orbiculatus*) from which they may have evolved. Flowering may be from September to January with *C. rivularis* posing a puzzle because it flowers during September in Taranaki but not until October in the Bay of Plenty, and not until November in Northland.

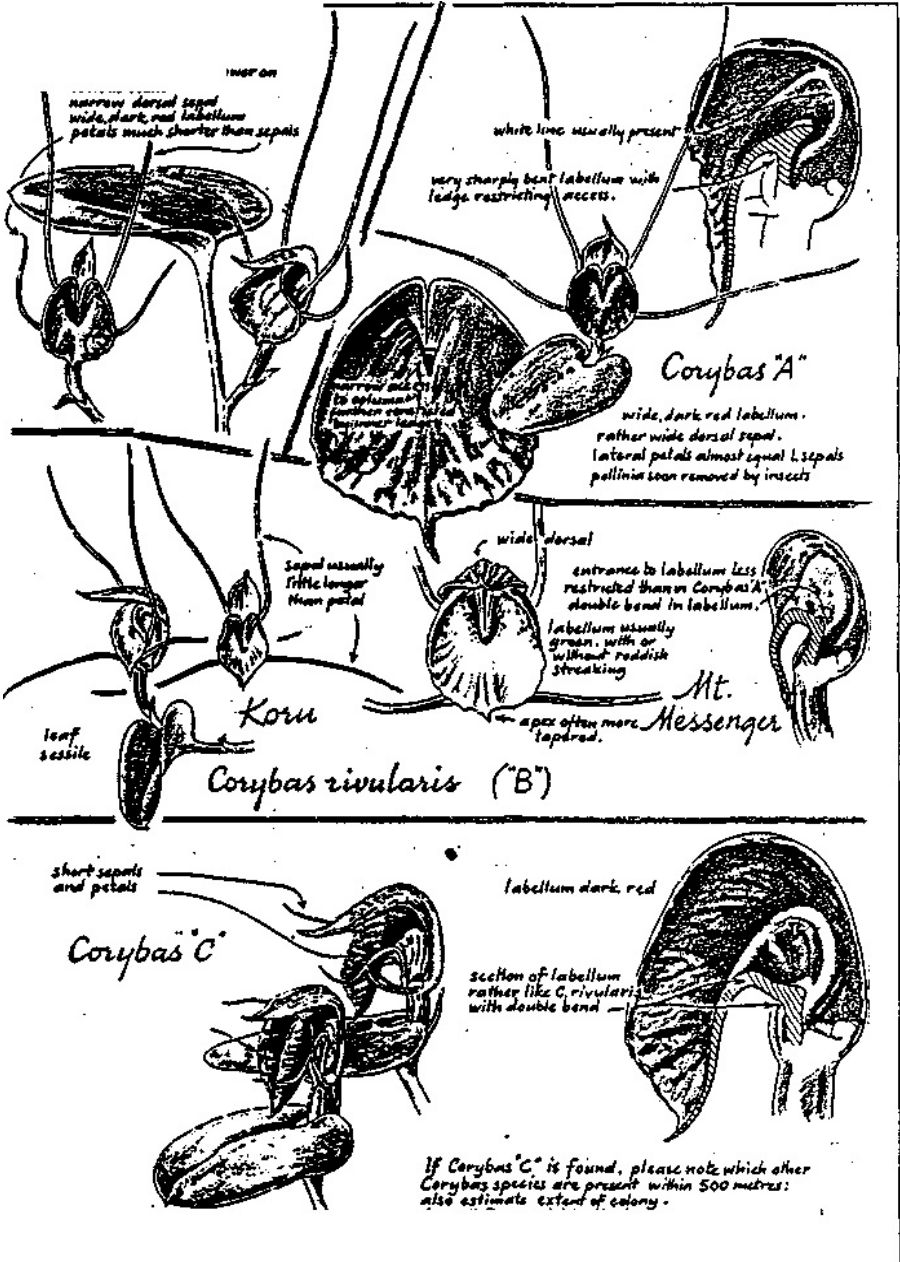
Possible hybrids. It is important to record which species grow together and whether hybrids are suspected. It is quite possible that further

unnamed species exist.

Abundance or rarity of each species should be noted.

Maps. If possible record the various forms on a map (or an outline tracing of one) on which latitude and longitude are shown.

Identification. If you are unable to determine, any form, I shall try to identify it, if you send a flower only sealed in a plastic bag or similar, with damp moss or damp but not wet paper. If the form is present in small numbers send only photographs and description. If the locality is easily identified I may wish to visit the site next season.



Caladenia lyallii - observations and thoughts.

by Max Gibbs, Taupo

Towards the end of November 1989 I came across areas at Iwitahi with large populations of white-flowered orchids which I identified as *Caladenia lyallii* from the hairy, strap-like leaf, hairy stem and the general shape and attitude of the flower. The usual habitat for these orchids is flat, medium to low light areas of thick pine needles without the ferns and other competing plants. Between the trunks of the pine trees the well spaced solitary white flowers could be seen in all directions. Nothing unusual in that. However, dotted through these areas individual flowers stood out as whiter or brighter than the rest. I really didn't take much notice.

On one visit I was trying out a new lens, a 200mm Medical Nikor which I had adapted to fit my Olympus OM 2n camera for ultra close-ups. I was looking for the different forms of *Corybas trilobus* and decided to finish the film up on the *Caladenias*.

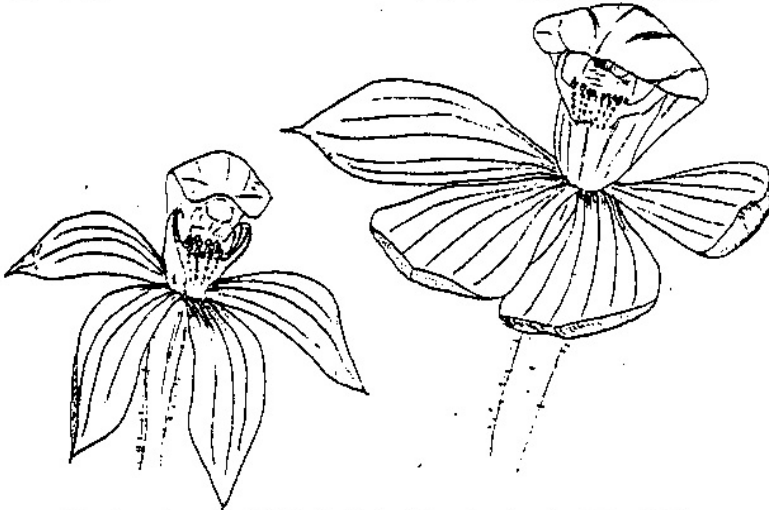
I selected, naturally, the brightest flowers to photograph and would have disregarded the others if one of these had not been growing close to the flower I was photographing. It too was fully open but looked somehow different although definitely fitting the description of *Caladenia lyallii*. I photographed both and went home.

On examining the photos, the difference became obvious. The brighter flower had much wider petals and lateral sepals than the other, and these were spread almost flat giving

the flower the extra brilliance which caught my eye. Each petal and sepal had five distinct longitudinal veins. In comparison, the less bright flower had only three distinct veins, and the petals and sepals were curved. The other major difference was the number of rows of calli on the labellum. The less bright flower had the four rows of calli characteristic of *C. lyallii*, but the brighter flower had more than four rows and from the photos would appear to have six. The brighter flowered plant had a wider and longer leaf and longer stem of. The less bright flower was more common and probably accounted for more than 80% of the *Caladenia lyallii* plants seen.

The overall appearance of the two flowers was as if one were looking at diploid (2N) and tetraploid (4N) *Cymbidium* flowers of the same species side by side. I will complete the observations this year. The two forms might just be a local variation within the species, but if it occurs elsewhere perhaps it is a species which has been overlooked.

Editor's note: I have seen a similar large plant near Dunedin, on Swampy; it was 30cm tall with a 2cm broad leaf, and a flower of 4cm diameter. Its labellum bore



The two forms of *Caladenia lyallii* - drawing by Max Gibbs

***Thelymitra tholiformis* Molloy et Hatch - a new species of sun orchid endemic to New Zealand**

by Brian Molloy and Dan Hatch

In a recent paper published in the *New Zealand Journal of Botany* (1990, Volume 28: ppl05-114) we have described a new species of the sun orchid *Thelymitra tholiformis*. The name *tholiformis*, dome-shaped, refers to the form of the post-anther lobe of this distinctive orchid. This species had been previously misidentified as *T. intermedia* Berggren and *T. aemula* Cheeseman. The latter in turn had been confused with *T. ixioides* Sw. In our paper we have discussed at length, in chronological

sequence, the sources of this confusion, and drawn several conclusions.

To summarise, we regard *T. aemula* as distinct from *T. ixioides* and other New Zealand species of *Thelymitra*, and have reinstated it. On the other hand, in our opinion, the characters of the type material on which Berggren's name *T. intermedia* was based, are identical to those of the species known in New Zealand as *T. pauciflora* R.Br. Thus, we have relegated *T. intermedia*

to synonymy under the earlier name *T. pauciflora*. This left the species misidentified as *T. intermedia* or *T. aemula* in earlier treatments without a name. This species we have described as *T. tholiformis*.

To help readers to identify and distinguish *T. tholiformis*, *T. aemula* and *T. ixioides* we have reproduced here Figure 1 (beautifully drawn by Bruce Irwin) and Table 1 from our paper with the permission of the New Zealand Journal of Botany. For further information readers are referred to this paper in the Volume cited above.

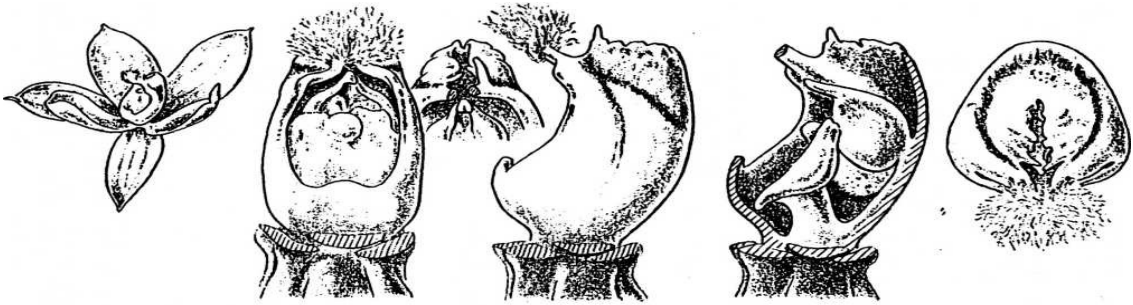
Thelymitra tholiformis and *T. aemula* are uncommon northern orchids confined to the "kauri zone" as far as

we know. On the other hand, *T. ixioides* is more widespread though also not common. Its exact southern limits are not known, but it has been seen at least as far south as the Canterbury foothills. Readers are invited to contribute additional sightings of these three species to this journal, together with any field notes, however trivial they may seem. Any variations of the characters listed in Table 1 should be noted and written up for the journal as well, or sent to the authors.

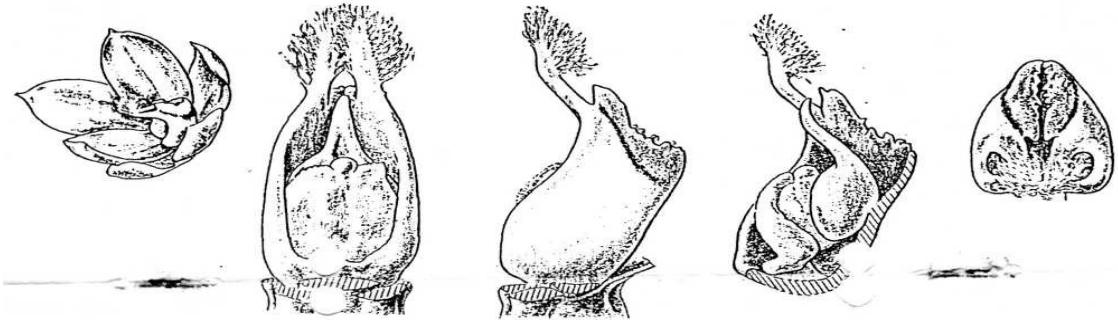
Acknowledgement: We are grateful to Dr Carol West, *New Zealand Journal of Botany*, for permission to reproduce Figure 1 and Table 1.

Table 1 Comparison of *Thelymitra tholiformis*, *T. aemula* and New Zealand forms of *T. ixioides*

	<i>T. tholiformis</i>	<i>T. aemula</i>	<i>T. ixioides</i>
Growth habit	Solitary or grouped usually slender plants to 40cm	Solitary slender to <i>very robust plants</i> to 70cm	Solitary <i>very slender plants</i> to 50cm
Leaf	Narrow-linear strap-like concave ridged green with reddish margins and base	Linear <i>thick strongly ridged</i> dark green with reddish base	Very narrow blunt concave or rounded finely ridged <i>reddish green with whitish retrorse papillae</i>
Stem	<i>Slender blue-green</i> bracts 2 rarely 3 narrow clasping	<i>Robust reddish-green</i> bracts 2-3 <i>stout, tips divergent</i>	<i>Very slender red-green</i> bracts 2 rarely 3 narrow clasping
Flowers	1-8 (max. 15) buds and ovary slender	3-10 (max 22) buds and ovary robust	1-5 (max 10) buds and ovary slender
Perianth	Pale to strong mauve plain	Pale mauve to blue plain	Pale mauve to blue <i>usually with darker spots</i>
Column	Pale purple with yellow striae purple band near top	White to mauve flushed darker mauve band near top	Pale to darker mauve or violet band near top
Post-anther lobe	<i>Tall dome-shaped</i> yellow margin denticulate slightly recurved horned	Erect not hooded yellow margin denticulate <i>slightly</i> recurved	Erect not hooded purple or <i>reddish-yellow finger-like calli</i>



T. tholiformis



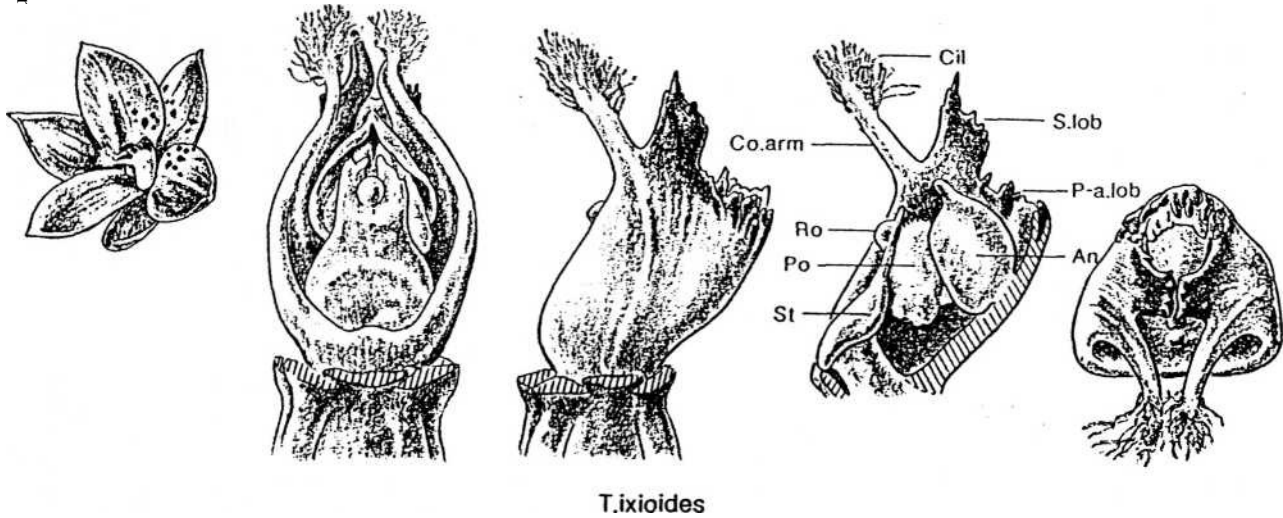


Fig. 1 Comparative drawings of flowers and columns (front, side, cutaway, vertical views) of *Thelymilia tholiformis*, *T. aemula*, and *T. ixioides* N.Z. An = anther; Cil=cilia; Co. arm=column arm; P-a. lob=post-anther lobe; Po = pollinia; Ro = rostellum; S. lob = side lobule; St = stigma.

Molloy and Hatch - Table 1 continued

	<i>T. tholiformis</i>	<i>r. aemula</i>	<i>T. ixioides</i>
Side lobe	<i>Absent</i>	<i>Low forward-pointing fleshy yellow</i>	<i>High erect fleshy jagged purple or reddish-yellow</i>
Column arms	<i>Rounded erect tips</i>	Flattened laterally erect or horizontal	<i>Flattened laterally horizontal</i>
Hair tufts	<i>Globose dense white</i>	<i>Brush-like thin white</i>	<i>Brush-like sparse white or mauve</i>
Stigma	<i>Short broad rostellum large</i>	Short broad rostellum small	<i>Tall narrowed rostellum small sunken</i>
Anther apex	Short-pointed visible	<i>Long-pointed very prominent</i>	Short-pointed visible
Pollen	Monad	Monad	Tetrad
Chromosome number	2n = 66	2n = 40	2/t = 28
Distribution	North Cape to Auckland	North Cape to Tauranga	Northland to at least Canterbury

Observations on *Corybas cheesemanii*

Ken Wilson, Dan Hatch, Max Gibbs

¶ Ken Wilson writes (19 June): "We spent some time with Dan Hatch on Sunday last. We had found a couple of small colonies of *Corybas cheesemanii* of the white and pale green form (in the Waitakeres). Albinos I suppose, with almost no leaf to speak of.... We assume it must be due to some form of malnutrition or deficiency, although the colonies, in the second year of observation, do seem quite vigorous. Within a few yards of them are perfectly normally coloured plants close in to kanuka trees. Dan is sure there is an affinity."

¶ Dan Hatch writes (3 July): "White-flowered forms of *Corybas oblongus* were recorded by Diane Duder, from Duder's Bush in the Hunua Ranges on 16 October 1977; and of *C. cheesemanii* from Mongonui in the far north by Doug McCrae in September 1986. I have photos from both these localities. The recent discovery by Mrs Cath Wilson of several colonies of white-flowered *C. cheesemanii* at Huia, in the southern Waitakere Ranges, enabled me to examine the plants in situ. The "white" colouring would appear to be due to the absence of the red pigment - the flowers are

colourless rather than white, but since the sepals and often the petals carry chloroplasts, these "white" flowers are usually strongly tinged with green. *Corybas cheesemanii* normally grows among fairly deep kanuka twig debris, but the Huia colonies were on a bare and eroding trackside bank. Several of the rhizomes were lying on the surface, had developed chloroplasts and were green. The white-flowered plants were in good condition, with large flowers and normal leaves. Several flowers had been fertilised and were forming seed capsules. A number of normally-coloured flowers were scattered among the "white"-flowered forms. Two normally-flowered colonies were found nearby, a little off the track, in their usual twig-debris habitat.

¶ *The "white" form of C. cheesemanii is*

illustrated in the Group's new book, "The New Zealand orchids: natural history and cultivation", as is a "white" form of C. trilobus, photographed by Max Gibbs - Ed.

¶ Max Gibbs writes (20 June): "Further on Iwitahi - the areas found last winter with *Corybas cheesemanii* have been completely logged and no 0 orchids survived. After two weekends of searching found two small patches (about 10m²) of *C. cheesemanii* and that's it! These are also in the path of current logging so have been carefully marked and will be recovered completely. Other patches probably exist but are very difficult to find - and finding them is dangerous as hunters were shooting in the area where these were found - me with a brown jersey and hat! on hands and knees!"

Historical reprints

Corysanthes cheesemani

(from J.D. Hooker's *Icones Plantarum*, or Figures, with Descriptive Characters and Remarks, of New and Rare Plants selected from the Kew Herbarium. 1881? Vol II (Vol XII of the entire work) pp 19-20, 1120 - drawing and lithography by W.H. Fitch).

C. Cheesemani, Hook, f.; folio sessili cordato-orbiculari apiculato, flore subsessili, pedunculo post antbesin elongato, ovario bractea spathacea vagiato, sepalo dorsali 'galeato obtuso, lateralibus setaceis minutis labello suppositis v. obsolete, petalis lateralibus setaceis v. 0, labello tubuloso coloranam araplectente, ore ampliato recurvo 2-lobo, lobis retlexia subintegris, marginibus basi utriusque in auriculam dellexam obtusam productis.

HAB. New Zealand, amongst bushes at Purewa, near Auckland, F. F. Cheeseman, Esq.

This curious little species was first brought to my notice in 1867 by P. F. Cheeseman, Esq., of Auckland, a very acute botanist, to whom I am indebted for several other interesting discoveries in the Northern Island, and notably the beautiful little *Hymenophyllum Cheesemanii* (Baker, mss.), of which a figure is prepared for this work.

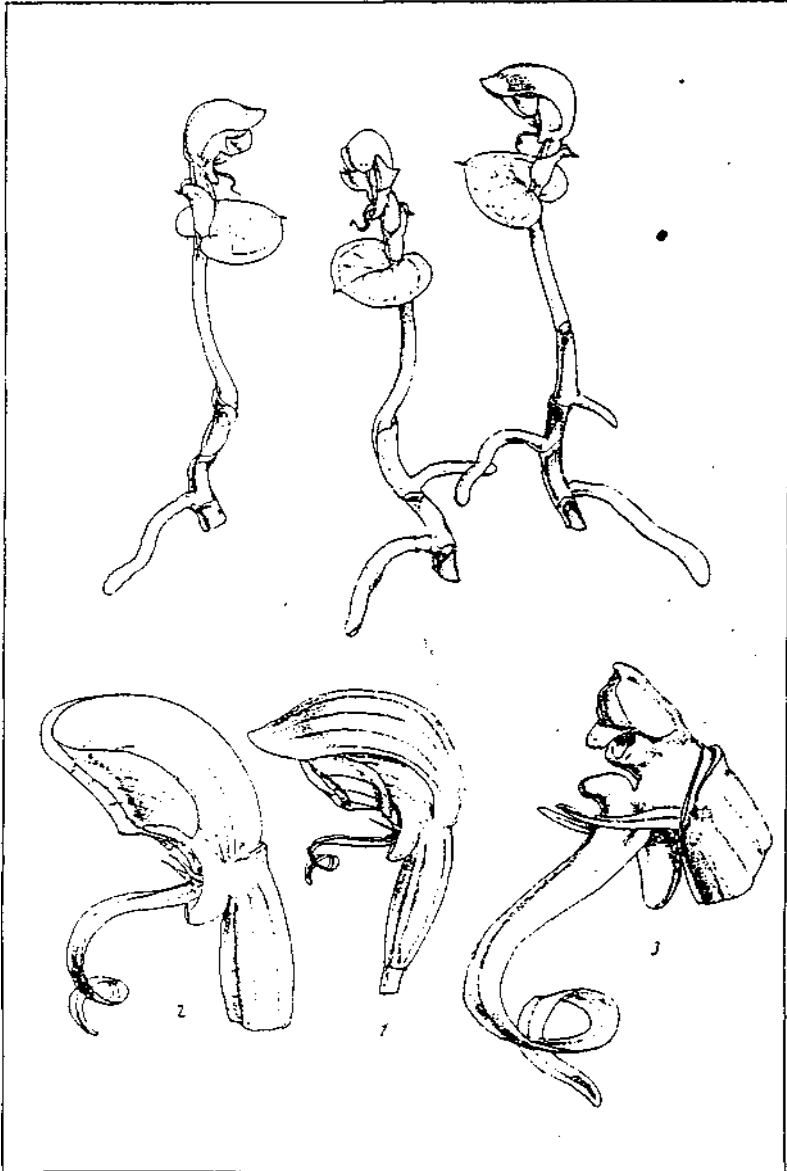
Corysanthes was found at Purewa, about five miles from Auckland, flowering in June and July, in a dense bush, principally composed of *Myrsine Urvillei*, *Sencio Forsteri*, and *Leptospennum scoparium*, with a thick under-growth of various species of sedges.

Mr. Cheeseman describes the leaves as more membranous than those of any other species known to him, and the flower as did! purple with several greenish stripes and blotches on the surface of the upper sepal; he adds that the margins of the lip meet behind the column and enclose it, that the lateral sepals, when present, are very narrow-linear, placed under the lip and never exceed it, and that the petals, when present, are very minute indeed, subulate, deflexed, and placed under the basal tubes of the lip.

This description does not fully accord with my examination of several specimens, nor do either of them accord with Mr. Fitch's drawing, owing to the extreme difficulty of macerating the flower for the purpose of dissection. Mr. Cheeseman does not describe the curious ligulate, often twisted, process which proceeds in some specimens from the very base of the lip, at its medial line, and which I find to be sometimes replaced by two subulate processes; this is incorrectly represented in the accompanying Plate as a continuation of the base of the column. This muBt either be a process of the base of the lip, or consist of the two lateral sepals,—a view favoured by the fact of its being sometimes replaced by two subulate bodies. The subulate lateral petals I never found in all the specimens which I have examined.

The similarity of this species to Brown's Port Jackson *C. bicalcarata*, is so strong that I suspect that it may prove identical with it. I hesitate however to unite them without further materials, the dorsal sepal being much less arched in the New Zealand plant.

I regret to observe that it is proposed to replace Brown's generic name of *Corysanthes* by Salisbury's somewhat earlier one of *Corybat*, the totally erroneous description of which was (as was well known at the time) drawn up surreptitiously from an inspection of Bauer's figure of the Australian



Corysanthes bicalcarata, when exhibited by Robert Brown at Sir Joseph Banks's rooms, with the latter name attached to it.—J. D. HOOKER

Fig. 1. Flower. 2. The same with the dorsal sepal removed. 3. Column, petals, and lip:—all magnified.

(from J.D. Hooker's *Icones Plantarum*. 1882 Vol III, p 2).

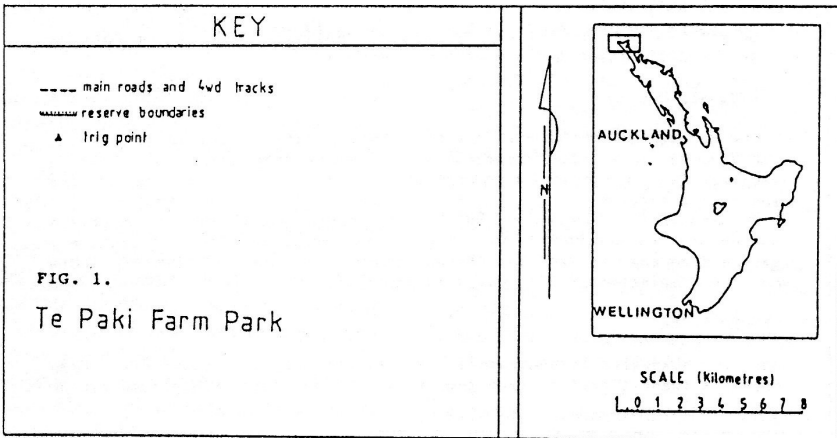
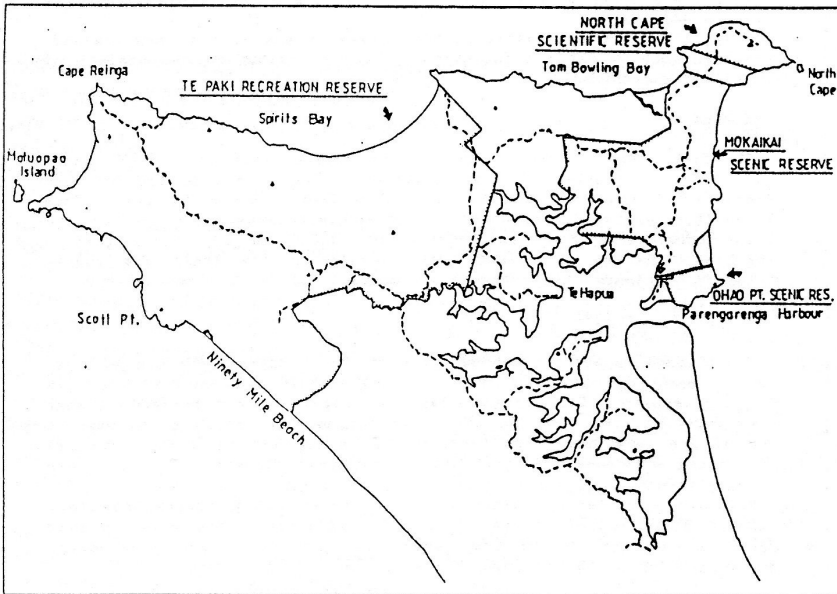
When describing *Corysanthes Cheesemani* (Tab. 1120) I left in doubt certain points of structure, in respect of which I differed from the discoverer of the plant and from the artist whose figure is quoted above. These I am now enabled to clear up by means of specimens in spirits, kindly communicated by Mr. Cheeseman.

In none of these do I find the ligulate process figured, nor anything in its place. The base of the lip is produced downwards on each side of the mesial line into a conical hollow obtuse short spur, between which spurs the two lateral sepals, reduced to subulate ascending processes, are projected as represented in figs. 1 and 2. I find no trace of petals. The lamina of the lip varies much in shape; it appears usually as represented at fig. 1, but sometimes as in fig. 2, and in a few cases it is reduced at the apex, having no reflected portion.

As a species, *C. Cheesemani* is very clearly allied to the Australian *C. fimbriata*, Br., differing chiefly in the spurs of the lip and absence of petals.

A specimen of *C. (Neraetoceras) macrantha*, Hk.f. (Fl. N. Zetjd. 1. 249, t. LVII.; Handbook, p. 266), sent by Mr. Cheeseman with the above, shows that the petals are inserted at the base of the lip at its outer margin, one on each side, apparently on a level with the lateral sepals, which are placed between the petals, that is to say, nearer to the mesial line of the lip. The lip is twisted from the base, so that access to the pollen and stigma is gained from the base of the flower, not as in *Corysanthes Cheesemani*, by the mouth of the lip. If this arrangement is constant, and prevails through the other plants upon which I established the genus *Nemetoceras*, in the New Zealand Flora, it may indicate the propriety of retaining that genus instead of merging it in *Corysanthes*, as I have done in the 'Handbook of The New Zealand Flora.' The whole genus demands an attentive study from the local observer, in respect both of structure and mode of impregnation. —J. D. HOOKER.

A survey of the orchid flora of Te Paki Farm Park
(Reprinted with the permission of the *Auckland Botanical Society Journal*).
by D.P. McCrae



INTRODUCTION

During 1988-89, as part of the Department of Conservation's Te Pahi Farm Park. Flora Survey, I undertook a survey of the orchid flora within the Park boundaries.

This, the first systematic orchid survey of any area in New Zealand, provided much valuable information on the distribution and ecology of Northland's orchids.

THE PARK

The Park, (Fig. 1) which lies at the northernmost tip of the North Island, is a complex of five reserves. These include the Te Pahi Recreational Reserve, Mokaikai and Ohao Scenic Reserves, North Cape Scientific Reserve and Motuopao Island Nature Reserve.

The total area comprises more than 23,000 ha of remote terrain reaching from the sandy and rocky coasts to the steep and rugged volcanic highlands which rise to 300 m a.s.l. at Te Pahi and Unuwhao.

ENVIRONMENTAL FORCES

The climate ranges between sub-tropical and temperate but can be harsh and extreme. Being almost totally surrounded by sea, most of the Park is very exposed. The western coast and highlands are buffeted almost constantly by wind - mainly the prevailing westerlies. At the eastern end of the Park the North Cape massif is exposed to winds from all directions and consequently it has a very harsh climate. Erosion there is very severe.

Rainfall is moderate, with occasional heavy falls. Many steep and exposed hills exhibit areas devoid of vegetation. The Park is also prone to drought during the long, hot summers - and this makes recolonisation of the eroded areas slow.

ACCESS

Other than the Te Pahi and Spirits Bay Roads, access to the Park is restricted mainly to 4wd and off-road vehicles.

SURVEY METHODS

The initial foray (March) was to identify habitat suited to orchids and from this to select representative habitat types in the differing geographical, geological and climatic areas, for revisiting on the subsequent surveys.

Unfortunately, funding by DoC for the remainder of the entire Flora Survey was discontinued after this initial investigation. Fortunately grants from the Ministry for the Environment and the N.Z. Lottery Board enabled completion of the survey during 1989.

ORCHID FLORA

Due to suspected inaccuracies by various earlier observers, some previous identifications required verification. Name changes and recent clarification of entities within some species also

necessitated the re-appraisal of a number of earlier records.

Prior to the beginning of this survey, 27 species had been Identified in the Park. The list has now increased to 41, comprising 27 endemic species and 14 species shared with Australia. 40% of the country's orchid flora is represented.

As would be expected, the sub-tropical climate and the 'dust-trap' effect of the Northland Peninsula combine to produce an orchid flora with a high Australian content. The exposed, disturbed and leached soil types suit Thelymitra which is the genus represented by the largest number of species (10). Corybas (6 species) is the second largest genus recorded. The warm, dry climate and restricted forest cover are not so conducive to Pterostylis - only 5 species were observed, three shrubland and two forest dwellers. Caladenia (3 species) was the other major component of the Park's orchid flora. Most of these and the remainder of the terrestrials are common species in Northland, with a wider distribution throughout the country. ^

The natural forces of climate together with the geology and geography of the area dictate the composition of the orchid flora and, in this respect, the survey produced no real surprises.

The names of taxa used in this paper follow Molloy and Hatch's interim list of orchid names.

SURVEY

In March, the three-week habitat survey uncovered little evidence of the previous season's orchids. Although the more recent botanical accounts indicate a fairly diverse orchid flora, my impression was that many of those recorded must be present only in small numbers.

Seven subsequent visits from July 1988 to December 1989 dispelled that view. The flora proved to be even more diverse than anticipated and only a few species were found to be poorly represented in the Park.

FOREST ORCHIDS

Mokaikai S.R.

Whareana Bush is a coastal remnant in the drier eastern area of the Park. Lying in a small eroded valley, protected at its head and on both sides by steep to sheer rock faces, it contains typical coastal species and associations. Access is by pig-tracks that run near the base of both hillsides from the beach and a drop from the ridge track on the northern flank is possible. Best access to the upper part is via the stream bed. Some agility is required to clamber over the tumble of enormous conglomerate boulders that stretch for some distance downstream. At the head, an impressive waterfall descends the broken rock face, over a lower ledge and then across the open face of a cave. This cave has an interesting Maori history and is well worth venturing into for the sensation of the view from behind the fall.

A result of the dry nature of this remnant is the almost total lack of epiphytic growth (e.g. Collosporum, Astelia) on even the old and large trees. No epiphytic or terrestrial orchids were noted on the March visit.

Hauptototo bush, a semi-coastal remnant is set in an eroded conglomerate gully below the Taumatarao Flat. Run-off from the gumland above descends a 30 metre, two-tiered fall at the head of the Ponaki Stream, a ledge on the second level leads back into a cave, larger than that at Whareana. Cooking stones, shells and ash suggest earlier Maori

occupation. A full day was spent exploring this little-known remnant - the largest in the Mokaikai Reserve. Not a single orchid of any kind was noted during the March visit.

The following day# another south-facing remnant near Poroiki Hill, Parengarenga catchment was investigated. Although quite small, this remnant was much damper than the others visited in the Mokaikai Reserve. Dominant species included taraire (*Beilschmiedia taraire*), puriri (*Vitex lucens*) and rewarewa (*Knightia excelsa*), with much epiphytic growth evident. Three orchid species were sighted. *Dendrobium cunninghamii* was not uncommon in the heads of large rewarewa and puriri. *Bulbophyllum pygmaeum* was not uncommon and one specimen of *Drymoanthus adversus* was noted on rewarewa.

Te Paki R.R.

Again in March# a steep, south-facing clay slope off Darkies Track (near Pandora) was surveyed. Along the forest margins, bordering the kauri (*Agathis australis*) on the valley floor and stream sides, large kanuka (*Kunzea ericoides*) up to 15 m dominate. An unusual sub-dominant species here is the lancewood (*Pseudopanax crassifolius*) which is found in groves of very large specimens reaching up to 15 m. Their trunks occasionally support *Drymoanthus adversus*. Where the kanuka merges with the forest species# *Bulbophyllum pygmaeum* is not uncommon on kauri and rewarewa. *Dendrobium cunninghamii* was also not uncommon in the trunks of rewarewa. The kauri forest itself was not explored.

That botanical cornucopia - Radar Bush# supports the greatest representation of epiphytic and terrestrial forest orchids encountered during the survey. Four separate visits were made (Mar., Jul., Sept., Nov. 1988) with nine terrestrial and four epiphytic species being recorded in the forest proper.

On the northerly slopes near the end of the access track *Bulbophyllum pygmaeum* is not uncommon on the trunks of monoao (*Halocarpus kirkii*) and taraire. *Dendrobium cunninghamii* is not uncommon on the taller taraire bordering the stream and is occasionally found on monoao on the eastern slopes. Only one sighting of *Earina autumnalis* was made during the forest surveys - high in an unidentified tree on the eastern stream bank. On the slope above a few specimens of *Drymoanthus adversus* were found on monoao.

Back on the clay slopes below the access track a number of terrestrial species were observed. *Acianthus sinclairii* (fls. Jul., seed Nov.) is common, as is *Cyrtostylis oblonga* (fls. Jul., seed Sept.-Nov.). This species was# until recently# considered synonymous with *C. reniformis*. *C. oblonga* is predominantly a kauri forest species which rarely turns up in shrubland communities (North Cape, Rangitoto). *C. reniformis* has not been noted in Northland forests# preferring shrubland that is often dry and seemingly inhospitable to orchids.

One small colony of *Corybas trilobus* (ivs. Sept.) was located near the track. The only other *Corybas* sighted was *C. oblongus* (bud Sept., fls. Nov.) which is common on slopes on both sides of the stream and uncommon on the western bank.

Pterostylis trullifolia (seed Nov.) is common in scattered colonies throughout. *Pterostylis graminea* var. *rubricaulis* (fls. Sept., fls. seed Nov.) is not uncommon in its usual habitat - under ricker kauri.

Two species of *Caladenia* were recorded on the slopes below the track - the pink *C. minor* (seed Nov.) and the taller greenish-white *C. "green column"* (seed Nov.). Both were not common there, but the latter was locally more common on the slopes and ridge across the stream.

Numerous other species were recorded on the access track and on the

open ridges along the forest margins. These are included in the heathland orchid section.

Disturbing features of all the remnants surveyed was the severe damage to the forest floor caused by pigs and cattle. The various subspecies of the land snail (Placostylus) are at risk. Large areas in the Mokaikaki remnants had been turned-over. The entire floor of Whareana Bush had been disturbed. Occasional cattle browsing ensured that any surviving seedling was regularly pruned. The palatable Pratia physaloides appeared to be a favoured delicacy. The recent arrival of the opossum in the Far North adds another dimension to the risk to the flora of the area. It is hoped that the type of vandalism recently experienced at Kaimaumu and Whangamarino does not extend to the North Cape area.

HEATHLAND ORCHIDS

Te Paki R.R.

Scott Point & Cape Reinga

Scott Point is an outcrop of uplifted, consolidated dunes reaching 120 m a.s.l., lying at the northern end of Ninety Mile Beach, The weathered sand and sandy loams support a dominant cover of manuka (Leptospermum scoparium) with Cyathodes juniperina, Leucopogon fasciculatus, Hakea sericea and H. gibbosa sharing sub-dominance. Bare ground can extend from 40-607. with plants in the upper and more exposed situations dwarfed to less than 0.5 m.

At the northern end, Thelymitra aff. longifolia (bud Sept.) and Microtis unifolia (fls. Sept) are abundant. T. carnea (fls. Sept.) and T. pauciflora (bud Sept.) are common throughout. In hot, dry bare sand, the most difficult conditions possible for orchids, Cyrtostylis reniformis (seed Sept.) and Acianthus sinclairii (seed Sept.) were unusually abundant. Except occasionally under the protection of manuka, these orchids were stunted and flowering was sparse. The fern ally, Phylloglossum drummondii (sporangia) was common and widespread in open ground.

On the trackside (part of the Cape Reinga to bluff walkways system) Caladenia minor (spike Sept.) appeared in occasional colonies under manuka. Prasophyllum pumilum (seed Sept.) was not uncommon throughout.

A few specimens of T. sp. "rough-leaf" and T. sp. "darkle" were noted on a damp section of the track.

Orchids were less common on the ridge extending southward towards Ninety Mile Beach. T. carnea, T. aff. longifolia, T. pauciflora and M. unifolia were not common. Just one specimen of both C. minor and Orthoceras novae-zeelandiae were sighted.

Hiriki Pa trig, 240 m a.s.l. is the highest point on the west coast of the Park. This exposed basalt, volcanic uplift has an overlay of eroded, stony clay soils. On the northern side, access is via the Crack leading from the Cape Reinga Road. On the saddle and flatter ground, a short distance from the road, T. aff. longifolia and T. pauciflora are common among the stunted manuka, flax (Phormium tenax) and Corokia cotoneaster. Near the top of the hill and along the southern ridge, the track is almost completely overgrown. Only occasional specimens of the Thelymitra spp., already noted, were sighted.

The second spur, leading down to the back of the high dunes, provides access to Te Werahi beach. On this windswept slope, M. unifolia join the two Thelymitra spp. as the only orchids noted.

An investigation was made of the damp soaks immediately behind the

unstable dunes towards the wetland outflow. *M. unifolia* was common in some soaks but no other orchid was seen.

As observed earlier on Tom Bowling, Waikuku and Whareana beaches, wind erosion had exposed human skeletons and bones* The numerous heaps of hang! stones and old middens attest to the significant population of the area in earlier times.

From the northern end of the beach the 'Walkway' track climbs steeply up the razorback ridge to Tarawaraoma Pt. The narrow crack leading along the high cliff edge can be dangerous in windy conditions. The ubiquitous *T. aff. longifolia* and *M. unifolia* were common here and *T. pauciflora* was occasionally noted.

Shrubland near the Tapotupotu Rd exhibited a similar flora to that on nearby Hiriki Pa.

Shenstone Block

Rising to 113 m a.s.l. this area is geologically similar to the Scott Point uplift further to the north.

Lying behind the extensive dune area at the northern end of Ninety Mile Beach, the block is further inland and more sheltered. A number of steep sandstone outcrops, dissected by ravines, form an interesting landscape. The higher slopes contain a number of sink-holes - perfect sand basins with honeycombed, jagged sandstone outcrops forming the perimeters. These most unusual features rival those of the Ohao area. Prior to purchase by the Dept. of Lands and Survey, cattle had rough-grazed the area but with little feed available, disturbance does not appear to be great. There is minor evidence of pigs. The vegetation is old and the abundance of saprophytic orchids is unrivalled anywhere else in the Park.

Below the north-western slopes there are a couple of shallow enclosed lakes, draining into the Te Pahi Scream which runs near the northwestern boundary* Plant cover is dense up to the water line.

The vegetation throughout the block is predominantly manuka. Sedges and *Hakea sericea* are dominant in places, sometimes forming impenetrable thickets. The gullies often support a dense cover of ferns along the streamsides. Some of the best groves of *Sticherus flabellatus* and *Todea barbara* are to be found below the waterfall alongside the access track and along the stream to well past the bridge at the entrance.

Visits were made in November and December 1989.

Access track (from the Te Pahi Stream Road).

On the track through the stand of sparse old pines *Microtis parviflora* (fls.) and *Thelymitra pauciflora* (bud) were common. Under the pines there were extensive colonies of *Corybas cheesemanii* (seed) and occasional, small colonies of *Gastrodia sesamoides* (bud, fls.).

Along the track between the pines and the waterfall *T. carnea* (seed) and *T. pauciflora* (bud) were not uncommon. *M. parviflora* and *T. aff. longifolia* were common. *Caladenia* sp. (cf. *alata*) (seed) was occasionally noted. From the waterfall, for c. 1 km to the upper ridge where tracks cross, orchids were sparse. Two specimens of *Thelymitra* "darkle" (fls. just finishing) were sighted on the trackside and *Microtis unifolia* (fls.) was occasionally noted. *Corybas cheesemanii* (seed) was uncommon under tall *Kunzea*.

Microtis in this area appears to be intermediate between *M. unifolia* and *M. parviflora*. Some flowers exhibit the broad labellum of *M. unifolia* but lack the 'frills' and are not bilobed.

The track and surrounds leading east from the "crossroads" up to the

high ridges in the centre of the block produced the nose interesting orchid flora. Near the start of the crack was a colony of 30 plants of Thelymitra aemula (fls. Just finishing). Growing with these were several Gastrodia sesamoides (buds, fls.). This association continued for c. 70 n down the track, with occasional sightings made of C. cheesemani, T. carnea and T. aff. longifolia. Orthoceras novae-zeelandiae was locally common and M. unifolia abundant.

The uplands were very dry and parched. Orchids were few, with Thelymitra aemula and T. aff. longifolia occasionally sighted.

Dense thickets of Hakea sericea made the traverse to the eastern side of the block impossible by this route, so a retracing of steps was required. Time was spent investigating the tall manuka stands in the vicinity of the Gastrodia noted near the "crossroads". The habitat here is a sandy, clay loam supporting manuka (3 m, dominant) with bracken, Coprosma rhamnoides, gorse and Leucopogon fasciculatus forming the sparse understorey and margins. There is a relatively deep litter in which G. sesamoides (buds, fls.) Corybas cheesemanii (seed) and C. cryptanthus (seed) thrive in large numbers. On a second trip (December) this area and the track on the western side of the "crossroads" were investigated more thoroughly. More than 300 flower, stem of C. cryptanthus were counted. Corybas cheesemanii was abundant and c. 50 stems of Gastrodia sesamoides were observed. From herbarium specimens collected, it is possible that leafless forms of C. cheesemanii could be present and hybridisation may also occur. In the same locality small colonies of Caladenia "green column" were noted under tall manuka. Further investigation of this block is required.

Rubbish Dump Hill

This term was coined to describe a hill, 1 km south of the Tapotupotu Rd junction, on which is sited the camp ground tip. It is also used to dump surplus building, fencing materials &c and is recognised from the main road by the two redundant concrete loops on the top. Stunted manuka is dominant on the top and western slopes, where run-off has gouged a number of small gullies. On these red/brown clay soils Hakea sericea is dominant. T. aff. longifolia is so common that it almost takes a (seasonally) subdominant role on the ridge and southern slopes. Many plants had huge, wide, strapped leaves of more than 20 mm x 30 cm and call inflorescences with up to 25 fls. T. carnea (pink and yellow forms) (fls. Sept.) is common everywhere, especially on the eroded, north-facing slope. Orthoceras novae-zeelandiae, M. unifolia and T. pauciflora are common throughout.

Caladenia minor (spike Sept.) is not uncommon on the edge of the taller Hakea, at the base of the eroded slopes. Prasophyllum pumilum (fls., seed July) occurs in colonies in the damper and shaded areas.

One small colony of Pterostylis alobula (fls. July) was found under stunted manuka on the crack down to the tip. An interesting find here was a small colony of Calochilus herbaceus (fls. Nov.) growing in and along the edge of a drain in the damp conditions it prefers.

Darkies Track (Tapotupotu - Pandora gate)

Recently upgraded, this 6 km track is part of the Spirits Bay-Cape Reinga walkway and provides some of the best views of the western end of the Park. Orchids are found frequently along the track, with all the species common in the Park well represented. M. unifolia, M. parviflora, T. pauciflora, T. aff. longifolia, T. carnea, T. aemula and

Orthoceras novae-aeelandiae are common. One of the few sightings of T. tholiformis (fls. -Nov.) was made not far from the Tairāwhiti Pa. Pterostylis plumosa was reported from a slashed track leading toward the coast 400 m E from Pandora gate. (P. Mayhew, pers. comm.)

Inland crack (Tapocupocu - Pandora gate)

Near the Pandora gate, an overgrown crack runs along the eastern ridge above the Tapocupocu Stream. The clay soils are eroded for much of the track, with cover often only 20-50%. Manuka is dominant, with Hakea sericea and H. gibbosa subdominant. Other common plants are Lycopodium cernuum and Dracophyllum sp. T. aff. longifolia and T. pauciflora are common and most other species that occur on Darkles Track are present. Two orchids not sighted on Darkies were T. aff. pulchella (spike Sept.) and Caladenia minor (lvs. Sept.). Both were not common. T. aff. pulchella, a common and widespread orchid in other areas of the far north prefers damper conditions than those prevailing in the Park and was found to be relatively uncommon there. Track to Pandora and Te Pahi Trig

All the common orchids of the western end of the highlands were recorded. Another sighting here of Pterostylis alobula (fls. July) in two small colonies under manuka on the trackside between the Radar Bush access and Pandora gate. Thelymitra aemula (fls. Nov.) is uncommon on the trackside from below the Radar Bush access up to the Trig. The dominant species along most of the crack is again manuka; sub-dominant in places are Cotula sargentosa. Coprosma robusta and the tangle fern (Clethra dicarpa).

Late in 1989, Anthony Wright and Ewen Cameron reported Chiloglottis cornuta, Corybas cheesemanii and Castrodia sesamoides from under tall Kunzea ericoides below Kohuronaki.

Radar Bush access crack and nearby ridges

Until reaching the bush margin, for the most part the crack is bare clay with 20% cover, with manuka (dominant) and Dracophyllum sp. (sub-dominant). Thelymitra carnea is common; T. pauciflora. T. aff. pulchella, T. aemula and Prasophyllum purn 1 turn are occasional to not uncommon. Aclanthus sinclairii (seed Sept.) and Caladenia minor (lvs. Sept.) are occasionally encountered. The last of three sightings of T. choiliformis was on this crack.

Across the stream, at the end of the Radar Bush access, the crack leads up the ridge to the Pandora gate. T. aemula, T. pauciflora, M. parviflora and Caladenia. "green column" are uncommon. Pterostylis trullifolia is common in scattered colonies. T. "darkle"¹¹ was observed occasionally above the groves of sapling monoao and kauri.

Spirits Bay Road and catchment areas

Tracks on both sides of the Spirits Bay Road between the quarry and Te Hapua Rd turnoff were surveyed in July. Thelymitra aemula, T. aff. longifolia and T. pauciflora were common in the vicinity of both tracks. Prasophyllum pumilum (seed) was common on the crack above the road. Manuka (0.5-3 m) dominates on the heavy clay soils. Uncommon species in the area include T. carnea, T. "rough-leaf", Acianthus siliqua 1r11 and C. alata. Pterostylis alobula and P. trullifolia were both in flower in small, localised colonies.

On the disturbed clay roadside bank at the base of the hill below the Te Hapua turnoff, all the above Thelymitra spp. were present* An additional record was T. aff. pulchella.

Earth Wall track

The wall was built c. 1900 by gumdiggers as a water diversion for gum sluicing. Constructed with earth sods, the wall has a height of 1.2 re and is almost 1 km in length. The outlet is into Waitahora stream, just above the head of the Paranoa swamp.

Leading from the Spirits Bay Road, the access crack follows a ridge through gumland for 3.5 km. Typical podsolised fine sandy and silty clay loams overlay the mudstone and sandstone pans. These acidic, poorly drained soils suit terrestrial orchids.

Some interesting orchids are found growing in the shelter and shade of the manuka (dominant) along the tracksides. Dracophyllum sp., Pomaderris kumeraho, Hakea and sedges are locally sub-dominant. The endangered Calochilus herbaceus (fls. Nov.) was rare near a damp section of the track. A few specimens of a small green form were noted some distance further on. T. aff. ixioides (fls. Nov.) is found occasionally along the ridge. Other Thelymitra spp. uncommon in the Park were T. "rough leaf", T. aff. pulchella, T. tholiformis and T. "darkle". Common orchids include M. unifolia, P. pumilum, C. alata, C. minor, T. pauciflora, T. aff. longifolia, T. carnea, T. aemula and Orthoceras novae-zeelandiae. One small colony of Pterostylis alobula (seed Nov.) was sighted.

Vegetation has been removed for 4 m. each side of the section of wall to the west of the track. Adjacent to the track Acianthus Sinclairii and O. novae-zeelandiae were in small numbers. C. alata is common on the wall, as is P. trullifolia which also spreads along the cleared areas in fairly large colonies. One small colony of C. aff. unguiculatus (seed Sept.) was also found in the clearing. Previously, the northernmost record for this orchid was Kaimaumu.

Along the roadsides between the Earth Wall track and Spirits Bay, Microtis parviflora (fls. Nov.) is abundant and large specimens of T. carnea are not uncommon in and near the roadside drains. One plant had an inflorescence measuring 30 cm with a raceme of 7 flowers. In the damp sand and grassy areas near the cattle stop at Spirits Bay, T. aff. longifolia, T. pauciflora, T. carnea and T. "darkie" (fls. Nov.) were not uncommon.

The gumland catchment area has a rich orchid flora, including a number of rare and endangered species and warrants further investigation.

Mokaikai S.R.

Taumataroa Flat and other gumlands in vicinity

Taumataroa Flat is an upland gumland sand plateau 1 km² at the head of the Mokaikai catchment. Typical sandy and peaty sand loam soils overlie sandstone and ironstone pans. The predominant cover is fairly dense manuka (0.5-3 m) and sedges. Dracophyllum and Leucopogon fasciculatus are usually the sub-dominant species. Corybas oblongus, a shade-loving orchid, is common in damper areas. On the plateau and adjacent roadsides, P. trullifolia is not uncommon under the taller manuka. Common on the drier, northern edge and nearby tracksides are T. aff. longifolia, T. pauciflora, T. carnea, T. aff. pulchella and Microtis unifolia. Less common are Orthoceras novae-zeelandiae, Prasophyllum pumilum, T. "rough-leaf" and Acianthus sinclairii,

In taller manuka (near the fire reservoir on the "short cut" track that leads to North Cape) a few small colonies of Caladenia alata were noted and C. minor was quite common. On the same track, 100 m from the Money Tree, a solitary specimen of Phylloglossum drummondii (sporangia Sept.) was noted growing in sandy humus.

Thelymitra carnea, T. aff. longifolia, T. pauciflora, M. unifolia and A. sinclairii are all common on the seaward side of the road as it descends the highlands towards the Waikuku Flat. The habitat here is gumland scrub with a cover predominantly of manuka (0.5-2 m).

A ridge of the northern flank of the Ponaki wetland was investigated in March. Spent inflorescences of T. aff. longifolia and other T. spp. were not uncommon. A return to this habitat later in 1988 was not possible. Few orchids were noted on the gumlands in the Mokaikai catchment. Overlying the highly siliceous mudstone pan are sandy and peaty sand loams. P. pumilum, T. aff. longifolia, T. pauciflora and T. carnea are occasionally encountered.

Ohao S.R.

Ohao plateau

The same species noted in the Mokaikai catchment extend into the upper part of the Ohao plateau. The plateau consists of unconsolidated dunes with sandy and soft clayey sand soils. In March a few small wet depressions were also searched without success.

This area would enthuse any landscape photographer. The wind-eroded, symmetrically honeycombed sandstone outcrops are an amazing sight. Ancient kauri stumps and roots protrude from the sandstone pan which is littered in places with nuggets of gum. Manuka bushes, dwarfed by exposure to wind, struggle to maintain a tenuous hold on the eroding sand hillocks, their disproportionately large root systems often extending over bare ground in many directions for more than six metres. Magnificent views of the glistening Kokota silica sandspit, the clear blue waters of The Parengarenga harbour and Mokaikai beach add to the delight of this south-eastern extremity of the Park.

Waikuku Flat

The Waikuku sand tombolo, about 3 km at its widest and a little more than 2 km at its narrowest point, links the Unuwhao highlands with the North Cape massif. Rising little above sea level on the east coast, this fixed, unconsolidated dune spit rises gradually to 10 m ± a.s.l. behind Tom Bowling Bay on the northern coast. The Flat once supported a kauri forest which was drowned by rises in sea levels in earlier times. Fires through the area during Maori habitation and gumdigging activities have assisted in impeding forest regeneration. For the most part the soils are soft, clayey sand interspersed with peaty fresh water swamps and depressions. Manuka is dominant over almost the whole gumland area.

In some parts, the cover is less than 1 m with some bare ground at intervals. Occasional stands of manuka reach 3-4 m in the damper areas.

Baumea juncea and Gleichenia dicarpa are often sub-dominant. The cracks through the area were investigated and T. pauciflora, T. carnea and Microtis unifolia were found to be common. T. aff. pulchella was rare.

North Cape S.R.

Once an island, the North Cape massif rises from the Waikuku sandspit to 230 m + a.s.l. at its highest point (trig). After ascending the steep rise over eroded stiff red clay soils a broad tableland (180 m a.s.l.) is reached. On the northern coast the Surville Cliffs stretch for 3 km, intersected by a number of deeply eroded ravines, but for the most part, falling abruptly to the sea far below. The cliffs and adjacent areas consist of serpentinite rock with highly mineralised iateritic soils. The flora here has adapted a number of unique variants in response to the low calcium - high mineralisation. It is conceivable that orchids could have evolved in a similar manner to the dicots, however none of the species noted displayed any obvious differentiation.

At the Kerr Point end of the cliffs one specimen of Pterostylis plumosa (seed Nov.) was sighted on a small bank in association with stunted manuka and Baumea juncea, Thelymltra aff. longifolia is common here and is indeed the most common orchid on the entire promontory.

Along the roadsides to the west of the serpentine quarry Microtis unifolia (fls. Nov.) is common. T. pauciflora (fls. Nov.) and Acanthous Sinclairii occur in lesser numbers under the taller manuka.

The vegetation between the road and the cliffs is stunted (less than 1 ha.) but is quite dense for the most part. T. aff. longifolia, T. pauciflora and T. carnea are common and frequently found growing within 0.5 m of the cliff edge. T. aemula (fls. Nov.) is found on the cliff edge and near the taller rewarewa and Phyllocladus 'serpentine' on the perimeters of the eroded gullies. M. unifolia is common along the cliffs and bluffs. A small colony of A. sinclairii (lvs. Nov.) was found on a northerly slope under stunted manuka. The first of a number of sightings of T. "darkie" was made here - a single, pink flowered plant.

A. sinclairii was noted on the plateau, completely hidden under a sprawling Leucopogon fasciculatus bush and appears to be not uncommon there. One colony (c. 40 plants) of Cyrtostylis oblonga (seed Sept.) was observed on the edge of the plateau. A few specimens of T. aff. longifolia were the only orchids observed along the track leading towards North Cape (Murimotu Island) before the descent from the plateau. T. aff. longifolia and T. pauciflora were abundant in the areas where the dense Baumea juncea of the tops becomes more sparse.

The areas west and south-east of the quarry were investigated and a surprising number of orchids were found - mostly in the damp areas where erosion had disturbed the soil. The largest number of T. "darkie" seen on the survey can be located west of the quarry. T. aemula is not uncommon here also. On the eroded slopes and ridges to the south-east of the quarry, the two previously mentioned species are joined by good numbers of O. novae-zeelandiae and T. carnea.

One of the most interesting finds of the survey was made in the Scientific Reserve - one specimen of Thelymltra matthewsii (seed Nov.). My identification was later confirmed by Dr Brian Molloy and Dr Nigel Clunie, who had been in another part of the Reserve when the observation was made. A thorough search of the area was impossible due to the lateness of the day and necessity to return to our base at Cape Reinga. This species had not been observed for almost seventy years and was considered to be extinct in New Zealand. It is interesting to note that the original location of T. matthewsii is 100 km further south.

Motuopao Island N.R.

This small island near Cape Maria van Diemen was the original site of

the lighthouse which now stands on Cape Reinga. Although just a few hundred metres from the headland, the treacherous waters of the channel make access difficult to the only landing point. Largely covered with grasses, the island supports little shrubland habitat suitable for orchids. Thelymitra aff. longifolia and Microtis unifolia were the only orchids recorded during 1988. (L. Forester pers.comm.)

• WETLAND ORCHIDS •

Representative areas in the three major wetlands were surveyed in December 1989.

Ponaki wetland - Mokaikai Scenic Reserve

From the North Cape road, the ridge track on the northern flank provides the best access. Flowering of the heathland orchids in this area was finished. Only Thelymitra aff. longifolia, T. pauciflora and Microtis could be identified with any certainty. Fresh water soaks behind the dunes at the lower end of the track were the habitat of Microtis parviflora (fls., seed). This wetland is very wet with a number of lakes stretching from the headwaters almost to the outfall into Mokaikai beach. Margins suitable for orchids are few and usually quite small. A likely-looking habitat in the southern lower end of the swamp was investigated. After what appeared would be a fruitless search, a small colony of Spiranthes 'Motutangi' (3 plants in bud and 1 juvenile) was found, hidden among tall sedges. No other orchids were sighted in the general area.

Paranoa wetland - Te Paki R. R. (Spirits Bay)

Along the narrow margin of an arm behind the dunes a scattered colony of c. 50 plants of Thelymitra "darkle" (seed) were noted. The only other orchids seen in this area were two Thelymitra sp. seedlings. The habitat here had a peaty-sand soil with 70% cover of manuka to 1.5 m.

The Waitahora arm proved heavy going as the slow trudge was made out from the coast to the running water. The search was for Spiranthes, Prasophyllum and Pterostylis. No sightings of orchids were made during a series of arcs through the dense cover of raupo and sedges. On reflection, perhaps a survey of this wetland in the month of January would yield better results.

Te Werahi wetland - Te Paki R. R.

One solitary specimen of Prasophyllum aff. patens was recorded in this swamp in 1984 by E.K. Cameron. The area where this had been found was searched to no avail. A more open section of the swamp margin further to the east produced two flowering plants of Spiranthes 'Motutangi'. In association, on small peat hummocks a colony of c. 20 plants of an odd-looking Thelymitra pauciflora (fls., seed) were noted. Flowers all exhibited a deeply cleft post-anther lobe. Some flowers had no or few cilia on the column arms. These characteristics are also to be found in Thelymitra "sancilia". Although close, the Te Werahi plants did not match the typical form of T. "sancilia". The conclusion was that this is a self-perpetuating colony of an aberrant form of T. pauciflora. No other orchids were noted in this section of the wetland.

Another part of this extensive wetland, the catchment between Twilight beach and Te Werahi, was investigated. In recent times the main stream had obviously changed course

and what would have been suitable orchid habitat had disappeared under a heavy cover of silt. Manuka and raupo were the predominant cover species. No orchids were sighted in this area.

SUMMARY

The study of other sections of the flora has already indicated the high botanical significance of the North Cape area. With 40% of the New Zealand orchid species represented - many of them endangered, rare and endemic to Northland - the botanical importance is further heightened.

As with other areas of the Northland peninsula, there is a significant representation of 'Australian' orchids. Together with earlier, casual surveys of forests, heathlands and wetlands north of Waipoua, the Te Pahi survey assists in producing a more complete picture of the unique and diverse orchid flora of northern Northland. The northernmost limits of the distribution of a number of orchids have been ascertained.

The Park, much modified by grazing, fire and erosion, is still under threat from animals and mammals. Perhaps the greatest threat to the flora is the recent arrival of the opossum. The small remaining forest remnants contain some unique species and plant associations. There are very few coastal remnants of any size and these are comprised mainly of species that the opossum finds palatable.

In recent times wild cattle and horses have been removed and there are attempts being made to reduce the pig population. The land snail (*Placostylus* spp.) is under threat from pigs and rats. In the forest remnants visited during 1988 there was evidence of snail damage caused by rats.

The only significant remaining population of *Placostylus* (ssp. *michiei*) is found on the North Cape promontory. Rat traps placed throughout the Park and baited initially, have been neglected in recent years.

In conclusion, there can be little doubt that the Te Pahi Farm Park contains the most important orchid habitat in Northland, if not New Zealand.

Table 1. List of species - Te Pahi Farm Park - 14 December 1989

Key: * = New Zealand endemic	! new record for Park
* <i>Acianthus sinclairii</i>	M. unifolia
* <i>Bulbophyllum pygmaeum</i>	* <i>Orthoceras novae-zeelandiae</i>
! <i>Caladenia alata</i>	* <i>Prasophyllum</i> aff. <i>patens</i>
! <i>C. minor</i>	<i>P. pumillum</i>
*! <i>C. "green column"</i>	* <i>Pterostylis alobata</i>
! <i>Calochilus herbaceus</i>	* <i>P. banksii</i>
(+ green form)	* <i>P. graminea</i> var. <i>rubricaulis</i>
! <i>Chiloglottis cornuta</i>	! <i>P. plumosa</i>
* <i>Corybas acuminatus</i>	* <i>P. trullifolia</i>
*! <i>C. cheesemanii</i>	* <i>Spiranthes 'Motutangi'</i>
*! <i>C. cryptanthus</i>	*! <i>Thelymitra aemula</i>
* <i>C. oblongus</i>	<i>T. carnea</i>
* <i>C. trilobus</i> *	* <i>T. aff. longifolia</i>
! <i>C. aff. unguiculatus</i> *	! <i>T. matthewsii</i>
! <i>Cyrtostylis oblonga</i>	<i>T. pauciflora</i>
<i>C. reniformis</i>	<i>T. aff. pulchella</i>
* <i>Dendrobium cunninghamii</i>	*! <i>T. "darkle"</i>

Drymoanthus adversus	*	T. tholiformis
Earina autumnalis	*	T. aff. ixioides
E. mucronata	*!	T. "rough leaf"
Gastrodia sesamoides		
Microtis parviflora		

Table 2. Rare, endangered and Northland endemic species

A significantly high number of rare, endangered and Northland endemic species are to be found in the Park*. Among the more noteworthy are Calochilus herbaceus and Thelymitra matthewsii. Both went unobserved for decades and were presumed extinct in New Zealand. C. herbaceus was re-discovered in Northland at Kaimaumu in 1986 and noted on Tauroa Peninsula in 1987. During the survey, C. herbaceus s.s. was observed near Cape Reinga. A second observation was made in the Spirits Bay catchment, where a "green form" was also noted.

All suitable habitat in the area was destroyed after R.H. Matthews discovered Thelymitra matthewsii near Ahipara in 1910. A chance observation of this elusive little orchid was made in the Park in November 1988. Its recent re-discovery in the Far North is not surprising. The early botanists and naturalists Colenso (1839), Dieffenbach (1840-41), Buchanan (1865-66), Kirk (1867) and Cheeseman (1896), were somewhat limited to coastal tracks and other regularly used routes. Like many of the more recent botanical forays, their visits would generally have been timed to take advantage of the more favourable summer weather. As the majority of Northland's terrestrial orchids flower in spring and are deciduous through summer, only the later-flowering species would have been evident during their visits. This would account for the paucity of early records. T. matthewsii flowers in September/October - a time when few botanists have ventured into the farthest North.

Corybas cryptanthus

This species has been occasionally recorded from Warkworth to Stewart Island. The Shenstone Block is home to an extensive colony of this imperfectly known saprophyte. Together with Thelymitra matthewsii and Calochilus herbaceus this ranks as one of the more significant finds of the survey and demonstrates how little is known about orchid distribution in New Zealand. Voucher specimens in AK (188386) and CHR.

Corybas aff. unguiculatus

Was also known only as far north as Kaimaumu. During the September survey, one small colony of fruiting plants was sighted in the Spirits Bay catchment. This winter-flowering species tends to grow in comparatively small, localised colonies.

Prasophyllum aff. patens

One specimen noted in the Te Werahi wetland by E.K. Cameron (1985). This species has not been sighted (previously or subsequently) in the far north and constitutes an important record.

Pterostylis plumosa

Previously not seen north of Kaimaumu, it was observed (in seed) near Kerr Point in November. A second observation in 1988 was made near Pandora by Pauline Mayhill (pers.comm.)

Spiranthes "Motutangi"

The Northland form appears to be different from other Australasian

forms. It was observed in Paranoa (Spirits Bay) and Ponaki (Mokaikai) wetlands by McLean, Enright, Mitchell and Baggies (1985), observed on this survey in Ponaki and Te Werahi wetlands.

Thelymitra aff. longifolia

In Northland, T. longifolia s.s. has not been found north of a line between Matauri Bay on the east coast and Tauroa Peninsula in the west. This Northland endemic, insect pollinated form, - coloured white, light to deep pink and blue, is common to abundant throughout the Park.

Thelymitra "darkle"

Another Northland endemic, discovered in the Kaitaia district, 1987. This orchid occurs in small numbers sporadically throughout the Park. The largest populations are to be found on the North Cape plateau and in the Paranoa wetland.

Thelymitra "rough leaf"

Discovered at Motutangi, 1986, this species is widespread but uncommon in many areas of the Far North. In the Park this Northland endemic is uncommon and local.

Table 3. Other orchids of interest

Caladenia

No representatives of this genus had been reported previously in the Park. During the survey one Australasian species, in N.Z. confined to Northland (C. alata) and two, more widespread species, C. minor and C. "green column" were observed.

Gastrodia sesamoides

Sighted in the Park, Te Werahi wetlands (Baggies 1985); near North Cape (Beever 1987); Te Pahi highlands (Cameron & Wright 1989); Shenstone Block (McCrae 1989).

Pterostylis graminea var. rubricaulis

Wheeler (1963) recorded this species in the North Cape area. It is present in Radar Bush where it is not uncommon. It is surprising that there are no other recent records from the Park. Gardner and Bartlett (1980) and Mitchell (1984) recorded P. banksii from Radar Bush and Kohuronaki but do not record P. graminea var. rubricaulis. P. banksii was not sighted during the survey.

Thelymitra tholiformis

Formerly known as Thelymitra intermedia (sensu L.B. Moore), T. tholiformis was found in small numbers in only three localities in the Park - two in the Te Pahi highlands and one in the Spirits Bay catchment. It has also been found in the Auckland and Mangonui districts and is considered rare in all known locations. This is not T. intermedia Bergg. which upon examination of Berggren's Type and notes was found to be T. pauciflora (Dr B. Molloy, pers.comm.).

Thelymitra aff. ixioides

This species is of sporadic occurrence in Northland and is nowhere common. Noted in the Spirits Bay

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