



Orchids of the Chatham Islands



Department of Conservation
Te Papa Atawhai

Orchids of the Chatham Islands

by Brian Molloy

Published by:
Department of Conservation
P. O. Box 5086
Wellington, New Zealand

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ISBN: 0-478-22199-1

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Summary

1. This report presents information on the indigenous orchids of the Chatham Islands. The report is based on visits to Chatham (Rekohu) Island in March and October 2000, information stored in the Wellington Conservancy plants database, and additional records authenticated by specimens in the Landcare Research herbarium at Lincoln (CHR), the Auckland Institute and Museum (AK), and in the herbarium of the Museum of New Zealand, Te Papa Tongarewa in Wellington (WELT).
2. Field visits were carried out in association with Amanda Baird, Area Conservation Officer, Biodiversity, Chatham Islands, focussing on the following areas: Gillespie Stream Conservation Covenant; Lake Rakeinui; Rangaika Scenic Reserve; Tuku Nature Reserve; Awatotara and Tuku catchments; Lake Huro area including Te Awatea Scenic Reserve; western margin of Te Whanga Lagoon, including Plum Tree Conservation Covenant and Smith's Private Reserve; Nikau Bush Conservation Area; Ocean Mail Scenic Reserve; Wikura Run Station; Otoi and Te Moko Creeks, Ocean Bay; and Maunganui wetlands. Wetlands and limestone on private land were also visited.
3. Although the visits were made early and late in the season for terrestrial orchids, most of the species could be readily identified by their leaves, immature flowers, withered floral apparatus, and microhabitats.
4. At present, 30 orchid taxa can be confirmed for the Chatham Islands, including six of uncertain taxonomic status, and all but five were seen on these visits. All 30 taxa are indigenous to New Zealand including the Chatham Islands, and vary in their relative abundance, with two, *Pterostylis micromega* and *Prasophyllum* aff. *patens* considered to be of national conservation concern.
5. Six orchid taxa are identified for further study and appropriate taxonomic treatment. One, *Pterostylis banksii* var. *silvicultrix*, is endemic to the Chatham Islands and is plentiful there; another, *Prasophyllum* aff. *patens*, is endemic to New Zealand but rarely encountered.
6. Three principal orchid habitats are identified: moorland forests; moorland "clears"; and freshwater wetlands and seeps marginal to lakes and streams.
7. Twenty-two orchid taxa, supported by voucher specimens, were collected to include in the nationwide molecular survey of New Zealand orchids. Additional specimens of 13 taxa poorly represented, or not found at all, in our major herbaria were also collected. Tubers or offsets of 22 taxa were collected for cultivation, further comparative study and molecular analysis.
8. Most of the key orchid habitats have protected area status and in theory should be maintained. Browsing, trampling and uprooting (pigs) by domestic and feral animals are the main threats currently impacting on Chatham Island orchids. Maintenance of tracks provides habitat much favoured by many orchids. Freshwater riparian and lakeside wetlands are orchid habitats most under threat from cattle grazing and trampling.
9. It is recommended that a further visit to the Chatham Islands be undertaken during the principal flowering period, between October and January to resolve

outstanding questions with genera such as *Corybas*, and *Pterostylis* in particular, and to search other, mainly rupestral and wetland habitats, for additional species and known rarities; and to obtain photographs of the principal orchid habitats and species *in situ*.

10. It is further recommended that all outstanding taxonomic issues be resolved and published, and that all the information be assembled ultimately in a suitable illustrated publication devoted to the orchids of the Chatham Islands.

1. Introduction

This report, prepared for the Department of Conservation, Wellington, provides a preliminary account of the orchids of the Chatham Islands. The information provided is to be integrated with other work being carried out on the indigenous vascular plant species recorded from the Chatham Islands, more especially work on endemic and threatened taxa.

Reference to the orchids of the Chatham Islands is contained in the early accounts of the Islands' flora and vegetation by [Mueller \(1864, 1873\)](#), [Buchanan \(1875\)](#), and [Cockayne \(1902\)](#), and later by the formal and informal treatments of [Cheeseman \(1906, 1925\)](#), the series of orchid papers published in the [Transactions of the Royal Society of New Zealand from 1945 to 1954](#) by [E.D. Hatch](#), [Richards \(1952\)](#), [Moore and Edgar \(1970\)](#), [Cooper \(1981\)](#), [Johns and Molloy \(1983\)](#), and [Connor \(1998\)](#). Other references to Chatham Island orchids are contained in unpublished plant checklists such as those compiled by [Druce and Kelly \(1982\)](#) and the [Nelson Botanical Society \(1997\)](#). Incidental mention of Chatham Island orchids appears in early newsletters and later journals of the New Zealand Native Orchid Group ([Mayhill 1983](#); [Clements 1989](#); [Abernethy 2001](#)). Two problems associated with this literature are the orchid names used by the various authors, and the reliability of species records in the absence of herbarium voucher specimens. These problems and others are addressed, where possible, in the "Checklist of indigenous vascular plant species recorded from Chatham Islands" ([de Lange et al. 1999](#)) and the draft preliminary database of Chatham orchids compiled by [Peter de Lange and John Sawyer in 1999](#) (see also [Appendix 2](#)).

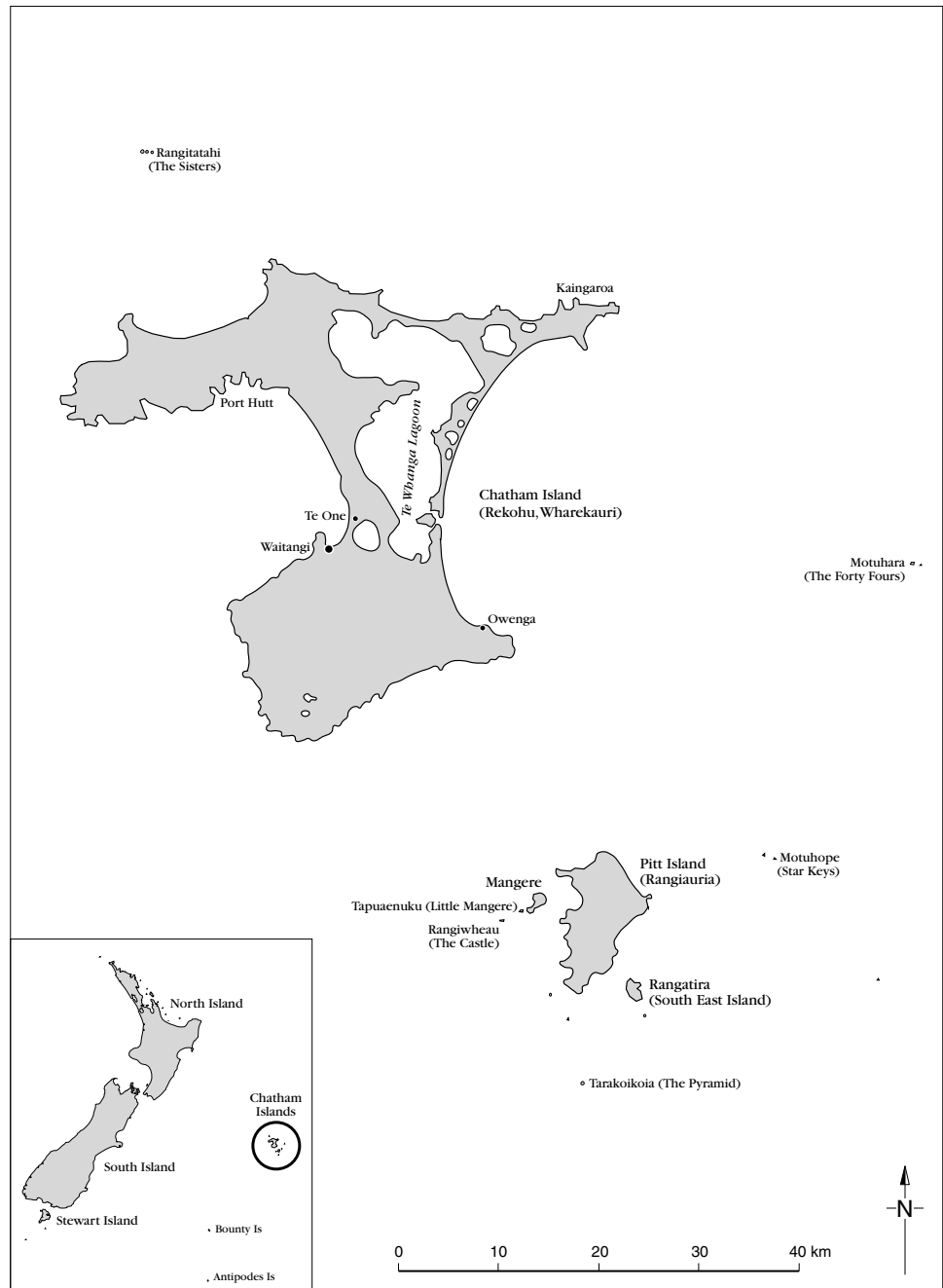
The present report attempts to carry the study of Chatham Island orchids a stage further. The objectives are fourfold:

1. To provide a definitive list of Chatham Island orchids, and an indication of their status.
2. To identify those taxa requiring further taxonomic assessment, and in due course to provide appropriate taxonomic treatment.
3. To characterise the habitats of Chatham Island orchids, especially rare or threatened taxa.
4. To contribute information from the Chatham Island survey to the nationwide molecular survey of New Zealand orchids.

2. Methods

The Chatham Islands were visited from 29 February to the 7 March, and from 21 to 29 October 2000 (see Figure 1). In the time available, only the main (Chatham) island was surveyed. Fieldwork involved examining known and likely orchid habitats with Amanda Baird, Area Conservation Officer, Biodiversity. The sites visited were based on information gathered from the orchid data base ([de Lange & Sawyer 1999](#)), herbarium specimens consulted beforehand (AK, WELT, CHR), information provided by Amanda Baird, and knowledge gained during my first visit from 4 to 18 February 1985. An attempt was made to sample a representative range of orchid habitats. However, owing to the short duration of the visits, and their timing in terms of orchid seasonal behaviour, only a preliminary survey was possible.

FIGURE 1: LOCATION OF CHATHAM ISLANDS



At each site examined, a reasonably thorough search for orchids was made, taking particular note of habitat, abundance, associates, potential threats, seasonal behaviour, and morphological variation. Although the visits were not made at the optimal time for orchid flowering, most of the non-flowering orchids encountered could be readily identified by their leaves, immature flower buds or withered perianths.

Three small collections were made:

1. Healthy leaves, stems, flowers or fruit for molecular analysis, including a voucher sample. With ground orchids, only the aboveground parts were sampled, leaving the tubers intact ([Appendix 3](#)).
2. Suitable herbarium specimens of taxa poorly represented (or not at all) in the AK, WELT and CHR institutions ([Appendix 4](#)).
3. Tubers or offsets of orchids required for follow-up cultivation and study, and/or subsequent molecular analysis ([Appendix 5](#)).

Samples for molecular analysis were prepared soon after collecting by drying in silica gel for later dispatch to Canberra. The details of the molecular survey will be reported elsewhere in due course and collated with this project. Preliminary work has been carried out on updating the orchid distribution database, both from field collections ([Appendices 3–5](#)), and records held in AK, WELT and CHR ([Appendix 6](#)).

3. Definitive list of Chatham Island orchids

Orchid taxa accepted here as part of the Chatham Island flora are listed in [Appendix 1](#). Other names previously used for these taxa in the Chatham Island literature are set out in [Appendix 2](#). The taxa listed in [Appendix 1](#) are supported by herbarium specimens in CHR, AK, and WELT (only examined in part), and all but five—*Pterostylis micromega*, *P. aff. graminea*, *Prasophyllum aff. patens*, *Spiranthes novae-zelandiae*, and *Winika cunninghamii*—were seen during this survey and their identity confirmed.

All the taxa listed in [Appendix 1](#) are indigenous to New Zealand, including the Chatham Islands, and all except *Pterostylis micromega*, *Prasophyllum aff. patens* and the endemic *Pterostylis banksii* var. *silvicultrix* are relatively common on the mainland. In keeping with other elements of the Chatham Island flora, several species such as *Corybas cheesemanii*, *Gastrodia cunninghamii*, *Spiranthes novae-zelandiae*, and *Winika cunninghamii* are rare in the Chatham Islands, though common elsewhere. For a variety of reasons, as discussed by [de Lange and Norton](#) (1998), these species may always have been rare in the Chatham Island. However, apart from *Pterostylis micromega*, and *Prasophyllum aff. patens*, none of the taxa listed in [Appendix 1](#) is considered to be of national conservation concern (see, for example, [Given and Williams 1984](#), [de Lange et al. 1999](#)).

Pterostylis micromega, currently ranked as “Endangered” ([de Lange et al. 1999](#)), is the most threatened orchid in the Chatham Islands. The species has not been collected there since the 1860s by H.H. Travers and 1891 by F.A.D. Cox ([Appendix 6](#)). It was apparently recorded in 1982 in the vicinity of the Taiko camp ([Mayhill 1983](#), and pers. comm.), but no specimen was collected. Of the taxa listed in [Appendix 1](#), the following are relatively common to abundant and of little conservation concern in the Chatham Islands:

Corybas aff. *trilobus*
Drymoanthus adversus
Earina mucronata
Microtis unifolia
Prasophyllum colensoi
Pterostylis banksii var. *silvicultrix*
Thelymitra cyanea
Thelymitra longifolia
Thelymitra pulchella

The following species, though less common than the above, are probably still of little conservation concern in the Chatham Islands, so long as their existing protected habitats are maintained:

Acianthus sinclairii
Adenochilus gracilis
Aporostylis bifolia
Petalochilus chlorostylus
Petalochilus variegatus
Simpliglottis cornuta
Earina aff. *aestivalis*
Genoplesium nudum
Pterostylis banksii
Thelymitra aff. *pauciflora*

The remaining species in [Appendix 1](#) are naturally restricted for various reasons, as yet undetermined, and in some cases may be declining (*sensu* [de Lange and Norton 1998](#)) through habitat loss or disturbance as indicated below:

Corybas cheesemanii
Corybas oblongus
Corybas orbiculatus
Gastrodia cunninghamii
Microtis oligantha - declining
Prasophyllum aff. *patens*
Pterostylis aff. *graminea*
Spiranthes novae-zelandiae - declining
Thelymitra nervosa
Winika cunninghamii

As suggested by the other orchid taxa and names mentioned in the Chatham Island literature ([Appendix 2](#)), the possibility of adding further recognised species to the definitive list cannot be discounted. For example, there may be more than two species of *Petalochilus*, and additional species of *Corybas*, *Earina*, and *Pterostylis*. Observations during the optimal flowering season (Oct.-Jan.) in key wetland, rupestral and forest habitats should help to resolve that question. Although I suspect

that *Corybas macranthus* has often been confused with *Corybas* aff. *trilobus*, it could still be present in its most likely habitats, the limestone areas along the western margin of Te Whanga lagoon, and the summits of volcanic cones. Likewise, *Earina autumnalis*, an unvouchered literature record (e.g., [Cockayne 1902](#); [Richards 1952](#)) may yet be found by a careful search of the volcanic cones and other exposed rupestral sites in the Islands.

4. Chatham Island orchids in need of further assessment

At least seven taxa have been identified for further taxonomic treatment:

1. *Corybas* aff. *trilobus*

This orchid is a robust tetraploid within the diploid *Corybas trilobus* complex, reaching large dimensions in the southern tableland forests. It is common to abundant in the Chatham Islands and may also occur in the South Island and in the subantarctic islands. It is not considered to be a threatened species. As far as I am aware, this taxon is the only representative of the *Corybas trilobus* complex in the Chatham Islands. It is proposed to name and describe this orchid as a new species, and incorporate it in the nationwide molecular survey.

2. *Earina* aff. *aestivalis*

Earina aestivalis Cheeseman is recognised as a distinct coastal epiphyte in mainland New Zealand, distinguished from *Earina mucronata* Lindl., essentially inland in occurrence, by its more open growth, robust rhizomes, broader stems and leaves, and later flowering behaviour with usually larger, more brightly coloured flowers. Many plants of *Earina* in the Chatham Islands can be placed clearly under *E. mucronata*, others less confidently under *E. aestivalis* on morphological and phenological grounds. Others still, are somewhat intermediate in appearance and behaviour, and more difficult to place. Neither taxon is of national conservation concern. Preliminary molecular analysis has been carried out on *Earina mucronata* gathered from the Nikau Bush Conservation Covenant, Chatham Island in 1985.

During the present survey, material of *Earina* aff. *aestivalis* was collected from sites in the Chatham Islands to incorporate into the nationwide molecular survey of New Zealand orchids, and for further comparative studies. Until the results of these studies are known, it is prudent to retain *Earina mucronata* and *Earina* aff. *aestivalis* on the definitive list of Chatham Island orchids and withhold the name *Earina aestivalis* in the meantime.

3. *Pterostylis banksii* var. *silvicultrix* F. Muell.

This is one of the most striking and abundant terrestrial orchids to be found in moorland forests and scrub, especially on the southern tableland of Chatham Island. It has often been confused with *Pterostylis australis* Hook.f. and *Pterostylis montana* Hatch, but differs in leaf and floral characters and is here regarded as a

distinct species endemic to the Chatham Islands (see illustrations in Crisp *et al.* 2000, p.42). It is not considered to be of national conservation concern. This taxon should be treated at species rank and provided with an amended diagnosis and a fuller description. It has been included in the nationwide molecular survey, and material will also be grown on for further study.

4. *Pterostylis* aff. *graminea*

This taxon appears to be confined to the southern tableland forests, although I have personally not seen it there during my three visits to the Chatham Islands. There is an excellent suite of specimens in WELT collected in the 1860s by H.H. Travers ([Appendix 6](#)) and one sheet in AK (3500), undated, collected by F.A.D. Cox ([de Lange & Sawyer 1999](#)). The only other material of this taxon I have seen so far is the small suite gathered in the Tuku Valley in 1980 by A.M. Ringer, and deposited in AK ([de Lange & Sawyer 1999](#)).

This orchid has been mistaken for *Pterostylis montana*, but is closer to *Pterostylis graminea* in stature, leaf shape and posture, flower size, and the shape of individual floral parts. Until more, preferably fresh, material is located, the taxonomic and conservation status of this taxon are difficult to resolve with authority. It is a prime candidate for further fieldwork and inclusion in the nationwide molecular survey.

5. *Prasophyllum* aff. *patens*

There are possibly two taxa in New Zealand placed under this tentative name. One, or both, are considered to be endemic to New Zealand, and one of these is indigenous to the Chatham Islands. There is an older name and a brief diagnosis available for one or both, depending on the taxonomic outcome of the comparison. The resolution of this issue is imminent, and will involve an amended diagnosis and a fuller description. At present, this orchid is included among the taxonomically indeterminate taxa by [de Lange et al. \(1999\)](#), and is ranked as “Vulnerable”. As such, it is the second most threatened orchid in the Chatham Island flora. It has only been collected there once before, by Peter de Lange in 1996 (CHR 508996), and was not seen, though searched for, during this survey.

6. *Thelymitra* aff. *pauciflora*

This orchid appears to be confined to the northern parts of Chatham Island, usually on sandy-textured well drained ridges, where it is local but not uncommon. It forms part of the exceedingly variable *Thelymitra pauciflora* complex in need of taxonomic resolution. Plants similar to the Chatham Island taxon occur on mainland New Zealand. Material was collected during this survey for molecular analysis, and to grow on for comparison with mainland relatives.

5. Habitats of Chatham Island orchids

Three principal orchid habitats can be identified on the Chatham Islands.

5.1 MOORLAND FORESTS

These forests are still relatively extensive in the southern tablelands of Chatham Island, and although not tall in canopy height, are generally intact with an understory of tree ferns, and a fern ground layer with deep litter. Two broad forest types prevail; one dominated by *Dracophyllum arboreum* and tree ferns, the other by a mixture of endemic broadleaved hardwoods such as *Pseudopanax chathamicus*, *Coprosma chathamica*, *Myrsine chathamica*, *Meliccytus chathamicus* and *Olearia traversii*. The former supports the largest number of terrestrial and epiphytic orchid taxa, about 20 all told, either in the deep, somewhat more acid litter of *Dracophyllum* needle leaves, or in the *Sphagnum* moss polsters on poorly drained sites reminiscent of those in mainland New Zealand. Several of these orchids drop out under the broadleaved hardwoods with their more fertile litter, although one or two like *Acianthus sinclairii* and *Simpliglottis cornuta* seem favoured by the enhanced fertility. Both forest types support exceptionally large plants of *Corybas* aff. *trilobus* and *Pterostylis banksii* var. *silvicultrix*, sometimes found perching on tree ferns. In cultivation, these plants are much smaller (see, for example, [Crisp et al. 2000](#), p.42). Epiphytic orchids, especially *Earina mucronata*, and to a lesser extent, *Drymoanthus adversus* are also present, often as low epiphytes among lichens and mosses on most tree species, including tree ferns. Disturbed parts of these forests, especially track margins through *Dracophyllum* in the Awatotara catchment, are very favourable for *Petalochilus*, *Thelymitra* and *Corybas*. Little damage to orchids was apparent, although there was some evidence suggesting that tubers of *Pterostylis* had been uprooted by pigs.

5.2 MOORLAND “CLEARS”

This description is used in a generic sense to indicate those areas, formerly in moorland forest which have been cleared at different historic intervals up to the present time. The soils are mainly moorland peats with slow to very poor drainage, and the clears often include ponds and small to large lakes.

In general the vegetation is of low stature, often rather open at ground level providing suitable habitats for terrestrial orchids, and composed in the main of sedges, rushes and allied plants, low bracken or umbrella fern, and shrubs such as *Corokia macrocarpa* and *Olearia semidentata*. The “clears” are a prominent feature of Chatham Island, especially in the north, and form the principal habitat of *Thelymitra longifolia*, *T. cyanea*, *T. pulchella*, *Genoplesium nudum*, *Prasophyllum colensoi*, and *Microtis unifolia*. The rarities, *Pterostylis micromega* and *Prasophyllum* aff. *patens* also favour similar habitats based on the few known records from the Chathams.

Three sun orchids (*Thelymitra*) are very site specific in moorland “clears”. *Thelymitra cyanea* occupies the wettest sites, *T. longifolia* the driest risers such as ancient dune ridges, with *T. pulchella*, a stable hybrid between these two, occupying intermediate sites.

These moorland “clears” are extensive in area and support considerable numbers of sun orchids and *Genoplesium nudum*. The maintenance of these orchids will depend on the extent to which their habitat is sustained, probably by periodic burning, and protection from animal damage. Succession to taller vegetation on the one hand and overgrazing and trampling on the other appear to be the major threats. These orchids will probably be more secure on large areas of farmland that will not regenerate fully due to periodic burning and continued stock presence.

5.3 FRESHWATER RIPARIAN AND LAKESIDE WETLANDS

This bracket of comparable habitats covers a range of seeps, flushes and other sources of water moving slowly through short turfy vegetation of grasses, sedges and rushes, both native and introduced, to streams, ponds, lakes and the ocean. It is a relatively fertile situation and the principal habitat for comparatively rare orchids such as *Microtis oligantha* (together with the more common *M. unifolia*), and *Spiranthes novae-zelandiae*, the late summer-flowering pink spiral orchid. Both orchids were seen alongside Lake Huro during my earlier visit in 1985, but not during this visit due to a marked change to taller vegetation.

Microtis oligantha was observed at one other locality, namely Te Moko Creek, Ocean Bay, as a result of an earlier sighting there by Peter de Lange in 1996. The plants had been nipped off in places by animal grazing, and the habitats were severely trampled. A search of another habitat where *Spiranthes* had been collected before proved negative.

These particular wetlands are under serious threat from animal grazing and trampling, or reversion to taller, denser growths of mainly introduced plants in the absence of grazing.

5.4 OTHER HABITATS

Coastal sand dunes, and indeed coastal forests of broadleaved hardwoods, including *Corynocarpus laevigatus*, are generally poor in terrestrial orchids as well as epiphytes. The latter, especially *Earina*, are better represented in the broadleaved hardwood forest remnants along the western shore of Te Whanga Lagoon. The best habitat for *Drymoanthus adversus* is the semi-swamp forest on the margins of Lake Huro (e.g., Te Awatea Scenic Reserve) where it is common as a low epiphyte on *Coprosma propinqua* var. *martinii*.

Terrestrial orchids such as *Corybas* aff. *trilobus* and *Pterostylis banksii* and the variety *silvicultrix* can also be found in the forests around Lake Huro, and occasionally in mixed *Dracophyllum* / broadleaf forest remnants on basin peats in the north, e.g. Waihi. However, their numbers are very low by comparison with populations in the moorland forests of the southern tablelands. Also, compared to

mainland New Zealand, there is a paucity of orchids on bank, cliff and road cutting habitats, now dominated by adventives. Rupestral habitats such as limestone and emergent volcanic domes have not been searched for orchids in a systematic way. The range of wetlands on Chatham Island, especially those surrounding the more inaccessible lakes and ponds would also repay investigation.

6. Recommendations

1. That a further visit to the Chatham Islands be undertaken at some time between the months of October and January to confirm the number of species of *Petalocbilus*, *Corybas*, and *Pterostylis*; to search rupestral and wetland habitats for additional orchids and the two rarities; and to obtain photographs of the principal orchid habitats and species *in situ*.
2. That the outstanding taxonomic problems be resolved and published, and that this information be used to produce a suitable illustrated publication on the orchids of the Chatham Islands.

7. Acknowledgements

I thank Peter de Lange, Department of Conservation, Auckland, for initiating this project, and John Sawyer, Department of Conservation, Wellington, for organising and supporting it. I also thank John Mason, Department of Conservation, Chatham Island, for the generous provision of facilities, transport, and accommodation, and especially Amanda Baird who helped in so many ways on a daily basis during my visits. Other staff of the Department and local Chatham people also assisted from time to time, in particular Mike Ogle and Anna Reynolds who guided me through the Awatotara catchment and Tuku Nature Reserve.

The use of the Chatham Island orchid collections held at Landcare Research (CHR) the Museum of New Zealand, Te Papa Tongarewa (WELT), and the Auckland Institute and Museum (AK) is gratefully acknowledged. I also thank the staff at CHR for help in processing samples and voucher specimens for molecular analysis.

Finally, I am grateful to my orchid colleagues Mark Clements and David Jones, Centre for Plant Biodiversity Research, Canberra, for undertaking the molecular analysis, and for their continued co-operation with the taxonomy of New Zealand orchids.

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Appendix 1

CHATHAM ISLAND ORCHID TAXA CONFIRMED BY VOUCHER SPECIMENTS AND/OR FIELD OBSERVATION

- Acianthus sinclairii* Hook. f.
Adenochilus gracilis Hook. f.
Aporostylis bifolia (Hook. f.) Rupp & Hatch
Petalochilus chlorostylus (D.L. Jones, Molloy & M.A. Clem.) D.L. Jones & M.A. Clem
Petalochilus variegatus (Colenso) D.L. Jones & M.A. Clem
Simpliglottis cornuta (Hook. f.) Szlach.
Corybas cheesemanii (Kirk) Kuntze
Corybas oblongus (Hook. f.) Reichb. f.
Corybas orbiculatus (Colenso) L.B. Moore
Corybas aff. *trilobus*
Drymoanthus adversus (Hook. f.) Dockrill
Earina mucronata Lindl.
Earina aff. *aestivalis*
Gastrodia cunninghamii Hook. f.
Genoplesium nudum (Hook. f.) D.L. Jones & M.A. Clem.
Microtis oligantha L.B. Moore
Microtis unifolia (G. Forst.) Reichb. f.
Prasophyllum colensoi Hook. f.
Prasophyllum aff. *patens*
Pterostylis banksii A. Cunn.
Pterostylis banksii var. *silvicultrix* F. Muell.
Pterostylis aff. *graminea*
Pterostylis micromega Hook. f.
Spiranthes novae-zelandiae Hook. f.
Thelymitra cyanea (Lindl.) Benth.
Thelymitra longifolia J.R. Forst. & G. Forst.
Thelymitra nervosa Colenso
Thelymitra aff. *pauciflora*
Thelymitra pulchella Hook. f.
Winika cunninghamii (Lindl.) M.A. Clem., D.L. Jones & Molloy

Appendix 2

OTHER ORCHID NAMES AND TAXA MENTIONED IN THE CHATHAM ISLAND LITERATURE AND PLANT RECORDS

Acianthus fornicatus (earlier reference to *Acianthus sinclairii*)

Caladenia bifolia (earlier reference to *Aporostylis bifolia*)

Caladenia carnea (probably confused with *Petalochilus variegatus*)

Caladenia catenata (probably confused with *Petalochilus chlorostylus*)

Caladenia lyallii (probably mistaken for *Petalochilus chlorostylus*)

Chiloglottis cornuta (earlier reference to *Simpliglottis cornuta*)

Chiloglottis traversii (earlier reference to *Aporostylis bifolia*)

Corybas macranthus (no voucher specimen, probably confused with *Corybas* aff. *trilobus*)

Corybas rivularis (probably mistaken for *Corybas orbiculatus*)

Corybas trilobus (= *Corybas* aff. *trilobus*)

Corysanthes macrantha (earlier reference to *Corybas macranthus*)

Earina autumnalis (no voucher specimen)

Earina aestivalis (status to be confirmed)

Microtis porrifolia (earlier reference to *Microtis unifolia*)

Pterostylis australis (probably confused with *Pterostylis banksii* var. *silvicultrix*)

Pterostylis montana (probably confused with *Pterostylis* aff. *graminea* or *Pterostylis banksii* var. *silvicultrix*)

Pterostylis venosa (probably confused with *Pterostylis banksii* var. *silvicultrix*)

Sarcobilus adversus (earlier reference to *Drymoanthus adversus*)

Thelymitra formosa (probably mistaken for *Thelymitra pulchella*)

Thelymitra venosa (earlier reference to *Thelymitra cyanea*)

Note

This list includes only the more common names referred to in the Chatham literature and plant records. It is not a complete synonymy of Chatham Island orchid taxa and names.

Appendix 3

CHATHAM ISLAND ORCHID TAXA SAMPLED FOR MOLECULAR ANALYSIS

TAXON	SOURCE	DATE	VOUCHER
<i>Acianthus sinclairii</i>	Tuku Nature Reserve	4-3-00	CHR532784
<i>Adenocbilus gracilis</i>	Tuku Nature Reserve	4-3-00	CHR532785
<i>Aporostylis bifolia</i>	Tuku Nature Reserve	4-3-00	CHR532786
<i>Petalocbilus chlorostylus</i>	Tuku Nature Reserve	4-3-00	CHR532791
<i>Petalocbilus variegatus</i>	Tuku Nature Reserve	22-10-00	CHR534769
<i>Simpliglottis cornuta</i>	Tuku Nature Reserve	4-3-00	CHR532790
<i>Corybas oblongus</i>	Otoi Creek	5-3-00	CHR532781
<i>Corybas orbiculatus</i>	Te Awatea Scenic Reserve	25-10-00	CHR534751
<i>Corybas</i> aff. <i>trilobus</i>	Rangaika Scenic Reserve	1-3-00	CHR532777
<i>Drymoanthus adversus</i>	Te Awatea Scenic Reserve	3-3-00	CHR532780
<i>Earina</i> aff. <i>aestivalis</i>	Pine Tree Conservation Covenant	3-3-00	CHR532792
<i>Earina</i> aff. <i>aestivalis</i>	Gillespie Stream Conservation Covenant	1-3-00	CHR532793
<i>Gastrodia cunninghamii</i>	Tuku Nature Reserve	4-3-00	CHR532787
<i>Genoplesium nudum</i>	Ocean Mail Scenic Reserve	2-3-00	CHR532779
<i>Microtis oligantha</i>	Te Moko Creek	5-3-00	CHR532782
<i>Microtis unifolia</i>	Gillespie Stream Conservation Covenant	1-3-00	CHR532776
<i>Prasophyllum colensoi</i>	Tuku Nature Reserve	4-3-00	CHR532783
<i>Pterostylis banksii</i>	Rangaika Scenic Reserve	1-3-00	CHR532788
<i>Pterostylis banksii</i> var. <i>silvicultrix</i>	Rangaika Scenic Reserve	1-3-00	CHR532778
<i>Tbelymitra longifolia</i>	Mangere I. (A. Baird)	22-10-00	CHR534773
<i>Tbelymitra nervosa</i>	Tuku Nature Reserve	22-10-00	CHR534747
<i>Tbelymitra</i> aff. <i>pauciflora</i>	Ocean Mail Scenic Reserve	28-10-00	CHR534750

Note

Only those taxa with healthy leaves, stems, flowers, or fruit were sampled. In some cases the timing was marginal, hence the need to collect additional material for cultivation and further sampling ([Appendix 5](#))

Appendix 4

CHATHAM ISLAND ORCHID TAXA COLLECTED AS ADDITIONAL REPRESENTATIVE SPECIMENS

TAXON	SOURCE	DATE	VOUCHER
<i>Acianthus sinclairii</i>	Tuku Nature Reserve	4-3-00	CHR532799
<i>Petalochilus chlorostylus</i>	Tuku Nature Reserve	4-3-00	CHR532800
<i>Simpliglottis cornuta</i>	Rangaika Scenic Reserve	1-3-00	CHR532801
<i>Drymoanthus adversus</i>	Te Awatea Scenic Reserve	3-3-00	CHR532802
<i>Genoplesium nudum</i>	Whangamoe Inlet	5-3-00	CHR532803
<i>Genoplesium nudum</i>	Ocean Mail Scenic Reserve	2-3-00	CHR532804
<i>Microtis oligantha</i>	Otoi Creek	5-3-00	CHR532805
<i>Prasophyllum colensoi</i>	Wikura Run Station	2-3-00	CHR532806
<i>Prasophyllum colensoi</i>	Tuku Nature Reserve	4-3-00	CHR532807
<i>Tbelymitra cyanea</i>	Wikura Run Station	6-3-00	CHR532808
<i>Tbelymitra cyanea</i>	Ocean Mail Scenic Reserve	2-3-00	CHR532809
<i>Tbelymitra pulchella</i>	Wikura Run Station	6-3-00	CHR532810
<i>Tbelymitra pulchella</i>	Ocean Mail Scenic Reserve	2-3-00	CHR532811

Note

Only those taxa poorly represented in CHR, WELT or AK, or not at all, and still in reasonable condition and identifiable, were collected. Vouchers of taxa sampled for molecular analysis are also deposited in CHR (see [Appendix 3](#)).

Appendix 5

CHATHAM ISLAND ORCHID TAXA COLLECTED FOR CULTIVATION

TAXON	SOURCE	DATE
<i>Acianthus sinclairii</i>	Tuku Nature Reserve	4-3-00
<i>Petalochilus chlorostylus</i>	Tuku Nature Reserve	4-3-00
<i>Petalochilus variegatus</i>	Tuku Nature Reserve	22-10-00
<i>Corybas cheesemanii</i>	Tuku Nature Reserve	4-3-00
<i>Corybas oblongus</i>	Otoi Creek	5-3-00
<i>Corybas orbiculatus</i>	Te Awatea Scenic Reserve	25-10-00
<i>Corybas</i> aff. <i>trilobus</i>	Tuku Nature Reserve	4-3-00
<i>Simpliglottis cornuta</i>	Rangaika Scenic Reserve	1-3-00
<i>Drymoanthus adversus</i>	Te Awatea Scenic Reserve	3-3-00
<i>Earina</i> aff. <i>aestivalis</i>	Plum Tree Conservation Covenant	3-3-00
<i>Earina</i> aff. <i>aestivalis</i>	Tuku Nature Reserve	4-3-00
<i>Genoplesium nudum</i>	Ocean Mail Scenic Reserve	2-3-00
<i>Microtis oligantha</i>	Te Moko Creek	5-3-00
<i>Microtis unifolia</i>	Ocean Mail Scenic Reserve	2-3-00
<i>Prasophyllum colensoi</i>	Wikura Run Station	2-3-00
<i>Pterostylis banksii</i>	Rangaika Scenic Reserve	1-3-00
<i>Pterostylis banksii</i> var. <i>silvicultrix</i>	Rangaika Reserve	1-3-00
<i>Thelymitra cyanea</i>	Ocean Mail Scenic Reserve	2-3-00
<i>Thelymitra longifolia</i>	Ocean Mail Scenic Reserve	2-3-00
<i>Thelymitra longifolia</i>	Mangere Is (A. Baird)	22-10-00
<i>Thelymitra nervosa</i>	Tuku Nature Reserve	22-10-00
<i>Thelymitra</i> aff. <i>pauciflora</i>	Ocean Mail Scenic Reserve	28-10-00
<i>Thelymitra pulchella</i>	Ocean Mail Scenic Reserve	2-3-00

Note

The above taxa will be grown on for further study, including sampling for molecular analysis. Four taxa, *Earina mucronata*, *Pterostylis banksii*, *Pterostylis banksii* var. *silvicultrix*, and *Thelymitra pulchella* are still held in cultivation from my previous visit to the Chatham Islands in February 1985.

Appendix 6

ADDITIONAL HERBARIUM RECORDS OF CHATHAM ISLAND ORCHIDS

SITE MACRO	SITE MICRO	DATE	REF	COMMENTS
<i>Acianthus sinclairii</i>				
Pitt Island	Glory Bay	1968	Ritchie, M.A. & I.M. (CHR178464)	on dead log in bush
Pitt Island	Glory Bay	1968	Ritchie, M.A. & I.M. (CHR178453)	on dead log in bush
Pitt Island	Glory Bay	1968	Kelly, G.C. (CHR178586)	Ponga Bush
Chatham Island	Nr. Te Awatapu lakes	1968	Ritchie, M.A. & I.M. (CHR178488)	Open scrub on knob
Chatham Island	Nr. Te Awatapu lakes	1968	Ritchie, M.A. & I.M. (CHR178484)	Under mixed bush
Chatham Island	—	—	Travers, H.H. (CHR288397)	"743"
<i>Aporostylis bifolia</i>				
Chatham Island	—	1952	Madden, E.A. (CHR82521)	
Chatham Island	—	—	Travers, H.H. (CHR288395)	"744"
Chatham Island	Kaiara	1955	Findley, J.F. (CHR87786)	Heath formation
Chatham Island	Awatotara	1967	Anon. (CHR174891)	Ent. Div. Exped.
<i>Petalocbilus chlorostylus</i>				
Chatham Island	SW Tuku area	1978	Olsen, K.P. (AK150443)	On sheet of <i>Earina</i>
<i>Simpliglottis cornuta</i>				
Chatham Island	—	—	Travers, H.H. (CHR288399)	"752"
Chatham Island	Tuku Creek	1978	Olsen, K. (AK150461)	
<i>Corybas orbiculatus</i>				
Chatham Island	Waikato Pt. edge lagoon	1968	Ritchie, M.A. & I.M. (CHR178504)	Among moss open scrub
<i>Corybas aff. trilobus</i>				
Chatham Island	Te Awatapu Lakes	1968	Ritchie, M.A. & I.M. (CHR178474)	Scrubby knob
Chatham Island	—	—	Travers, H.H. (CHR288396)	"741"
Chatham Island	L. Huro	1968	Ritchie, M.A. & I.M. (CHR178505)	under mixed bush
Chatham Island	Above S. coast	1968	Ritchie, M.A. & I.M. (CHR178476)	on tree fern
Chatham Island	Above Owenga	1968	Ritchie, M.A. & I.M. (CHR178584)	under bush
Chatham Island	Korako	1968	Ritchie, M.A. & I.M. (CHR178507)	under bush remnant
Chatham Island	Nr. Waikato Pt.	1968	Ritchie, M.A. & I.M. (CHR178506)	open scrub
Pitt Island	Tupurangi, beside lagoon	1968	Ritchie, M.A. & I.M. (CHR178461)	under mixed bush
Pitt Island	—	1968	Ritchie, M.A. & I.M. (CHR178459)	under tree fern
<i>Drymoanthus adversus</i>				
Chatham Island	L. Huro, S. shore	1982	Given, D.R. & Williams P.A. (CHR403382)	swamp forest, Abud.
<i>Earina mucronata</i>				
Chatham Island	Te Whanga lagoon	1978	Olsen, K.P. (AK150441)	
Chatham Island	Tuku Valley	1978	Olsen, K.P. (AK150444)	
Chatham Island	Tuku Area	1978	Olsen, K.P. (AK150443)	
Chatham Island	—	—	Travers, H.H. (CHR288398)	in fl.
Chatham Island	—	1968	Talbot, H. (CHR269267)	in fl. Feb.
Chatham Island	Awatotara	1967	Anon. (CHR174880)	in fl. Feb.
Chatham Island	Kaiara	1955	Findley, J.F. (CHR87423)	in fl. 20 Jan.
Chatham Island	Towards Owenga	1968	Ritchie, M.A. & I.M. (CHR178501)	Bush remnant

Chatham Island	Korako, seedling	1968	Ritchie, M.A. & I.M. (CHR178487)	Bush remnant
Chatham Island	—	1924	Martin, W. (CHR289917)	in fl. Jan.
Chatham Island	Rangaika Reserve	1982	Given, D.R. & Williams, P.A. (CHR403247)	in fl. Feb.
Pitt Island	Mt. Pitt	1968	Ritchie, M.A. & I.M. (CHR187987)	on ground, seedling
Pitt Island	Glory Bay	1968	Ritchie, M.A. & I.M. (CHR187986)	Bush remnant
S.E. Island	Rangatira trig	1986	Courtney, S. (CHR436559)	Rock outcrop
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<i>Genoplesium nudum</i>				
Pitt Island	Central Reserve	1980	Park, G.N. (CHR398162)	Peat dome
<hr/>				
<i>Microtis oligantha</i>				
Chatham Island	L. Huro	1985	Molloy, B.P.J. (CHR532812)	marshy margin
<hr/>				
<i>Microtis unifolia</i>				
Chatham Island	—	1952	Madden, E.A. (CHR82027)	
Chatham Island	Te Roto	1954	Madden, E.A. (CHR91952)	clears with bracken
Chatham Island	—	—	Travers, H.H. (CHR288393)	“742”
Chatham Island	Korako	1969	Clarke, J. (CHR189035)	cultivated
Chatham Island	—	1955	Findley, J.F. (CHR87891)	Heath formation
Chatham Island	Awatotara	1967	Anon. (CHR174890)	bog
Chatham Island	Chudleigh Reserve	1982	Given, D.R. & Williams, P.A. (CHR403091)	grassy sand dune
Mangere Island	—	1968	Ritchie, I.M. (G. 7525)	cultivated, Lincoln
S.E. Island	Western summit	1986	Courtney, S. (CHR436525)	Summit rock clefts
S.E. Island	—	1961	Bell, B. (CHR158348)	
<hr/>				
<i>Prasophyllum colensoi</i>				
Chatham Island	Chudleigh Reserve	1982	Given, D.R. & Williams, P.A. (CHR405134)	sandy short turf
<hr/>				
<i>Prasophyllum aff. patens</i>				
Chatham Island	Otoi Creek		de Lange, P.J. (CHR508996)	Fls yellow, in water
<hr/>				
<i>Pterostylis micromega</i>				
Chatham Island	—	1891	Cox, F.A.D. (WELT3441)	Herb. T. Kirk
Chatham Island	—	—	Travers, H.H. (WELT3379)	2 specimens
Chatham Island	—	—	Travers, H.H. (WELT34001)	2 specimens
Chatham Island	—	—	Travers, H.H. (WELT3554)	12 specimens
Chatham Island	—	—	Travers, H.H. (WELT3553)	9 specimens
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<i>Pterostylis aff. graminea</i>				
Chatham Island	—	—	Travers, H.H. (WELT33789)	mixed sheet
Chatham Island	—	—	Travers, H.H. (WELT3508)	
Chatham Island	—	—	Travers, H.H. (WELT3511)	
Chatham Island	—	—	Travers, H.H. (WELT34000)	
Chatham Island	—	—	Travers, H.H. (WELT3509)	
Chatham Island	—	—	Travers, H.H. (WELT3510)	
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<i>Pterostylis banksii</i>				
Chatham Island	—	—	Cox, F.A.D (WELT35407)	
Chatham Island	—	—	Cox, F.A.D (WELT35234)	mixed sheet
Chatham Island	Te Kairahau Clear	1959	Moar, N.T. (CHR97887)	small plants
<hr/>				
<i>Pterostylis banksii</i> var. <i>silvicultrix</i>				
Chatham Island	—	—	Cox, F.A.D (WELT35234)	mixed sheet
Chatham Island	—	—	Travers, H.H. (WELT33789)	mixed sheet
Chatham Island	—	—	Cox, F.A.D (WELT35270)	
Chatham Island	Te Awatapu	1925	Martin, W. (WELT67748)	
Chatham Island	—	—	Travers, H.H. (WELT3499)	
Chatham Island	—	—	Travers, H.H. (WELT3500)	
Chatham Island	—	—	Cox, F.A.D (WELT35264)	mixed sheet

Chatham Island	Tuku-a-Tamatea Reserve	1996	de Lange, P.J. (CHR486271)	duplicate AK227380
Chatham Island	Hattwoods Hole, Tuku R.	1984	Given, D.R. & Williams, P.A.	(CHR403311)
Chatham Island	Awatotara	1967	Anon. (CHR174889)	Tableland forest
Pitt Island	Waipaua Stream.	1980	Park, G.N. (CHR399103)	Forest, on tree fern
<hr/>				
<i>Spiranthes novae-zelandiae</i>				
Chatham Island	W. of Maunganui Bluff	1969	Kelly, G.C. (CHR191772)	low lying flat turf
<hr/>				
<i>Tbelymitra cyanea</i>				
Chatham Island	—	1952	Madden, E.A. (CHR82024)	
Chatham Island	S. coast originally	1968	Ritchie, I.M. (CHR188071)	cultivated, Lincoln
Chatham Island	—	1955	Findley J.F. (CHR150832)	Removed from CHR87873
<hr/>				
<i>Tbelymitra longifolia</i>				
Chatham Island	Nr. Owenga	1968	Ritchie, I.M. & M.A. (CHR178502)	Open bracken, flax
Chatham Island	Waitangi	1954	Madden, E.A. (CHR91953)	S. Dayman's 'clears'
Chatham Island	Te Kairakau clears	1959	Moar, N.T. (CHR97886)	
Chatham Island	Rangaika Reserve	1982	Given, D.R. & Williams, PA. (CHR403267)	fernland mosaic
S.E. Island	—	1961	Bell, B. (CHR158351)	
S.E. Island	Western summit	1986	Courtney, S. (CHR436526)	soil in rock clefts
Pitt Island	Glory Bay	1968	Ritchie, M.A. & I.M. (CHR178457)	open bush
Chatham Island	Clears nr. Owenga	1978	Olsen, K. (AK150447)	
Chatham Island	Tuku Valley	1978	Olsen, K.P. (AK150445)	
<hr/>				
<i>Tbelymitra pulchella</i>				
Chatham Island	—	1982	Cathcart, R. (CHR531807)	cultivated, Lincoln
Chatham Island	—	1955	Findley, J.F. (CHR87873)	mixed with <i>T. cyanea</i>
Chatham Island	Track to trig Hokapoi	1968	Ritchie, M.A. & I.M. (CHR188941)	cultivated, Lincoln
Chatham Island	—	1930	Dalrymple, K.W. (CHR3572)	