FERNS ON BANKS PENINSULA

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For a temperate country (the tropics are another matter altogether), New Zealand is rather richly and wonderfully endowed with ferns; we have about 165 native species, some 78 of them endemic (found naturally only in this country).

At first glance, Banks Peninsula might not seem a good place to look for ferns. A fern enthusiast would do better, surely, to explore the wet forests of the West Coast or Stewart Island, rather than the drought-prone, grassy hills of the Peninsula. That makes it all the more startling, then, that my latest tally of Banks Peninsula ferns totals 84 species. (For comparison, the entire British Isles musters about 45. For perspective, the whole of Australia tallies up around 420 species, while one mountain in Borneo (Kinabalu) supports more than 500!)

Why is Banks Peninsula a good place for ferns? Firstly, it is a much damper place than many people think, and even after centuries of forest destruction there remains more ferny forest habitat than might first meet the eye. Secondly, there are some oddball ferns that actually insist on living in dry places. Thus the Peninsula's fern flora includes moisture-demanding species such as delicate filmy ferns (Fig. 1) and *Blechnum colensoi*, as well as a curious handful of dry rock species (Mahan 1987; Lovis 1990; Fig. 3). There are no fewer than six species of tree fern. Three large fern genera (*Hymenophyllum, Asplenium* and *Blechnum*) each have 10 or more species here.

What survivors they are! When one considers the catastrophic obliteration of forest and the depredation by grazing mammals in the fragments that are left, one might expect a long list of extinctions. The filmy ferns do seem to have suffered badly; many species that must once have been abundant and widespread are just holding on in a few chancy corners. We thought we had lost quite a few altogether. But in recent years there have been some remarkable rediscoveries (Lovis and Daellenbach 1982 a & b; Glenny 1987; Lovis 1987; Wilson 1987). And perhaps they have survived the worst now; with changing human attitudes and increasing reserves, they could just expand their ranges again.

The rather copious literature on Banks Peninsula ferns suggests that some species have already bounced back from rarity. Armstrong (1880) noted *Blechnum vulcanicum* as "local". For a time afterwards, botanists looked for it without success; whether this was really because it was so rare or just that the searchers were looking in the wrong places, I don't know. Certainly it is quite common and easy to find now. In this case, unlike the filmy ferns, deforestation and changed conditions might have favoured its increase. That is certainly true for another native fern, bracken (*Pteridium esculentum*).

In the following pages I attempt to list Banks Peninsula's fern flora, based on extensive fieldwork between 1983 and now, and a careful perusal of the evidence for past records, some

of which are decidedly dubious. Of the 84 species I am confident about, only three look as if they might be locally extinct. All things considered, I find this figure reasonably cheering. Even more cheering would be for Botanical Society members to rediscover the lost ones.

Another cheering point: I have been working away at this list in my study on Hinewai Reserve. Whenever I wanted to check on some field detail I simply walked out my door onto the ungrazed ferny luxuriance of Hinewai, armed with my hand lens and Tupperware collecting box. Hinewai's total known fern flora stands at 55 species, all doing well, and I suspect there are some discoveries still to be made.

The main reference for authorities for names of the ferns is Brownsey & Smith-Dodsworth (1989). Some more recent revisions include Brownsey 1999; Brownsey & Lovis 1990; Chambers & Farrant 1996, 1998; Dawson *et al.* 2000.

Table 1: Checklist of Wild Ferns on Banks Peninsula

(a) Indigenous species
(b) Naturally occurring hybrids
(c) Naturalised species
(d) Dubious records

[ ] Single Brackets. No evidence of current presence on Banks Peninsula, but reliable evidence of presence in the 19th century.
[[ ]] Double brackets. No evidence of current presence on Banks Peninsula, almost certainly present in the 19th century but evidence inconclusive.

[1] Superscript number. See end notes.
* Not native to Banks Peninsula

Abundance

1 Widespread and common
2 Widespread, often common but more or less patchily distributed
3 Local, common only in one or a few localities, or else quite widespread but nowhere common
4 Local and uncommon
5 Local and rare
6 Barely naturalised
E Although reliably reported in the past, not noted in recent years and possibly now extinct on Banks Peninsula

Main Habitats

W Widespread in both forest and open habitats
F Forest and scrub
O Open grassland and fernland
R Rock outcrops and steep open banks
Co Coastal cliffs and banks
Aq Aquatic (pools, flushes, swamps, etc)

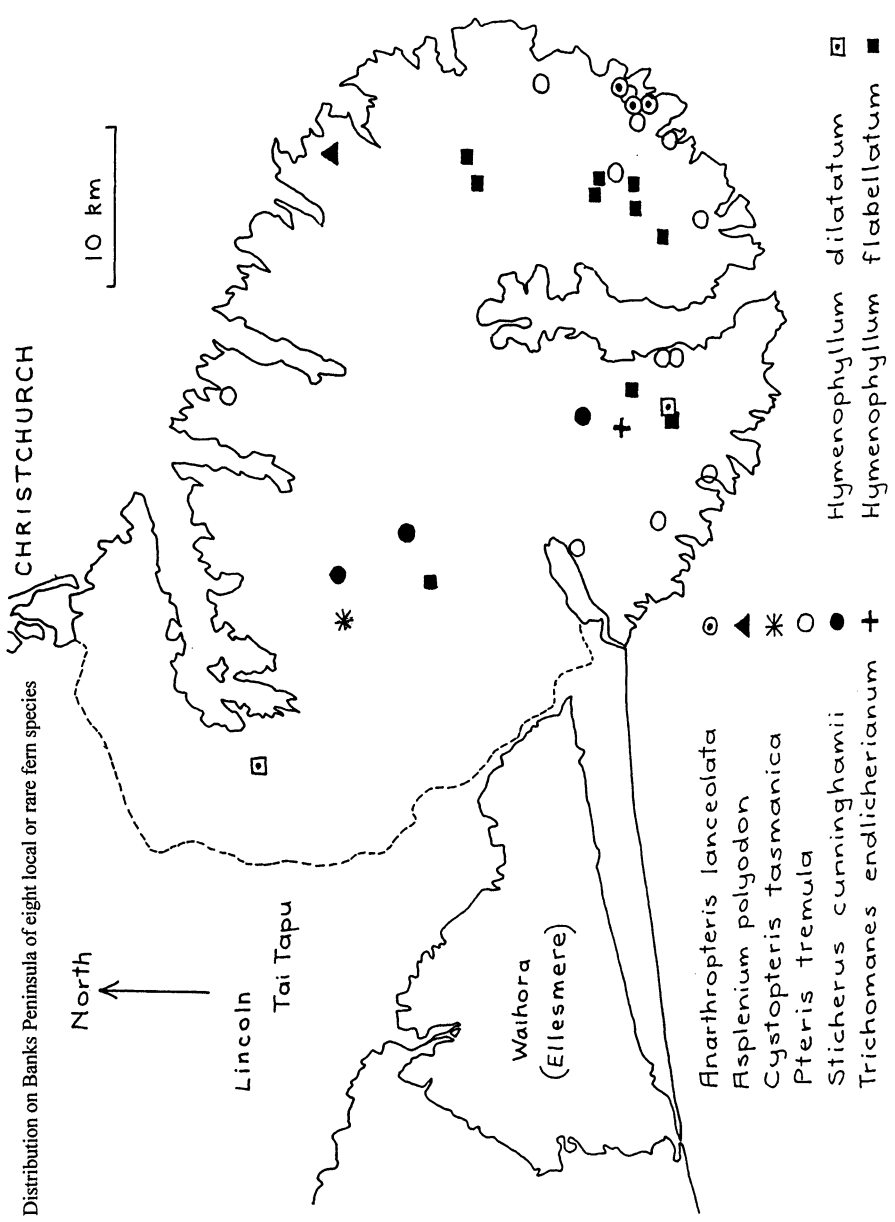
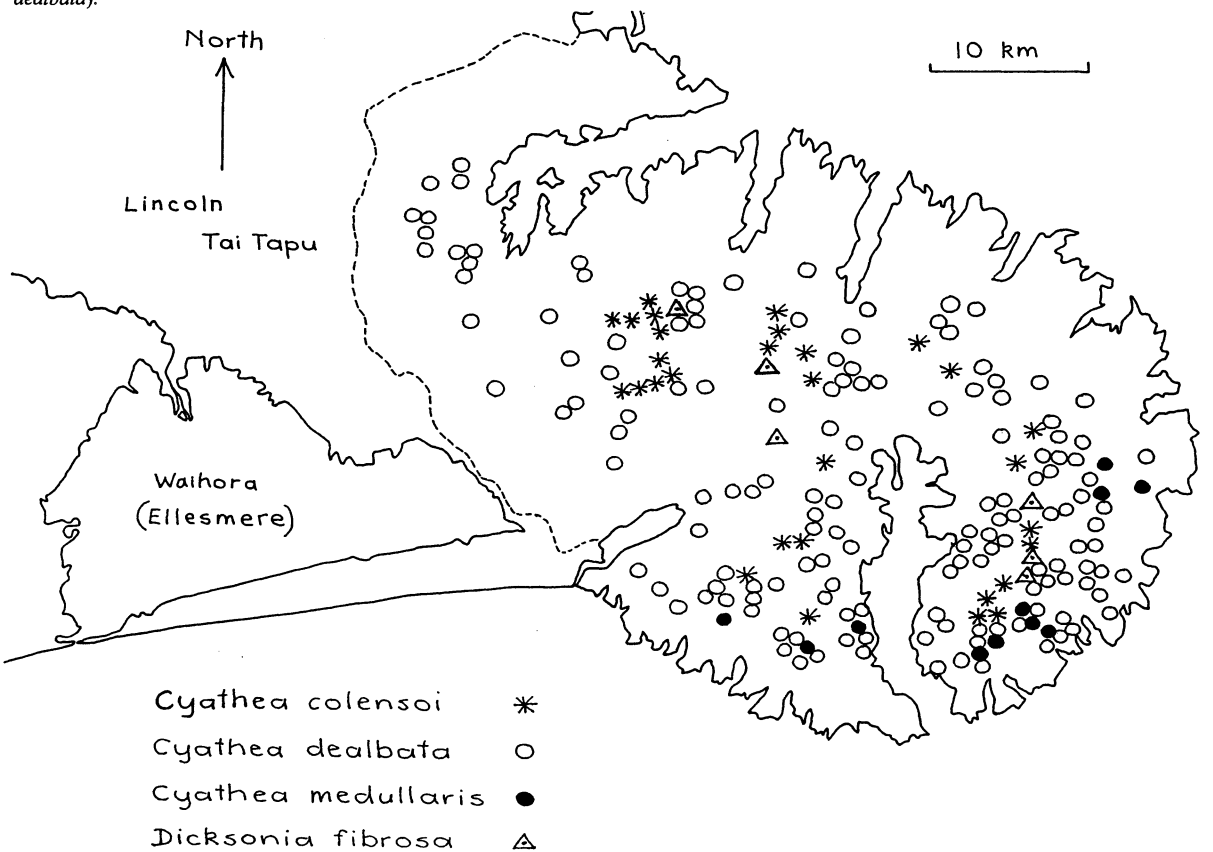


Fig. 1. Distribution on Banks Peninsula of eight local or rare fern species

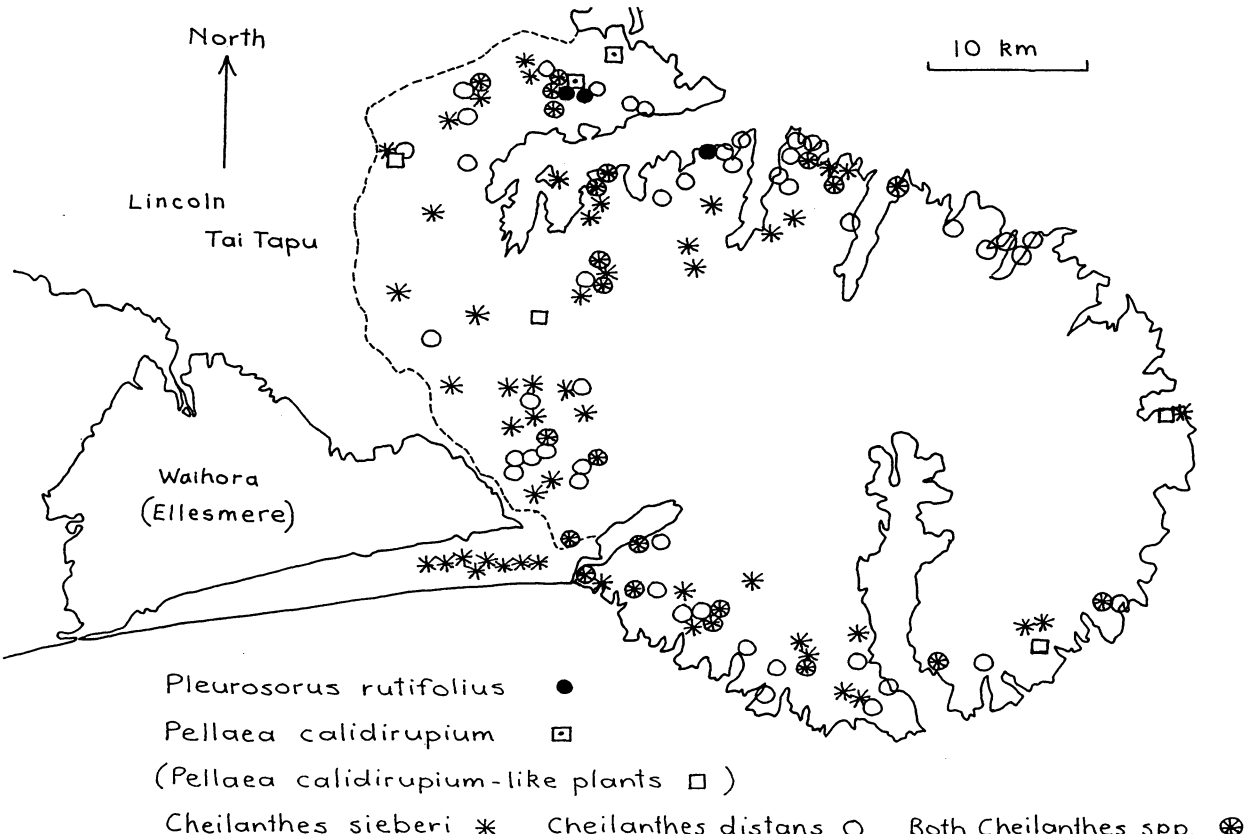
(a) Indigenous species	Footnote	Abundance	Main Habitat
Adiantum cunninghamii common maidenhair		3	F
[*A. fulvum*]	1	E	-
Anarthropteris lanceolata lance fern		5	F
Anogramma leptophylla annual fern		4	R
Asplenium appendiculatum spleenwort	2	1	W
A. bulbiferum hen and chickens fern	3	1	F
A. flabellifolium necklace fern		1	W
A. flaccidum hanging spleenwort		2	F
A. hookerianum maidenhair spleenwort	4	1	F
A. lyallii		3	F; Co
A. oblongifolium shining spleenwort		2	F
A. obtusatum shore spleenwort		4	Co
A. polyodon sickle spleenwort	5	5	F
A. richardii rock spleenwort		3	F
A. trichomanes		4	R
Azolla filiculoides Pacific azolla		3	Aq
Blechnum blechnoides	6	3	Co
B. chambersii nini		1	F
B. colensoi peretako		3	F
B. discolor crown fern		2	F
B. fluviatile kiwakiwa		1	F
B. montanum mountain kiokio		3	F
B. sp. "N.Z. minus" swamp kiokio	7	2	Aq
B. novae-zelandiae kiokio		3	F
B. penna-marina little hard fern		1	W
B. procerum small kiokio		1	F
B. vulcanicum		3	F; R
Botrychium australe parsley fern		5	F
B. biforme fine-leaved parsley fern		5	F
Cheilanthes distans woolly cloak fern		2	R
C. sieberi rock fern		2	R
Ctenopteris heterophylla		3	F
Cyathea colensoi mountain tree fern		2	F
C. dealbata silver fern		2	F
C. medullaris mamaku		4	F
C. smithii soft tree fern		2	F
Cystopteris tasmanica bladder fern	8	5	R
Dicksonia fibrosa wheki-ponga		5	F
D. squarrosa wheki		2	F
Grammitis billardierei strap fern		3	F
G. ciliata strap fern		5	F
G. magellanica strap fern	9	4	F
G. poeppigiana pygmy strap fern		4	R
Histiopteris incisa mata		2	W
Hymenophyllum atrovirens filmy fern		5	F
H. bivalve filmy fern		4	F
H. cupressiforme filmy fern	10	5	R

Fig. 2. Distribution of four out of six tree fern species on Banks Peninsula. (Not shown: *Cyathea smithii* and *Dicksonia squarrosa*, with distributions similar to but not identical with *Cyathea dealbata*).



H. demissum irirangi		4	F
H. dilatatum large filmy fern	11	5	F
H. flabellatum filmy fern		4	F
[[*H. malingii*]] filmy fern	12	E	-
H. minimum filmy fern		4	F; R
H. multifidum filmy fern		3	F
H. peltatum filmy fern	10	4	F
H. rarum filmy fern		5	F
H. sanguinolentum	13	3	F
H. villosum filmy fern	13	5	F
Hypolepis ambigua		2	F
[*H. distans*]	14	E	-
H. lactea		3	Aq
H. millefolium thousand-leaved fern		2	F; O
H. rufobarbata		2	F
Lastreopsis glabella		3	F
L. hispida		5	F
L. velutina velvet fern		3	F
Leptolepia novae-zelandiae		3	F
Leptopteris hymenophylloides crape fern		2	F
Microsorum pustulatum hound's tongue fern	36	1	W
Ophioglossum coriaceum adder's tongue		1	O
Paesia scaberula lace fern		3	O; F
Pellaea calidirupium hot rocks fern		5	R
P. rotundifolia tarawera		1	F; R
Pleurosorus rutifolius blanket fern		5	R
Pneumatopteris pennigera gully fern		2	F; Aq
Polystichum richardii shield fern		1	W
P. vestitum prickly shield fern		1	F; O
Pteridium esculentum bracken		1	O
Pteris macilenta sweet brake	15	5	F
P. tremula shaking brake		4	F
Pyrrosia eleagnifolia leather-leaf fern		3	F; R
Rumohra adiantiformis leathery shield fern		4	F
Sticherus cunninghamii umbrella fern	16	5	F
Trichomanes endlicherianum	17	5	F
T. venosum		3	F
(b) Naturally occurring hybrids (See especially Brownsey 1977b)			
Asplenium appendiculatum x *bulbiferum*			
A. appendiculatum x *flaccidum*			
A. appendiculatum x *hookerianum*			
A. appendiculatum x *lyallii*			
A. appendiculatum x *richardi*			
A. bulbiferum x *flaccidum*			
A. bulbiferum x *hookerianum*			
Blechnum novae-zelandiae x *procerum*			
Hypolepis ambigua x *rufobarbata*			
H. millefolium x *rufobarbata*			
Pellaea calidirupium x *rotundifolia*			
Polystichum richardii x *vestitum*			

Fig. 3. Distribution on Banks Peninsula and Kaitorete of four fern species from dry rocky or stony habitats. (See also Brownsey & Lovis 1990; Given 1972; Lovis 1990a and Mahan 1987).



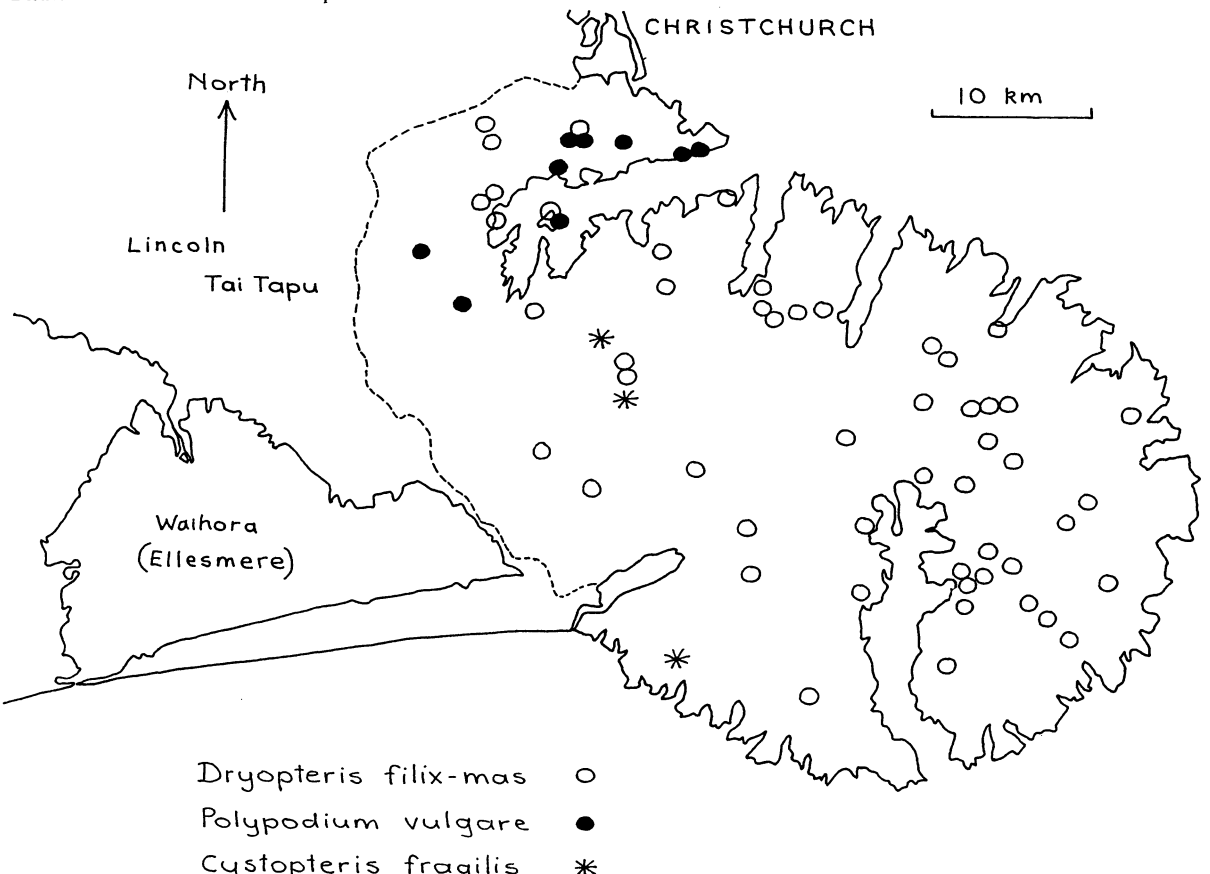
(c) Naturalised species	Footnote	Abundance	Main Habitat
* *Adiantum capillus-veneris* maidenhair		6	-
* *Cystopteris fragilis* brittle bladder fern		3	F
* *Dryopteris filix-mas* male fern	18	3	F
* *Polypodium vulgare* common polypody	19	3	R
* *Pteris cretica*		6	-

(d) Dubious records (evidence of current or past presence lacking; published records doubted)	Footnote
Adiantum aethiopicum maidenhair	20
A. hispidulum rosy maidenhair	21
Arthropteris tenella jointed fern	22
Blechnum durum	6
B. membranaceum	23
B. nigrum	24
B. triangularifolium Green Bay kiokio	25
Cyathea cunninghamii gully tree fern	26
Davallia dubia	27
Dicksonia lanata tuokura	28
Diplazium australe	29
Gleichenia dicarpa tangle fern	30
G. microphylla parasol fern	30
Grammitis ? givenii strap fern	31
G. patagonica strap fern	32
Hymenophyllum ferrugineum rusty filmy fern	33
H. lyallii filmy fern	33
H. pulcherrimum filmy fern	33
H. scabrum filmy fern	33
H. tunbridgense filmy fern	10
Lastreopsis microsora	34
Leptopteris superba Prince of Wales feathers	35
Microsorum scandens fragrant fern	36
Polystichum silvaticum	37
Schizaea dichotoma fan fern	38
Trichomanes colensoi	33
T. elongatum bristle fern	33

Notes

1. *Adiantum fulvum*. Banks Peninsula is the type locality for this species, collected and described by Raoul (1846). Later, other field workers recorded it. Laing (1919) listed it for Charteris Bay. He commented "Evidently by no means common." There is an undated specimen of T. Kirk (CHR 291 744) at Lincoln, from Akaroa. During my fieldwork I searched for the species without success, although I note "one plant from near Le Bons lighthouse appears some what intermediate between *cunninghamii* and *fulvum*." *A. fulvum* could persist on Banks Peninsula and we should keep looking for it. It is readily distinguished from *A. cunninghamii* by its hairy stipes, rachises and lamina undersurfaces (Brownsey and Smith-Dodsworth 1989).

Fig. 4. Distribution of three naturalised fern species on Banks Peninsula.



2. *Asplenium appendiculatum*. Earlier known as *A. terrestre*. There are two subspecies on Banks Peninsula, the widespread subsp. *appendiculatum* and the coastal subsp. *maritimum* (see Brownsey 1999).

3. *Asplenium bulbiferum*. Two subspecies (Brownsey 1977a; Brownsey and Smith-Dodsworth 1989), treated by some botanists as distinct species (see Ogle 1987) occur on Banks Peninsula. They are not easy to distinguish in the field, but both appear to be common, with subsp. *bulbiferum* favouring damp forested gullies and stream-sides, and subsp. *gracillimum* in drier forest sites.

4. *Asplenium hookerianum*. Very variable on Banks Peninsula, as elsewhere. Ericson (1990) was convinced that an extreme form at Onuku near Akaroa should be regarded as a distinct species. Lovis (1990) commented, concluding that none of the variable forms was reproductively isolated from the others.

5. *Asplenium polyodon*. Recorded by Armstrong (1880) (as *A. falcatum*). Currently known on Banks Peninsula from one clump only, growing on steep rock in scrub near Stony Beach, between Little Akaloa and Okains Bay.

6. *Blechnum blechnoides*. Earlier known as *B. banksii*. Chambers and Farrant (1996) comment that New Zealand *B. blechnoides* shows considerable variability, but that the smallest specimens seen are from Banks Peninsula. In fact there are large forms here too, the largest resembling *B. durum* which some workers have recorded from the Peninsula. Armstrong (1880) (as *Lomaria banksii* and *L. rigida*) and Mason (1969) record both species. Field evidence both here and on Stewart Island strongly suggests to me that *B. blechnoides* and *B durum* are habitat forms of one species, the former from coastal rocks, the latter from deeper, peatier soils which may be (and often are) adjacent. The name *blechnoides* has precedence.

7. *Blechnum* sp. "N.Z. minus". Chambers and Farrant (1998) incline to the view that New Zealand swamp kiokio is not identical with the Australian *B. minus* but is rather a form of *B. novae-zelandiae* resulting from a response to swampy conditions. Field evidence on Banks Peninsula suggests rather that swamp kiokio and *B. novae-zelandiae* are distinct at species level, and that well-grown specimens of both maintain consistent differences, e.g. the pale brown concolorous scales of swamp kiokio (comparable with those of Australian *B. minus*) in contrast to the distinctive "black spot" scales of *B. novae-zelandiae*. In addition, differences in habit and texture remain distinct even in well-grown plants of both species; e.g. the very long, harsh-textured fronds of *B. novae-zelandiae* arch and droop, while the thinner textured fronds of swamp kiokio, even at their greatest development, are much straighter and more upright, as well as being a lighter, yellower green.

8. *Cystopteris tasmanica*. Known only from the head of Orton Bradley Valley on Mt Herbert (Fig. 1), this species was recorded by Armstrong (1880) under his superfluous name *C. novae-zelandiae*, but confirmed only recently by one collection made on my survey, and by a much more adequate fertile specimen collected by Susan Wiser in 1999. The naturalised *C. fragilis* is locally common at several sites on the Peninsula (Fig. 4).

9. *Grammitis magellanica*. The subspecies present on Banks Peninsula is subsp. *nothofageti*. Parris and Given (1976) cite a specimen from the south side of Lavericks Peak collected by Given in 1971.

10. *Hymenophyllum*. Earlier observers recorded *H. tunbridgense* (e.g. Armstrong 1880, Laing 1919, Wall 1918, 1953). New Zealand species which would have been referred to by this name are now recognised as *H. cupressiforme, H. peltatum* and *H. revolutum*, of which the first two are currently known from Banks Peninsula.

11. *Hymenophyllum dilatatum*. Armstrong (1880) recorded this species for Banks Peninsula, and Potts (1882) recorded it for "Ohinitahi, Lyttelton Harbour", but until its rediscovery by John Lovis and Martin Daellenbach (Lovis & Daellenbach 1982b) in May 1982 there was no specimen known of this fern from Banks Peninsula. Lovis and Daellenbach deposited a voucher at CHR "in order that future generations shall not view our record with the same scepticism as some have tended to regard those of Potts, Armstrong and Riches".

    In December 1986 (Wilson 1987) I discovered "deep in the damp mysterious heart of Carews Peak Scenic Reserve on the south side of the Peninsula, a further patch of this splendid filmy fern '... several hundred fronds draping tree fern trunks and sprawling luxuriantly along the top of a waterfall".

12. *Hymenophyllum malingii*. No specimens of this distinctive filmy fern are known from Banks Peninsula. Laing (1919) could not confirm earlier records but included it in his careful listing "on the evidence of others" (namely Potts and Armstrong). On similar evidence Laing also included *Hymenophyllum atrovirens* (as *H. australe*), *H. dilatatum* (see above), *H. demissum, H. minimum* and *H. bivalve*, all of which are now known to occur on Banks Peninsula. Accordingly, I list this species as a probably genuine record, and with the hope that it might also be rediscovered.

13. *Hymenophyllum sanguinolentum* and *H. villosum*. Various authors (e.g. Brownsey & Smith-Dodsworth 1989), comment on the close relationship between these two species, hinting that *H. villosum* might be just a higher altitude form with much narrower ultimate segments, much hairier stipes, rachises and laminae, and without crests on the back of the indusial flaps. Interestingly, on Banks Peninsula and in other parts of Canterbury they appear to be further distinguished by chromosome number. Dawson *et al.* (2000) provide chromosome counts for *sanguinolentum* from other parts of New Zealand as n = 34 (-36), but all eight counts listed for *sanguinolentum* in Canterbury, including six from Banks Peninsula, give n = 66 – 70 – (72). Nine counts for *villosum* from sites within and outside Canterbury give n = 34 (c. 34) (36). From one locality on Banks Peninsula (Otepatotu Reserve), *H. sanguinolentum* was counted as n = 66 – 70, and *H. villosum* as n = c. 34. In the same paper Lovis provides a previously unpublished count of hybrid *sanguinolentum* x *villosum* from Canterbury (Grey River, Mount Grey Forest), reporting irregular pairing at meiosis.

14. *Hypolepis distans*. Occurrence on Banks Peninsula is based on a single collection from Akaroa by W. Martin (Brownsey & Chinnock 1984). This is quite widely disjunct from the rest of its distribution in the South Island which is the Marlborough Sounds, north-west Nelson and northern Westland, but another occurrence on Stewart Island (Brownsey & Chinnock 1984; Wilson 1982) is even further disjunct. Armstrong (1870) and Armstrong (1880) both list it for Banks Peninsula.

15. *Pteris macilenta*. Allan (1961) notes "also recorded for Banks Peninsula, not listed by Martin", and at least in the sixth edition of Crookes & Dobbie (1963) the comment is repeated "also said to occur on Banks Peninsula". John Thompson (1979) reported *P macilenta* at Governors Bay, and I also encountered the species at Governors Bay in January 1988, writing in my field notebook "as if completely wild, bank by small seepage with *Blechnum minus, Polystichum richardii*, under mahoe, fuchsia, fivefinger and red mapou. By coastal road. Could have escaped from cultivation I suppose!". In the meantime I tentatively accept it as part of the wild native flora. Voucher specimen is lodged at CHR.

16. *Sticherus cunninghamii*. Laing (1919) cites records by J.B. Armstrong and T.H. Potts, refers to a record by W. Martin behind Le Bons Bay, and notes a locality at about 2000 ft at Port Levy, on Pigeon Bay side of valley, "but now extinct in this locality". Currently I know of three localities on Banks Peninsula (Fig. 1).

17. *Trichomanes endlicherianum*. Crookes & Dobbie (1963) include Banks Peninsula in the distribution of this species, probably based on J.B. Armstrong's (1880) record (as *T. humile*). I found one location only for the species (Fig. 1) in the heart of Peraki Saddle Scenic Reserve, under damp, deeply shaded overhanging rock along a forested stream, a habitat characteristic of this tiny filmy fern.

18. *Dryopteris filix-mas*. This naturalised Northern Hemisphere fern is now widespread across the Peninsula (Fig. 4) and increasing. Several other species in the same family (Dryopteridaceae) are naturalised in Christchurch city (Lovis 1980a) but are not yet recorded from the Peninsula (*D. affinis, D. dilatata* and *Athyrium filix-femina*); it is probably only a matter of time before they are found to be spreading into the hills.

19. *Polypodium vulgare*. To date the Port Hills and Quail Island are the only known New Zealand localities for this European and Asian species. Lovis (1980b) notes its discovery by Yvonne Elder and John Thompson between 1966 and 1973, and its apparent spread in the following decade. Since 1980 it has continued to spread right along the Port Hills (and on to Quail Island) (Fig. 4).

20 *Adiantum aethiopicum*. Reported from Akaroa by Raoul, but possibly collected by him in the Bay of Islands; there is good evidence that a few of his collections were mislabelled in regard to location. Raoul's record was probably the basis for Armstrong's (1880) listing (as *A. assimile*). Martin (1920) also included it but with some doubt.

21. *Adiantum hispidulum*. Reported only by Armstrong (1880), not confirmed by later workers. Current southern limit appears to be southern North Island (Brownsey & Smith-Dodsworth 1989).

22. *Arthropteris tenella*. Reported by Armstrong (1880). Crookes & Dobbie (1963) cite Banks Peninsula. Allan (1961) says "Also on Banks Peninsula, but not seen there of late". Current known southern limit appears to be Marlborough Sounds and north-west Nelson.

23. *Blechnum membranaceum*. Reported by Armstrong (1880), Potts (1882), Cockayne (1915), Wall (1918; 1953) and Laing (1919). Brownsey & Smith-Dodsworth (1989) note "extending to a few east coast localities as far south as Banks Peninsula". I am convinced that *membranaceum*-like plants on Banks Peninsula are merely small forms of *B. chambersii*.

24. *Blechnum nigrum*. Reported only by Armstrong (1880). Current known distribution in the South Island is strictly in the far west, although its presence on Banks Peninsula is not wholly unlikely.

25. *Blechnum triangularifolium*. Chambers & Farrant (1998) show Banks Peninsula on their distribution map for this species, but this appears to be a misreading of a herbarium label "coast north of Banks Peninsula".

26. *Cyathea cunninghamii*. Wall (1918) lists it with a query, from the southern end of the Port Hills: "Like *dealbata* but lacking white or silvery underside to frond". Laing (1919) and Martin (1963) also listed it for Banks Peninsula. Its presence on Banks Peninsula is unlikely.

27. *Davallia dubia*. Reported by Armstrong (1880, 1881) (as *Dennstaedtia dubia*). Listed in Brownsey *et al.* (1985) as a species erroneously or dubiously recorded for New Zealand.

28. *Dicksonia lanata*. Reported by Armstrong (1880) and repeated in Crookes & Dobbie (1963), almost certainly in error.

29. *Diplazium australe*. Martin (1963) claimed Banks Peninsula as a southern limit record for this species (as *Athyrium australe*). He possibly confused it with the naturalised *Dryopteris dilatata*, which is in the same family (Dryopteridaceae) although with differently shaped indusia. *D. dilatata* was known from the banks of the Avon River and from Riccarton Bush by the late 1970s

(Lovis 1980a), but so far as I know has not yet been seen on Banks Peninsula. The currently known distribution of *Diplazium australe* in the South Island is the Marlborough Sounds and southwards down the West Coast to Greymouth.

30. *Gleichenia dicarpa* and *G. microphylla.* Both were recorded for Banks Peninsula by Armstrong (1880), with the comment "comparatively rare in Canterbury". Their occurrence here is unlikely; both prefer nutrient-poor, wet, acid soils unknown on the Peninsula.

31. *Grammitis* ? *givenii.* Reported by Wilson (1992) on the basis of one collection from rocky snow tussockland at 750 m near Trig W. close to Bossu Road, October 1984. Field notes say "no stipe hairs, stipe not very distinct, creeping, sori several pairs in upper half of frond, running together". The record needs further checking.

32. *Grammitis patagonica.* Thompson (1979) states: "Dr Given informs me that in March last Mr Tony Huber noticed *Grammitis patagonica* growing on a cliff face near Coopers Knob". The record needs further checking.

33. Filmy ferns (*Hymenophyllum* and *Trichomanes*). Armstrong (1880) listed 19 species of filmy fern from Banks Peninsula. Many of these records were doubted by later botanists, but all but six or seven (see also *Hymenophyllum malingii*, footnote 12) have now been verified. The six species in List (d) must be regarded as dubious records, but on the basis of recent filmy fern discoveries on Banks Peninsula (see especially Lovis & Daellenbach 1982a and b) none can be rejected outright. The current known distribution of *Hymenophyllum ferrugineum, H. lyallii* and *Trichomanes elongatum* in the South Island, however, appears to be strictly western.

34. *Lastreopsis microsora.* Recorded by J.F. Armstrong (1870) for the Port Hills (as *Nephrodium decompositum*) but J.B. Armstrong (1880) lists only the three species of *Lastreopsis* currently known to occur on the Peninsula: *glabella, hispida* and *velutina.* The presence of *L. microsora* here is not too unlikely, although Brownsey & Smith-Dodsworth (1989) note that it is "very local in coastal regions of the South Island reaching north Westland and Dunedin".

35. *Leptopteris superba.* Armstrong (1880) listed both *L. hymenophylloides* (as *Todea hymenophylloides*) and *L. superba* (as *T. superba*), for Banks Peninsula. *L. hymenophylloides* is common here, but the presence of *L. superba* has never been verified and is most unlikely – the fern requires constant high humidity and lacks resilience against the sort of periodic droughts to which nowhere on Banks Peninsula is entirely immune.

36. *Microsorum scandens* and *M. pustulatum.* Although the nomenclatural history of these species is a maze, Armstrong (1880) listed both *Phymatodes billardierei* and *P. pustulata*, meaning respectively *M. pustulatum* (= *Phymatosorus diversifolius*) and *M. scandens* (= *Phymatosorus scandens*). *M. pustulatum* is abundant on Banks Peninsula, but the presence of *M. scandens* is unconfirmed, and certainly I never encountered it during my fieldwork. Brownsey & Smith-Dodsworth (1989) note that it is "rare on the east coast of both islands" while common in the west to about as far south as Franz Josef. Laing (1919) lists *Phymatodes pustulata*, probably meaning *Microsorum scandens*, and gives: "Akaroa, Raoul. Catons Bay, Lake Forsyth. R.M.L.". In April 1988 I saw a specimen of *M. scandens* growing in Arthur Ericson's fernery in Akaroa, which Arthur said (but with some doubt) came from Saddle Hill, above Wainui, Banks Peninsula. Thus it is possible that *M. scandens* was, and perhaps still is, represented on Banks Peninsula.

37. *Polystichum silvaticum.* Kelly (1972) writes of Wainui Scenic Reserve "The reserve ... includes what appears to be the small shield fern, *Polystichum silvaticum.* If so, it is the only place I have seen it on the Peninsula.". I have found nothing on Banks Peninsula that I would confidently assign to *P. silvaticum.* Brownsey & Smith-Dodsworth (1989) comment of its South Island distribution "recorded only from north-west Nelson, the Marlborough Sounds and Dunedin".

38. *Schizaea dichotoma*. Reported by Armstrong (1880). A highly unlikely record. Current distribution in New Zealand is the northern North Island and around thermal sites in the Rotorua/Taupo area (Brownsey & Smith-Dodsworth 1989).

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