members of ABS on that trip and we stayed at four different locations. For me the highlights of the New Caledonian flora were the 18 species in the family Araucariaceae: 5 species of kauri (*Agathis*) (Fig. 4), and 13 *Araucaria* species, all endemic to New Caledonia, *Amborella trichopoda*, a very primitive angiosperm (Fig. 5), *Xeronema mooreii* with beautiful spikes of flowers, and the very strange looking parasitic podocarp, *Parasitaxus ustus* (Wilcox 2004).

Fig. 5. *Amborella trichopoda*, Plateau de Dogny, New Caledonia, 2 Dec 2003.

Fig. 6. Prostrate *Hebe chathamica*, Kaingaroa, Chatham Island, 5 Jan 2007.

The Chatham Islands was another unique place to visit. There have been two visits here for ABS members and I was among the fortunate 22 to visit in January 2007. We had very comfortable accommodation at Hotel Chatham, Waitangi, from where we were able to take day trips to various parts of the island, and a flight to Pitt Island. Apart from seeing many of the island's endemic plants (Fig. 6), the flight to Pitt Island and seeing from the air the protected islands of Mangere and Rangatira, as well as watching briefly the last resident black robin on Pitt Island, were particular delights (Young 2007).

All the other parts of the South Island that we have visited, namely Golden Bay, Lake Ohau, Kaikoura and southern Marlborough, Central Otago and most recently Arthur's Pass, have allowed us to see more endemic plants, and to enjoy great walks with congenial company. Without the excellent leadership and organisational skills of Maureen Young, Mike Wilcox, Sandra Jones, Cathy Jones and Anthony Wright these would not have occurred.

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Waitakere Ranges – a Botanical Inspiration

Sandra Jones

My talk was constructed from a personal perspective, concentrating on special plants of the Waitakeres - ones that excite and delight me, or those that have a special story attached to them. For this abridged version for the Journal, I have selected just a portion of the 85 species covered in my talk (Fig. 1).

MONOCOTYLEDONS

Orchids and a *Libertia*

I had read in a Bot Soc journal of a 1962 record of ***Adelopetalum tuberculatum*** on a fallen branch in the vicinity of Pukematekeo on Scenic Drive but it wasn't until 1994 when a big storm blew out the top

of a kahikatea (*Dacrycarpus dacrydioides*), which took two large side branches with it and dumped them beside a walking track on the flat near the Waitakere Stream, that I saw it for myself. By the time I heard about the find (from Alan Ducker) and went to view the plants, they were already quite shrivelled so they wouldn't have lasted much longer. Now I can't even find the branches. More recently, Ark in the Park volunteers found another very sickly-looking colony on a dead trunk in the same general area, on the edge of open swampy ground and Jeff McCauley found many plants there fallen from a kahikatea in 2008 (herbarium voucher AK 303407). As far as I'm aware the only other place that it has been recorded is at the very opposite end of the Ranges, in a Titirangi reserve next to where I lived, shown to me by Stephen King, high up on branches of an old kahikatea where only he would venture.

Danhatchia australis has been found in the Waitakeres, as far as I know, only in one small area in a taraire (*Beilschmiedia tarairi*) remnant on Lone Kauri Road. It has become something of a pilgrimage for me to revisit the site every few years and I have a couple of precious photos of Dan Hatch and *Danhatchia*, taken at the site in December 2000 (Fig. 2). Dan lived in Laingholm for most of his long life, so it is very fitting that there is at least one colony of his name-sake in his home territory.

In 1983 I went to Spragg Bush with a small group of Bot Soccers to look at a ***Gastrodia minor*** (Fig. 3) that John Braggins had found there. It was under a closed canopy a few metres off the track. I have no idea how anyone could have spotted it; to me it looked like a small burnt stick, but I shared the excitement of the find anyway. I haven't seen it since, nor have I heard any further reports.

We had all read with great interest about Dorothy Cooper's discovery of a new species of orchid – ***Pterostylis cardiostigma –*** at Day's Bay in Wellington in 1983. But it wasn't until 1989, on a Bot Soc field trip to the Mt Donald McLean area, that Maureen Young identified several plants of this species, which had not previously been recorded north of Kawhia. It pops up here and there around the Ranges, but isn't common.

Bot Soc became particularly interested in the gumland remnants at Cornwallis in the early 1980s following a fire near Spragg Monument, and also made a submission in response to the Proposed Forest Park at Cornwallis in December 1981. Fortunately this proposal did not go ahead. Apart from the usual plants one might expect to find in gumlands, the most interesting feature, for me at least, are the orchids, particularly the *Thelymitra* species. ***Thelymitra carnea*** is a favourite of mine. Unfortunately for sun-loving species such as this, as the years march on, the open areas – the clay banks and the roadside verges – are being lost to regeneration and the character of the gumlands is slowly but surely changing. The orchids can still be found, but not in such numbers.

Libertia micrantha is known from a handful of sites at high altitudes, but my favourite is on the streamside in the Upper Nihotupu where it grows in some abundance.

FERNS

Ptisana salicina is now officially listed as being in decline in the Waitakeres although plants are popping up in settled areas like Titirangi – the progeny of garden specimens or is it simply the absence of pigs from such areas?

Dicksonia fibrosa has an odd distribution in the Ranges, with an old record from west of Titirangi, but more recently in a swampy area near Waiatarua, at Anawhata where we saw one about 1 m tall on a Bot Soc field trip in 1994, and a small group of three or four in the Upper Nihotupu area.

Asplenium hookerianum is a delicate fern, seldom seen, but it is scattered throughout the Ranges. It seems to like to snuggle up to above-ground roots and even to wooden steps. I've also seen it on black sand swale at Bethells/Te Henga.

I read somewhere that ***Blechnum vulcanicum*** was found in the early days beside the Opal Pools at Karekare, but the site was destroyed when Lone Kauri Road was built. However, a very small colony on a river bank near Huia still survives. ***Blechnum nigrum*** is apparently found in dark, damp forest along the highest parts of the Ranges but I have seen it only once.

Records exist for ***Botrychium australe*** (Figs. 4 & 5) from two areas: near Piha and in Goldie Bush. I haven't been able to relocate the latter, but I know the Piha one well. There is only one plant and it has existed here since at least 1984 to my knowledge when I was told of its presence by Alistair MacArthur. It is in a precarious position on a track side, surrounded by gravel.

Notogrammitis pseudociliata is usually a low epiphyte in 'montane' forest. I know it from a few sites, including one on a track where we were alerted by Barbara Parris to look out for it. She saw the species list for a Bot Soc field trip in advance and thought it seemed a likely place. She was quite right.

Tempted as I am to talk about a number of the twelve *Hymenophyllum* species that occur in the Ranges, I'll only mention one and that is ***Hymenophyllum armstrongii***. This species has tiny fronds and it occurs on high branches among

Fig. 1. Sandra Jones speaking at the Symposium. Photo: Philip Moll, 27 Oct 2012.

Fig. 2. *Danhatchia australis*, Karekare. Photo: S. Jones, 28 Dec 2000.

Fig. 3. *Gastrodia minor*, unopen flower, Spragg Bush. Photo: S. Jones, 4 Dec 1983.

Fig. 4. *Botrychium australe*, sterile frond, Piha. Photo: S. Jones, 3 Mar 1985.

Fig. 5. *Botrychium australe*, fertile frond, Piha. Photo: S. Jones, 3 Mar 1985.

Fig. 6. *Corokia* hybrid, Huia. Photo: S. Jones, 10 Aug 2012.

Fig. 7. *Pimelea tomentosa*, Te Henga. Photo: S. Jones, 20 Sep 2008.

Fig. 8. *Pimelea tomentosa* Te Henga. Photo: G. Silvester, 20 Sep 2008.

Fig. 9. *Sophora fulvida*, Karekare. Photo: S. Jones, 15 Nov 2008.

Fig. 10. *Hebe obtusata*, Anawhata. Photo: S. Jones, 18 Apr 2008.

Fig. 11. *Metrosideros carminea*, Karekare Road. Photo: S. Jones, 15 Sep 2009.

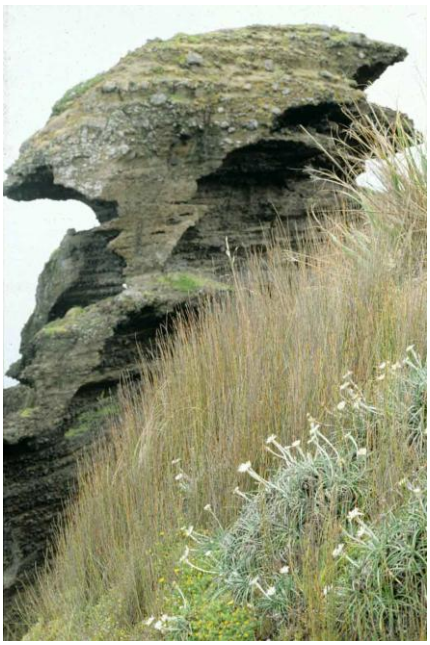

Fig. 12. *Celmisia major*, coastal cliffs on Taitomo I., south Piha. Photo: E. Cameron, 29 Dec 1993.

mosses and liverworts, so it's seldom seen. I've seen it twice, both times on branches fallen from forest giants.

Doodia mollis isn't a common fern of the Ranges, but it does pop up in a few very different habitats, often associated with *D. australis,* from Bethells Valley in the north, to the Manukau Harbour in the south, and a few points in between.

Lindsaea viridis is one of our most uncommon ferns, preferring wet places in beds of moss. I have seen a few plants only, on a creek in the eastern foothills and on a stream near Muriwai.

There are four fern species that thrive in the harsh salty environment along the coast, none particularly common. ***Blechnum blechnoides*** is truly coastal, generally surviving within reach of salt spray. ***Blechnum triangularifolium*****,** before it was formally described in 1998 and recognised as a relatively wide-spread species, was known by its tag name *B.* "Green Bay", so it has a special place in our westie hearts and minds. ***Asplenium northlandicum*** and ***A. appendiculatum*** **subsp. *maritimum*** are the other two species.

In 1985 I found a patch of several hundred tiny plants of the adder fern ***Ophioglossum coriaceum*** on thin, mossy soil on damp rocks at Anawhata. It has proved elusive in recent years.

I well-remember the amazement when we found a single plant of ***Psilotum nudum*** at Whatipu on a Bot Soc field trip in 1998, on black sand on the edge of scrubland next to the open beach. As far as I'm aware, this was the first sighting in the Waitakeres, but a few years later it started turning up in various places around Titirangi and Laingholm, on artificial rock walls, and in bark gardens.

GYMNOSPERMS

We have lots of wonderful podocarps but a relatively small number of species, two of which are rare in the Ranges. ***Halocarpus kirkii*** is confined to two colonies, one in the Nihotupu water catchment and another in the eastern foothills. One tree of ***Manoao colensoi*** occurs in the vicinity of Mt Donald McLean; the only other known specimen in the area died a number of years ago. Another couple of silver pines and seedlings occur close to the *H. kirkii* in the foothills, and there were also reports from the Huia Valley in 1965, before the dam was built. These are presumed drowned.

DICOTYLEDONS

Trees & terrestrial shrubs

Nestegis cunninghamii is scattered around in small numbers. Keep an eye open as you walk along for trunks with large insect holes. If it's not a puriri, it probably will be black maire.

Pseudowintera axillaris has been recorded from a few localities spread across the Ranges, from Donald McLean ridge in the south, to the Waitakere Dam in the north. Two trees of a mystery *Pseudowintera* grow in the forest near the now-dry Upper Nihotupu Auxiliary Reservoir. Because it has black fruit, it was assumed by some of us to be the mountain horopito ***P. colorata -*** the really hot one. And I tried it to taste – much hotter (after half a minute) than the *P. axillaris* leaves I've tried from elsewhere in the Waitakeres. However Peter de Lange looked at these recently when he was working on describing the new species *P. insperata* and has confirmed that the two odd trees in the Upper Nihotupu area are actually of hybrid origin. It's a bit more complicated than this, but that's a story for another day.

A few trees of ***Elaeocarpus hookerianus*** are known in the vicinity of Titirangi, and small stands of hard beech (***Nothofagus truncata***) have been found in pockets along the eastern foothills, particularly near Titirangi, and in the upper reaches of the Whatipu stream catchment. ***Pennantia corymbosa*** is actually not as rare in the Ranges as it was once thought to be. Over recent years mature trees, juveniles and seedlings have been found in almost every catchment, from Titirangi in the south to Muriwai in the north.

A population of ***Melicytus lanceolatus*** has found a niche for itself in sunny open spots on a small section of the Piha Road. There is strong suspicion that some unusual, localised species may have been introduced, either accidentally or on purpose, during the timber milling days, or even more recently, and have now naturalised; *M. lanceolatus* is one of these.

There is only one species of tree or shrub that is still considered to be truly endemic to the Waitakeres and that is ***Hebe bishopiana***. For many years there was much discussion about whether it was a hybrid or a true species. In 1926, Petrie identified it as a hybrid between *H. stricta* and *H. obtusata*, but in 1966 Dan Hatch reported in the Bot Soc Newsletter that a specimen in his Laingholm garden threw young plants which appeared to be true to type in every respect. Eventually, in 1996, Peter de Lange published an article in the *NZ Journal of Botany* supporting Dan's suggestion that it was indeed a true species. The type specimen was taken from Mt Donald McLean where, just a year later, roadside gorse spray contractors killed a number of plants – up to 300, according to an item in the *Western Leader* which featured Bot Soc member Anne Grace.

Small-leaved shrubs are a feature of our forests and include ***Raukaua anomalus***, ***Melicytus micranthus*** and ***Melicope simplex***. Juvenile

Streblus heterophyllus and ***Pennantia corymbosa*** also fall into the 'small-leaved' category though their adult leaves are considerably larger. Small-leaved shrubs and trees are also a feature of our coastal forest, such as ***Myrsine divaricata***, ***Lophomyrtus obcordata*** and ***Corokia cotoneaster*** which is predominantly a coastal forest plant in the Waitakeres, but its relative, ***C. buddleioides,*** in my experience prefers kauri forest. Where they meet, as they do high above Little Huia, they may hybridise as in this photo (Fig. 6).

A long time ago I was shown a few plants of ***Pimelea tomentosa*** (Figs. 7 & 8) at Te Henga by Anthony Wright who had discovered this remnant population in 1977. When I went back to look for it in 2008 I had a clear picture in my head of where to look. My memory was that we had bush-crashed, up a bit of a slope behind a low bare cliff. So I sent Anne Grace crashing about in the scrub, getting torn to shreds by the *Gahnia* while I stood below shouting instructions and idly scanning the cliff face. You guessed it, there it was right in front of me. Either my memory failed me, or it had moved!

I've seen only a few ***Olearia albida*** around the Waitakeres including one familiar individual on Scenic Drive which was probably planted. The best natural colony that I know of, about 12 adults and 1 seedling, is on a rock outcrop above Whatipu.

A few species have their stronghold in the Ranges, although they also occur in small populations in other scattered localities. One of these is ***Sophora fulvida*** – the 'Anawhata kowhai'. It flowers later than the other local species and I swear that the flowers are shorter and fatter, but no one else I've spoken to can see it (Fig. 9). It is mostly coastal, but it does occur inland on rocky bluffs, for example at Waiatarua. Another is ***Hebe obtusata***, a very attractive sprawling shrub (Fig. 10). It was at one time believed that both these species were endemic to the Waitakeres, but in recent years the kowhai has been reported from sites between Maunganui Bluff and Raglan Harbour, and the hebe has been found to the south as far as Kawhia Harbour.

Epiphytic and parasitic shrubs

Ileostylus micranthus appears to grow almost exclusively on totara (*Podocarpus totara*) in the Waitakeres, with one exception (on *Coprosma grandifolia*) that I am aware of, although it has been recorded on many other hosts elsewhere.

One colony of ***Korthalsella salicornioides***, growing on manuka (*Leptospermum scoparium*), is known to still exist in the Ranges. Its apparent rarity may be partly due to the fact that it is small and insignificant, so that plants above eye level are out of sight and therefore overlooked.

Pittosporum kirkii is not often noticed because its natural habitat is high up in forest trees, but occasionally it comes down to earth on fallen branches where it may or may not die a quick death. I have also seen a specimen well-established on a *Cyathea dealbata*. It was at eye level when I first saw it, but now it is high overhead and not easy to spot even when you know where to look.

When the Nature Conservation Council's *Red Data Book* was published in 1981 ***Metrosideros carminea*** was listed as "Endangered". Since then it has been recorded from many sites all over the Ranges and elsewhere and is no longer considered to be threatened. It is often found scrambling over rock faces where it remains in its juvenile non-flowering form, so it is often dismissed in passing as *M. perforata*. My favourite is a specimen (Fig. 11) on the huge pohutukawa that leans horizontally across Karekare Road. I am forever amazed that Auckland Transport and its predecessors have resisted what must be an irresistible urge to chop the pohutukawa, or at least its branch, down.

The shiny leaves of the epiphyte ***Raukaua edgerleyi*** are the visual flags for this species. Again, occasional terrestrial examples make close encounters possible. A small compact tree on Scenic Drive was just about stripped bare by possums about 25 years ago and I was sure it would die but it recovered well and is still looking healthy. Hooks or spines along the midribs of leaves on some plants were noted by Andrew Dakin in the Hunuas in the 1975 Bot Soc *Newsletter*. Similar specimens have been found in the vicinity of Mt Donald McLean.

Coastal herbs and one low shrub

Although the west coast has been subjected to gross habitat disturbance which has resulted in invasion by weeds, especially aggressive grass species, there is still much of interest to be found.

Celmisia major **var.** ***major*** (Fig. 12) is our wonderful *Celmisia* that flowers so beautifully on coastal cliffs. ***Coprosma acerosa*** is officially listed as being "in serious decline" though I believe this species is being planted at various places along the west coast. The sand gunnera, ***Gunnera dentata***, which is recorded under the name *G. arenaria* in Flora Vol. 1, occurs on sand flats at Bethells/Te Henga. Cheeseman made the first collection here, and it is the type locality. However *G. arenaria* has since been placed in synonomy with *G. dentata* in the Flora Vol. IV because although it was accepted by Allen in Vol. I as a distinct coastal species, it can't be distinguished by leaf or fruit characters from forms found within inland populations of *G. dentata*. ***Linum monogynum***, with its large pure white flowers and blue-grey leaves is altogether a lovely

plant that I've only seen at Te Henga and Mercer Bay. Bec Stanley undertook a survey for ***Myosotis petiolata*** **var.** ***pansa*** along the west coast of the Waitakeres in 2004 and found 22 sites with 548 plants in total – clearly not as rare as we had initially assumed. I've seen the sand buttercup, ***Ranunculus acaulis*** only once, on a Bot Soc field trip in 1981 at Kakamatua . I live in hope of finding it again one day.

Auckland lichens

Dan Blanchon

Introduction

Lichens are often overlooked in ecological surveys, yet they have an essential part to play in ecosystems. Some lichen species are involved in the formation of the first soils on rocky substrates and subsequently aid in soil stabilization. Other lichen species contain cyanobacteria and can therefore fix atmospheric nitrogen, making them highly important in the nitrogen cycle of grassland and forest ecosystems. Lichens are also important habitat for invertebrates, which in turn are food for birds and reptiles. Most lichen species are sensitive to air pollution, and as a general rule, the more species of lichens in an area, the cleaner the air.

New Zealand has a particularly rich lichen flora, with 1799 taxa currently accepted (de Lange et al. 2012b), which is around 10% of the total lichen species recognized in the world (Galloway 2007). All New Zealand lichens are considered to be native, although many are also found in other parts of the world.

What do we know about lichens in Auckland?

There is actually a great deal of information available on the lichens of Auckland and Northland, but much of it is hidden away in old journals and newsletters, or unfortunately unpublished. Two of the most valuable sources of information, *Tane* and the *Auckland Botanical Society Journal*, are now available online.

Tane, the journal of the Auckland University Field Club, provides a rich resource of information about lichens in the upper North Island (Fig.1). The very first issue (as the "Field Club Record") records a short list of six lichens from the Huia Field Club camp (Butler 1948). This was followed by Chambers (1952), who discussed the bryophyte and lichen ecology at a site near Swanson, although only a handful of lichens were actually identified. The real strength of the articles in *Tane* is in the records of the lichens of offshore islands of the Hauraki Gulf, eastern Northland and the Bay of Plenty, with a series of articles by Glenys Hayward (under her former name Puch), Bruce Hayward, Anthony Wright and David Galloway. Species lists and descriptive accounts were provided for Whale Island (Puch 1971, 13 taxa); Red Mercury Island (Puch 1972, 29 species); parts of Great Barrier Island (Hayward & Hayward 1973, 40 species); Shoe Island and the Slipper group (Hayward & Hayward 1974a, 112 species); Great Mercury Island (Hayward et al 1976, 104 species); Moturoa Island group (Hayward & Wright 1977, 21 species); Hen Island (Hayward & Hayward 1978, 99 species); Cavalli Islands (Hayward & Hayward 1979, 85 species); Fanal Island (Wright et al. 1980, 58 species); eastern Bay of Islands (Hayward & Hayward 1980, 111 species); Cuvier Island (Hayward et al. 1981, 51 species), Rakitu Island (Hayward & Hayward 1982, 124 species); Chickens Islands (Hayward & Hayward 1984, 125 taxa); Whale (Motuhora) and Rurima Islands (Hayward & Hayward 1990, 144 and 47 species); Poor Knights Islands (Hayward & Wright 1991, 144 species); Ruamahua-iti (Hayward 1973, 35 species), and a comparison of part of Great Barrier Island, Red Mercury Island, Ruamahua-iti and Whale Island (Hayward & Hayward 1973b). A handful of lichens were recorded by Cameron (1999) for a rocky islet at Waikawau Bay, Coromandel Peninsula.

Detailed studies were done on the lichens on Kawerua, western Northland, with an initial list of 126 species (Hayward & Hayward 1974b) and an update to 174 species in 1991 (Hayward & Hayward 1991a). Permanent quadrats were also set up in the same area and monitored (Grace & Hayward 1978). Hayward et al. (1975) listed 107 species for the northern Coromandel Peninsula. Hayward & Hayward (1983) also provided a useful account of the common lichens of Auckland City.

Over the same time period as *Tane*, and carrying on to the present day, the *Auckland Botanical Society Journal* and occasional bulletins have continued to add to our knowledge of the lichens of the northern North Island (Fig. 1). The main contributors have been Mike Wilcox, Doug Rogan, Rick Kooperberg, Carol Elliott (Lockett), Glenys Hayward, Bruce Hayward, Dan Blanchon and Enid Asquith. The information published by the Auckland Botanical Society has complemented that published in *Tane*, plugging gaps in accounts of offshore islands and concentrating more on mainland sites. The tradition of elucidating the lichen floras of distant offshore