BANKS PENINSULA PLANTS – THREATS AND RESCUES

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A thousand years ago Banks Peninsula was forested from side to side and from top to bottom. It was home to countless birds that ranged in size from rifleman and rironiro to moa and giant eagle. It was the source of clear fast streams alive with fish and insects.

Today its native biodiversity is sadly diminished. Nevertheless, when I completed my 1983–1988 detailed botanical survey of Banks Peninsula, my regrets about eagles and parakeets and forests were tempered by a realization of how much biological wealth still remained. An extraordinary diversity of living things had survived all the vicissitudes of the last few centuries – the burning, the felling, the hunting, the introduction of grazing and predatory mammals, the invasion by avian, insect and plant competitors contending with the original inhabitants for food and living space. Despite everything, I thought, the Peninsula was still a richly diverse, extraordinarily beautiful and unique place.

To glance at the statistics of Banks Peninsula's native plants is both cheering and sobering. On the one hand we seem to have lost amazingly few plants outright. Indeed, one or two that we thought were locally extinct have recently been rediscovered (e.g. Head 2001). I estimate that human impact on the Peninsula has driven about 15–20 vascular plant species to local oblivion, out of a total vascular flora of around 550 species. On the other hand I estimate that some 42 species are regionally endangered or vulnerable (Table 1), and a further 52 I would subjectively class as rare. (To be fair, the rarity of some of these cannot be blamed on *Homo sapiens*).

The endangered, the vulnerable and the rare have all managed to survive so far. Here and now on Banks Peninsula, what threatens to push some of them off the edge or to greater rarity? Conversely, is anything happening to reverse some of the negative trends?

THE THREATS

1. Introduced plant-eating mammals

Most of Banks Peninsula's 100,000 ha is grazed by farm stock. Much of the local economy is based on sheep and cattle, to a lesser extent on deer, to a minor extent on goats, and to a tiny extent on llamas, ostriches and emus.

Wild possums, rabbits and hares are common and widespread, and feral goats are locally common. Perhaps the only native vegetation completely free of alien herbivorous vertebrates is the vegetation of vertical sea cliffs and offshore islets. Aquatic and tidal vegetation of Lake Forsyth and the sea coast is grazed by both native and naturalised birdlife.

Some terrestrial plant species are particularly vulnerable to grazing and browsing by introduced mammals. For example, possums cause widespread damage to fuchsia, fivefinger, cabbage trees and mistletoes, and can ringbark saplings of kānuka, *Coprosma*, wineberry, and even tōtara with their territorial bite markings. Cattle almost eliminate fivefinger, sevenfinger, māhoe, kawakawa, tree ferns, most ground ferns, *Astelia*, and a wide range of other trees, shrubs and herbaceous species that they find palatable wherever they have access. Sheep are less destructive, but can virtually eliminate a similar range of species from forest understoreys. Feral goats must be regarded as the most destructive of the mammalian browsers, finding a wide range of understorey species palatable as well as fatally ringbarking even mature trees.

Conversely, possums on Banks Peninsula seldom cause widespread defoliation of fuchsia, fivefinger and mistletoes as they are known to do in many parts of New Zealand. I believe this has to do with the close mosaic of vegetation on the Peninsula. Clover is a highly preferred item of possum diet; the animals hole up in bush patches or rocky ground but spend a lot of the night feeding on adjacent pasture, so that they tend not to hammer any native species to oblivion (although they certainly hammer individual trees).

Furthermore, some prominent native tree species are actually favoured by a moderate level of sheep grazing, in that the sheep constantly remove tall exotic grasses that would otherwise inhibit regeneration of browse tolerant kānuka, kōwhai, lacebark, ribbonwood, kaikōmako and tōtara. Ungrazed exotic grasses such as cocksfoot and Yorkshire fog can also smother and eliminate the smaller native tussocks and associated herbaceous species. Moderate sheep grazing maintains the short tussock, although some of the native species (such as native anise) are graze-vulnerable and are eliminated from all but steep, inaccessible sites. Nor does grazing prevent the eventual replacement of the tussock by shrubs and trees (although repeated burning does).

2. Fire

Very little of Banks Peninsula – less than one percent of its area – has been untouched by fire during the last few centuries. Human-caused fires are responsible for reducing the old-growth forest cover from nearly 100 percent to about 0.8 percent. Some plant species are highly susceptible to destruction by fire. The most telling example in recent times was in 1984 when one out-of-control burnoff crossed into Armstrong Reserve, killing in one fell swoop some 400 cedar saplings, around three quarters of all the surviving cedar on the Peninsula (Norton and Molloy 1986). Other species vulnerable to fire include kahikatea, rimu and miro. Kānuka, which burns readily, is adapted for rapid regeneration after fire and owes its huge increase in abundance to human-caused burning. Tōtara is fire-resistant to some extent – even trees that are almost completely burnt can resprout and recover. Similarly, charred trunks on existing old-growth beech forest show that in at least some circumstances beech can survive burning. It also regenerates well after fire if seed sources persist nearby.

Many native hardwoods are fire-retardant. I have watched fire burning fiercely through gorse, for example, only to run up against regenerated native hardwoods and go out. In particular, ngaio, fuchsia, fivefinger, māhoe, karamū and wineberry make good fire-extinguishers.

3. Herbicides

Unfortunate damage continues on Banks Peninsula from careless use of herbicides. In a sometimes frantic and often futile attempt to curb the spread of gorse and broom on difficult marginal country, thousands of native shrubs and trees are killed each year. Numerous native trees have been destroyed even along the edges of Hinewai Reserve, casualties of helicopter spraying by neighbours who, otherwise friendly and benign, see the killing of gorse, even if only temporarily, as Priority Number One. Rare species (e.g. shining broadleaf) have been among the victims.

4. Plantation forestry

When I completed fieldwork for my botanical survey of Banks Peninsula in the late 1980s, exotic plantation (nearly all *Pinus radiata*) occupied about 1.7 percent of the Peninsula's 100,000 ha. This area has probably doubled now, and is likely to reach 10 percent of the Peninsula by 2020 if present trends continue. *Pinus radiata* is still overwhelmingly the most-planted species, but there is increasing use of cypresses and some planting of hardwoods such as blackwood and eucalypts.

Valuable economic crop though it is, *Pinus radiata* is, in my opinion, among the top conservation weeds on Banks Peninsula. It is now irretrievably part of the ecosystem. Fortunately it is intolerant of shade and is unable to regenerate under its own or other shade. This means two things. It doesn't invade intact native forest or closed-canopy scrub. And long-term, if not logged or burned, the pines would give way to shade-tolerant vegetation regenerating beneath. But it is long-term! *Pinus radiata* is an effective coloniser, fast-growing, long-lived, able to outcompete native colonising species (and gorse) on freshly bared surfaces, and able to invade more open vegetation such as tussockland, shrubland, bluff and dune communities.

On Hinewai, we logged an 11 ha plantation of mature *Pinus radiata* in the summer of 1997–98. To eliminate a second generation of pines on the site has involved a sustained effort, requiring the removal of tens of thousands of pine seedlings and saplings that would have kept their heads above otherwise vigorously regenerating gorse and natives.

Clearly, much of the land on Banks Peninsula now planted in exotic pines will not carry native canopy again for the foreseeable future. On the other hand, much of the pine forest will support an ungrazed, shade-tolerant native understorey along with significant populations of native birds and invertebrates. Fortunately too, cypresses, blackwoods and eucalypts have so far shown themselves to be far less guilty of aggressive spread than pines.

Unfortunately, increasing interest in Douglas fir (*Pseudotsuga menziesii*) means that this very tall, shade-tolerant conifer may well become a serious conservation weed here. It is readily spread by wind and, unlike pine, can invade more or less closed-canopy forest. To date, however, it has not been noted as wild.

5. Genetic pollution

Introduction of plants native to other parts of New Zealand that are foreign to Banks Peninsula, but in some cases closely related to indigenous Banks Peninsula flora, represent a threat that seems pedantic to some people, but is increasingly recognised as a serious issue. Good old Nelson botanist Shannel Courtney came up with an apt analogy: the native flora of an area – its unique gene pool, its dynamic interactions, its extraordinarily subtle patterns – tell a wonderful story if we can read it clearly. Introducing foreign but related plants is like randomly inserting meaningless letters and words into a book. We can probably still understand it, but it becomes increasingly difficult to read clearly; it blurs and obscures the meaning; it spoils a good story.

In this sense, it is worse introducing, say, the North Island form of *Olearia paniculata* which is distinctly different but can exchange genes easily with the local race, than it is introducing, say, pōhutukawa, which has no close relatives on Banks Peninsula. At least in the future we have a good chance of knowing that pōhutukawa is a foreign introduction. Let's hope that in the meantime it doesn't crowd out the unique mix of local species that forms Banks Peninsula's own coastal forest – what precious little is left of it.

It is difficult to convince people not to introduce "foreign natives" into their gardens – although their genes can readily escape over the garden fence. Hopefully, it is becoming easier to convince people that they really must not even contemplate putting anything except strictly local stock into conservation and ecological restoration projects.

6. Invasive weeds, predators and diseases

Out of some 500 more or less naturalised exotic vascular plant species on Banks Peninsula, surprisingly few are seriously competing against any of the 540 native vascular plant species (Wilson 1999). In my opinion the most threatening exotics currently established here are: *Acer pseudoplatanus* (sycamore maple), *Clematis vitalba* (old man's beard clematis), *Pinus radiata* (Monterey pine), *Tradescantia fluminensis* (wandering jew), *Passiflora pinnatistipula* (passionfruit), *Passiflora mollissima* (banana passionfruit), *Lonicera japonica* (Japanese honeysuckle), *Berberis glaucocarpa* (barberry) and *Berberis darwinii* (Darwin's barberry). I would be anxious about another 40 or so. Not helping anxiety levels is the realization that species not currently naturalised here are constantly appearing in the wild, many of them escapes from gardens or horticulture. We have reason enough to be worried about kiwifruit, pampas grass and wild ginger, for example, especially if global warming increases their competitiveness. Alas, it seems equally true that some attempts to "control" problem species without appreciating their ecology, too often backfire and make the problem worse. Weeds by their very nature thrive on disturbance.

So far the Peninsula has been pretty lucky about introduced invertebrate defoliators and diseases. Some native insects – especially the brown beetles that are adults of several species of grass grub – have become abnormally abundant because of the huge increase in grassland and decrease in woody vegetation. They can seriously defoliate,

sometimes kill, native trees and shrubs, although ecologically speaking the damage is seldom really significant. But just as with exotic plants, new exotic insects and fungi are arriving and establishing all the time. Establishment of something like the painted apple moth or the Asian gypsy moth is a constant and scary threat.

7. Road maintenance

In our society motorised vehicles appear to be given a priority that subordinates all other values (including human life of course – about 500 people are sacrificed on New Zealand roads each year, a tally apparently acceptable as the price of conveniently being able to drive to the dairy for a bottle of milk or a newspaper. On American roads, the equivalent of the Twin Towers terrorist attack death toll occurs every 4 weeks, on top of the accumulating environmental carnage, but few seem much concerned, least of all George Bush and the oil magnates).

On Banks Peninsula, as elsewhere in New Zealand, roadsides are potentially, sometimes actually, refugia for native plants and wildlife; some seriously rare things hang in there. Unfortunately their value in this respect is frequently eroded, not just because the roadsides are often grazed in times of feed shortages, such as drought, but also because the vegetation is regularly and crudely slashed back with rotary flails and sprayed with potent herbicides, chiefly so that cars need not be slowed down on corners or impeded in any natural way from getting from A to B in the fastest and least challenging way possible.

8. Off-road vehicles

The worst damage I have seen locally is to the sensitive and very special intertidal and dune vegetation of the Okains estuary and Kaitorete. These are not the only places threatened, but the whole issue makes me so angry I don't trust myself to come up with any cool or reasoned comment so I won't try.

9. Inappropriate development

Local and regional authority rules and restraints go some way to mitigating the effects of development on conservation values. But significant losses occur. Wetlands and saltmarshes are drained, fertilisers alter native soils and leach out into streams and lakes, native shrublands are cleared and converted to exotic pasture, gondolas are foisted onto reserve land that might have seemed safe, roads are straightened and widened, new buildings and gardens become yet more centres for the dispersal of invasive weeds – the list is long and dreary.

10. Global warming and climate change

The evidence that we are indeed conducting an unintended and dangerous experiment with the very systems that sustain us, seems pretty compelling to me. The worst-case scenarios make all other threats I've talked about look, if not insignificant, at least small-scale. No doubt Nature will work her way through this one, but we could damage ourselves and our cherished environment very badly along the way.

RESCUES

Nature is resilient. Conservation of native biodiversity on Banks Peninsula is largely a case of leaving Nature to get on with it, of realizing that we have bungled a lot, and of very carefully trying to mitigate our worst excesses. Fortunately, knowledge is increasing and attitudes are changing. Conservation initiatives on private land, for example, are increasing. Along with this comes a growing awareness that the Peninsula's unique life forms, communities and landscapes are not only intrinsically of enormous value, they can also sustain local livelihoods in ecologically benign ways.

I have to say that it is a source of enormous satisfaction to me that Hinewai Reserve, set up wholly for the conservation and restoration of native vegetation and wildlife in their own right, has also become a significant contributor to the local economy. Hinewai's role in the Banks Peninsula Track, for example, and its provision of walking opportunities and encounters with Nature for thousands of visitors to Akaroa, are subservient to our conservation goals but refreshingly productive nonetheless.

When the District Council tried to coerce farmers into conservation responsibility through the District Plan and the Resource Management Act, the farmers reacted strongly. Suggested rules and restrictions put landowners' backs up and generated a lot of heated debate. "Most of us are conservationists at heart" they retorted. "We will do the right things, but don't tell us what to do as if we are ignorant peasants! Consult, suggest, discuss, assist – but don't impose!" I saw a certain irony in this. I had been ordered for a decade and a half to clear gorse from Hinewai for farming reasons that were irrelevant on our side of the boundary fences! Nevertheless there is something very nice about Banks Peninsula's human community. They refused to be simply negative about all this. Landowners themselves put in hundreds of hours drafting variations to the District Plan and finding areas of agreement across a wide landscape of different opinions. That achieved, they set up a Conservation Trust, with Council backing, to promote awareness, share information, and help conservation initiatives on private land. There have already been some positive outcomes.

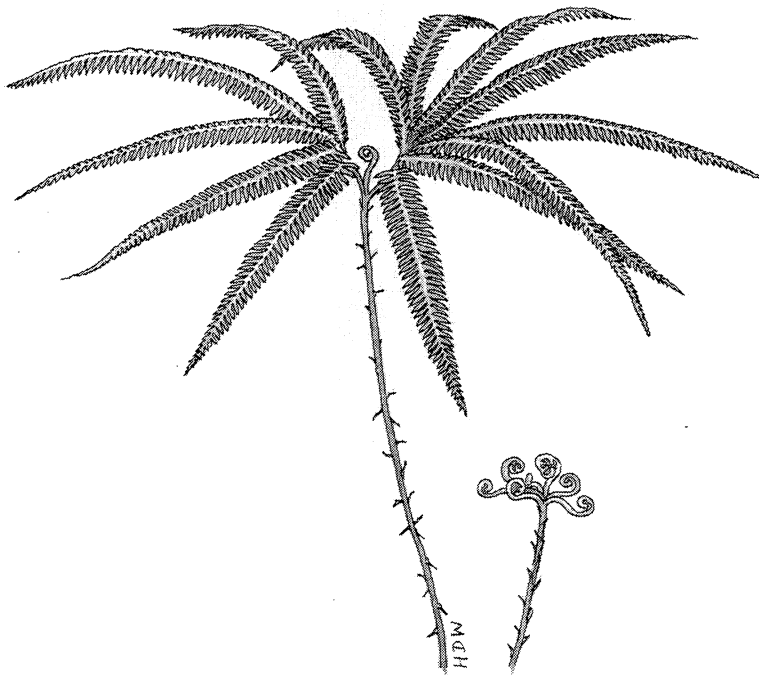
Here's another little bonfire of hope. I would be kidding you if I denied that Hinewai represents a bit of a struggle in gaining acceptance for our attitude to gorse on marginal land. Now, though, there really is increasing accord that in some situations gorse and broom are best managed as a nurse crop for natural forest regeneration, rather than targeted in futile and uneconomic attempts to wrest the occupied land back into pastoral farming. Yesterday I collected my mail from our rural postboxes up at the crossroads, and opened a farming newspaper to read the banner headline "Use marginal land for carbon credits". When Federated Farmers are urging landowners to leave their gorse-infested land to regenerate into native bush, helping to ease global warming and make some of their livelihood by doing so, I really do see considerable hope for Banks Peninsula's, and New Zealand's native biodiversity.

References

Head, Nicholas 2001: Rediscovery of Cook's scurvy grass (*Lepidium oleraceum*) on Banks Peninsula. *Canterbury Botanical Society Journal 35*: 43–47.

Norton, David; Molloy, Brian 1986: The ecology and management of kaikawaka (*Libocedrus bidwillii*) on Banks Peninsula – A progress report. *Canterbury Botanical Society Journal 20*: 7–12.

Wilson, Hugh D. 1999: Naturalised vascular plants on Banks Peninsula. *Canterbury Botanical Society Special Publication*. Christchurch, New Zealand. 51 pages.



Sticherus cunninghamii, umbrella fern.
Rare and local in Canterbury. (del. Hugh Wilson).

Table 1. Regionally endangered and vulnerable native vascular plant species – Banks Ecological Region

Species	Comment on status
Anarthropteris lanceolata	rare in Canterbury
Anemanthele lessoniana	rare in Canterbury
Asplenium polyodon	rare in Canterbury
Baumea rubiginosa	rare in Canterbury
Botrychium australe	
Botrychium biforme	
Brachyglottis bellidioides	
Bulbinella angustifolia	
Caladenia lyallii	U.K. *Stegostyla lyallii*
Carex appressa	rare in Canterbury
Carmichaelia kirkii	declining nationally
Clematis marata	
Coprosma acerosa	
Coprosma rugosa	
Dacrydium cupressinum	
Desmoschoenus spiralis	conservation dependent nationally
Dianella nigra	
Eleocharis gracilis	
Elymus multiflorus	
Epilobium macropus	
Gentiana grisebachii	
Hymenophyllum atrovirens	
Hymenophyllum cupressiforme	national status unknown
Hymenophyllum dilatatum	rare in Canterbury
Juncus caespiticius	
Lepidium oleraceum	endangered nationally
Leptinella nana	critically endangered nationally
Libocedrus bidwillii	
Lycopodium australianum	
Muehlenbeckia astonii	endangered nationally
Myosotis "australis var. *lytteltonensis"*	endangered nationally
Myrsine nummularia	
Olearia fimbriata	declining nationally
Pentachondra pumila	
Prumnopitys ferruginea	
Pteris macilenta	rare in Canterbury
Raoulia australis	abundant on adjacent Kaitorete
Raoulia hookeri	
Raoulia tenuicaulis	
Sticherus cunninghamii	rare in Canterbury
Thelymitra decora	
Trichomanes endlicherianum	rare in Canterbury