What's in *your* lawn?

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INTRODUCTION

When I lived in Otatara on the outskirts of Invercargill (1994–2005), I was surprised by the diversity of native plants in my lawn. Early on I had noted *Pratia angulata*, *Centella uniflora* and *Viola cunninghamii* on the northern side of the property. *Hydrocotyle novae-zelandiae* and *Leptinella dispersa* plus *L. squalida* were abundant, especially in the shade. Later I noted *Helichrysum filicaule* on the eastern lawn but I was stunned when I discovered *Ophioglossum coriaceum* in the lawn in the back corner of the section.

I added these species to the list of plants and animals recorded on the property that I had started after Neill Simpson pointed out the *Gastrodia cunninghamii* by my front gate. Gradually the list built up as I noted new species. Then Colin Meurk sampled my lawn as part of a study he was doing on lawn species diversity and abundance. The list of vascular plant species recorded from my lawn in Otatara is given in Table 1.

I was quite proud of my lawn in Otatara because it had quite high native diversity and also included uncommon species like the *Ophioglossum*. I also was struck by how diverse lawns can be. Generally we tend to think of lawns as grass and daisies with the occasional undesirable thing in them that needs to be controlled: flatweeds like *Hypochoeris radicata* or mosses. When I moved back to Wellington I looked more closely at my lawn in Rongotai. There did not seem to be any native species in it but it looked relatively diverse. So, in October 2009, I decided to sample it to find out what was there.

METHODS

I made a 10 × 10 cm quadrat by cutting a square hole of that size in the lid of a takeaway container. Then, using this quadrat, I took 20 samples of my lawn vegetation at random. To get random samples, I simply threw the quadrat about all over the lawn and, where it landed, I sampled but I was careful not to sample in any overlapping places.

At each sample point I recorded the percentage cover for each species present in the 10 × 10 cm quadrat. If there were bare patches or mosses and liverworts present I recorded the percentage cover of those too. The

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Table 1. Vascular plant species recorded from the lawn at 67 Marama Ave North, Otatara (800 m^2) and 9 Mamari Street, Rongotai (30 m^2). Abundance is scored using the Braun-Blanquet scale from 1–5 for those species sampled using a 10 × 10 cm quadrat (Rongotai). Other species noted are recorded as +. Accession numbers for specimens identified by Landcare Research staff are listed. * indicates species not indigenous to New Zealand.

Species	Otatara	Rongotai	Common to both
**Achillea millefolium*	1	2	1
**Agrostis capillaris*	2	3	1
**Agrostis gigantea* CHR614071-2	-	+	-
**Ajuga reptans*	1	-	-
**Allium triquetrum*	-	+	-
**Anthoxanthum odoratum*	1	-	-
**Aphanes* sp. CHR614069	-	+	-
**Arctotheca calendula*	-	+	-
**Bellis perennis*	2	-	-
**Borago officinalis*	-	+	-
**Bromus willdenowii*	2	1	1
Centella uniflora	3	-	-
**Cerastium fontanum*	1	-	-
**Cerastium glomeratum*	-	1	-
**Cirsium vulgare*	1	-	-
**Conyza albida*	-	+	-
Coprosma repens	-	1	-
**Coronopus didymus*	-	+	-
**Crepis capillaris*	2	+	1
**Cyperus rotundus*	-	+	-
**Dactylis glomerata*	1	-	-
**Digitaria setigera/violascens*?	-	+	-
**Ehrharta erecta*	-	1	-
Epilobium brunnescens	1	-	-
Epilobium nummulariifolium	1	-	-
**Euphorbia peplus*	-	+	-
**Festuca rubra* CHR614070	1	+	1
**Geranium molle*	-	1	-
**Gnaphalium calviceps* CHR614068	-	+	-
**Hedera helix*	-	+	-
Helichrysum filicaule	2	-	-
**Holcus lanatus*	1	1	1
Hydrocotyle novae-zelandiae	3	-	-

Species	Otatara	Rongotai	Common to both
**Hypochoeris radicata*	3	2	1
Leptinella dispersa	2	-	-
Leptinella squalida	3	-	-
Leptospermum scoparium	1	-	-
**Lolium perenne*	1	+	1
**Lotus pedunculatus*	2	3	1
**Medicago arabica* CHR614067	-	+	-
**Myosotis sylvatica*	-	+	-
Ophioglossum coriaceum	1	-	-
Oxalis exilis	1	-	-
**Oxalis latifolia*	-	+	-
**Plantago coronopus*	-	+	-
**Plantago lanceolata*	1	+	1
Plantago triandra	1	-	-
Plantago uniflora	1	-	-
**Poa annua*	2	2	1
**Poa pratensis* CHR614073	-	1	-
**Polycarpon tetraphyllum*	-	1	-
Pratia angulata	1	-	-
**Prunella vulgaris*	2	-	-
Pseudognaphalium luteoalbum	1	-	-
**Ranunculus repens*	1	-	-
**Rumex acetosella*	1	-	-
**Sagina procumbens*	1	+	1
**Sonchus oleraceus*	-	+	-
**Stellaria media*	-	+	-
**Taraxacum officinale*	1	+	1
**Trifolium dubium*	2	-	-
**Trifolium repens*	2	4	1
**Verbascum blattaria* WELT SP089739	-	+	-
**Veronica persica*	-	1	-
Viola cunninghamii	2	-	-
Number of native species	15	1	
Number of exotic species	24	39	14
Total species	**39**	**40**	

total cover for each quadrat was 100%. In addition to the sampling with the quadrat, I walked back and forth across the lawn looking for species that had not been recorded in the quadrat sampling.

I calculated the average percentage cover for each species and those data were converted to Braun-Blanquet scores so they were compatible with the data collected by Colin Meurk for the Otatara lawn. A score of 5 is attributed to species with >75% cover; 4 for 50–75% cover, 3 for 25–50% cover, 2 for 5–25% cover and 1 for up to 5% cover. I used the + symbol for those species that I recorded outside of the quadrat sampling.

RESULTS

Rongotai lawn

A total of 40 species was recorded in my Rongotai lawn, one of which is native: *Coprosma repens*. The dominant species were *Trifolium repens*, *Agrostis capillaris* and *Lotus pedunculatus*, with Braun-Blanquet scores of 4, 3, and 3 respectively (Table 1). The number of species recorded per quadrat was 2–6 and in each quadrat there was at least 1% of bare ground.

The majority of species in the lawn were infrequent though. Thirty three species had a Braun-Blanquet score of 1, and in some cases just one individual was recorded; e.g., *Coprosma repens*, *Allium triquetrum*, *Hedera helix*, *Verbascum blattaria* (Fig. 1). The most widespread and abundant species in the lawn were *Trifolium repens* and *Agrostis capillaris* (white clover and browntop). These two species were found in the majority of the quadrats (Table 2). *Lotus pedunculatus* was quite abundant but as equally widespread as less abundant species, like *Poa annua* and *Veronica persica*.

Comparison of lawns

Almost the same number of species was recorded in each lawn: 39/40 species, Both lawns shared dominant species (*Agrostis capillaris*, *Hypochoeris radicata*, *Lotus pedunculatus* and *Trifolium repens*) and 14 species were common to both lawns. The proportion of native species in the Otatara lawn was almost 40% compared with about 3% in the Rongotai lawn. As indicated in the introduction, the Otatara lawn had a much greater diversity of native plant species and some of them were quite abundant (Table 1).

The Otatara lawn had 16 species that were common (Braun-Blanquet scores of 2 or 3) compared with the Rongotai lawn with just six species that were common (scores of 2–4). Thus, although the two lawns had a similar number of species recorded, the Otatara one was generally more diverse, having fewer infrequently recorded species (59% with a score of 1 in Otatara cf. 85% with a score of 1 or + in Rongotai).

Table 2. Number of quadrats that species were recorded in during sampling of the Rongotai lawn.

Species	No. of quadrats
Achillea millefolium	2
Agrostis capillaris	19
Bromus willdenowii	1
Cerastium glomeratum	6
Coprosma repens	1
Ehrharta erecta	6
Geranium molle	2
Holcus lanatus	2
Hypochoeris radicata	2
Lotus pedunculatus	7
Poa annua	7
Polycarpon tetraphyllum	1
Trifolium repens	16
Veronica persica	7

DISCUSSION

We tend to think of lawns as grass with daisies and perhaps a few flatweeds. They can look relatively homogeneous but often are quite diverse and they can turn up surprises. It was the surprise of having an uncommon and interesting fern, *Ophioglossum coriaceum*, in my Otatara lawn that first got me interested in lawn diversity. I didn't expect any surprises in my Rongotai lawn as it looked fairly uninteresting: certainly not full of natives like my lawn in Southland. But I was wrong...

Surprise number one was the number of species recorded in each lawn being virtually equal, though the Rongotai lawn is almost exclusively exotic species (as most lawns are). My Rongotai lawn was more diverse than I thought. The second surprise was that two species found in my lawn have been recorded as naturalised in the Wellington region only recently. In Flora volume IV, *Verbascum blattaria* is recorded as having a North Island distribution only, as far south as Wairarapa (Webb et al. 1988). The Virtual Herbarium, however, has a record from Wellington: Barry Sneddon collected *Verbascum blattaria* from Karori, 22 April 2009. *Agrostis gigantea* has been recorded as naturalised in the southern Waikato and Southland. This is the first naturalised record from Wellington (Edgar & Connor 2000) although the Virtual Herbarium has records from Wellington, dating from 1906 which may have been from sown pasture.

The third surprise was that by looking closely at my lawn I discovered plants that I really didn't want getting established. I dug out the one *Allium triquetrum* (onion weed)—it was a single bulb that had just begun to flower. I also pulled out a number of small *Aphanes* sp. plants, mistaking them for *Soliva* sp. (Onehunga weed). The one plant of *Verbascum blattaria* (white mullein) I dug out to make a herbarium specimen to add to the known distribution. It has a very attractive flower (see Fig. 1) and would be an ideal cottage garden plant. Quite likely that is how it ended up in my lawn, having escaped from my garden in earlier times or someone else's (my lawn is mown by a contractor who uses his own mower). Early weed control is possible if you scan your lawn.

I sampled the lawn in late spring when the growth was lush and many species had begun flowering. I waited for some of the unknown species to flower so I could identify them and, in the case of biennials like *Verbascum blattaria*, that took two summers. If I were to sample at a different time of year, I would get slightly different results: more bare ground and dead grass in a dry spell, for example. In some summers my lawn is very dry and brown. That is why it is dominated by hardy perennials but is infiltrated by a large number of other species.

What's in your lawn?

Figure 1. *Verbascum blattaria* in a Rongotai lawn, January 2011.

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