

## **Impacts of English ivy on Forest Ecology in Puahanui Bush, NZ**

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Presence of English ivy in forests affects regeneration processes in the northern hemisphere ( see Okerman, 2000 and Metcalfe 2005), but nothing had been done to establish this in New Zealand forests.

English ivy had established in over half of the 130 ha covenant of Puahanui Bush by 2001. In these areas there was an average ground cover of 66% of ivy.



In some places it was more like 100% cover. Intuitively one realizes that there has to be an impact in those areas

However, in other areas the ivy seemed to remain quite sparse and some species seemed to be doing quite well in spite of the presence of ivy. So we decided to do some monitoring to see what was really going on.



So we counted seedlings and saplings in 100 1metre square plots on randomly placed transects, stratified to where ivy was present or absent. From this we got a density estimate of mean seedlings per metre square for each species, and then we compared areas where ivy was present and absent, using two-tailed t-tests. The results are shown below.

Species	Seedlings m <sup>2</sup>					Saplings m <sup>2</sup>				
	Ivy present	SE	Ivy absent	SE	P*	Ivy present	SE	Ivy absent	SE	P*
Titoki ( <i>Alectryon excelsis</i> )	16.20	2.82	17.00	5.19	0.88	6.80	1.31	7.20	2.64	0.87
Mahoe ( <i>Meliccytus ramiflorus</i> )	1.20	0.66	3.20	1.58	0.26	2.00	0.80	2.20	0.52	0.88
Pigeonwood ( <i>Hedycarya arborea</i> )	1.20	0.72	3.40	1.89	0.38	1.00	0.69	0.40	0.36	0.21
<b>Shrubby mahoe</b> ( <i>Meliccytus micranthus</i> )	2.60	1.04	9.40	2.09	<b>0.03</b>	4.40	2.13	5.20	2.44	0.73
<b>Hangehange</b> ( <i>Geniostoma rupestre</i> )	0.00	0.00	0.40	0.36	0.37	0.00	0.00	0.00	0.00	1.00
<b>Round leaved coprosma</b> ( <i>Coprosma rotundifolia</i> )	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.40	0.22	0.18
Rohutu ( <i>Lophomyrtus obcordatum</i> )	0.60	0.36	4.60	3.67	0.40	0.40	0.22	2.60	1.91	0.38
Poataniwha ( <i>Melicope simplex</i> )	2.20	0.91	2.60	1.15	0.54	0.80	0.44	1.20	0.52	0.18
<b>Large leaved coprosma</b> ( <i>Coprosma grandifolia</i> )	0.00	0.00	0.40	0.36	0.37	0.00	0.00	0.20	0.18	0.37
Kawakawa ( <i>Macropiper excelsum</i> )	1.20	0.52	10.40	2.96	0.07	1.00	0.49	7.20	3.08	0.16
<b>Rangiora</b> ( <i>Brachyglottis repanda</i> )	0.00	0.00	0.20	0.18	0.37	0.00	0.00	0.00	0.00	1.00
<b>Red matipo</b> ( <i>Myrsine australis</i> )	0.20	0.18	1.20	0.33	<b>0.03</b>	0.80	0.72	1.20	0.52	0.76
<b>Putuputuweta</b> ( <i>Carpodetus serrata</i> )	0.00	0.00	0.20	0.18	0.37	0.00	0.00	0.00	0.00	1.00
Lacebark ( <i>Hoheria sextylosa</i> )	0.00	0.00	0.00	0.00	1.00	0.20	0.18	0.00	0.00	0.37
<b>Kohuhu</b> ( <i>Pittosporum tenuifolium</i> )	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.20	0.18	0.37
Rewarewa ( <i>Knightia excelsa</i> )	0.00	0.00	0.80	0.44	0.18	0.00	0.00	0.20	0.18	0.37
Unknown two leaved seedlings	16.80	6.70	40.00	12.65	0.24	0.00	0.00	0.00	0.00	1.00
<i>Coprosma rhamnoides</i>	0.00	0.00	0.40	0.22	0.18	0.20	0.18	0.80	0.52	0.43
<b>Lancewood</b> ( <i>Pseudopanax crassifolius</i> )	0.00	0.00	1.00	0.49	0.14	0.00	0.00	0.00	0.00	1.00
Broom ( <i>Carmichaelia</i> )	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.20	0.18	0.37
Matai ( <i>Prumnopitys taxifolia</i> )	0.00	0.00	0.00	0.00	1.00	0.20	0.18	0.40	0.36	0.70
<b>Fuchsia</b> ( <i>Fuchsia excorticata</i> )	0.00	0.00	0.20	0.18	0.37	0.00	0.00	0.00	0.00	1.00
<b>Total Mean Densities</b>	4.72	1.13	9.54	1.78	<b>0.05</b>	1.93	0.03	2.77	0.55	<b>0.05</b>

Table 1: Comparison of mean seedling and sapling densities where ivy is present and absent

Yes, overall there was a significant difference in seedling and sapling density between where ivy is present and absent. Of as much interest is that 38% of species were completely absent from plots that contained English ivy. These species are shown in bold in Table 1.

We also know that ivy affects standing trees. Ivy changes to an aborescent adult form when it climbs. Some of the native podocarps were completely covered in ivy. When the meristems are covered, as in the photo below, the growing cells are prevented from growing, thereby reducing host tree vigour and eventually causing death

The live wood of ivy is also very heavy and the added weight makes the big trees more susceptible to windthrow.



We measured canopy intactness using percentage canopy cover and point intercept methods, but this monitoring did not show any significant differences between where ivy was present or absent. However there are many other variables that contribute to canopy intactness, including past selective logging and age of forest. Seeing many large trees laying prone on the ground in the areas of most dense ivy is some evidence that there has been an impact at this level of the forest too.

#### References

**Okerman, A. 2000.** Combating the "Ivy Desert": The Invasion of *Hedera helix* (English Ivy) in the Pacific Northwest United States. Restoration and Reclamation Review. Vol 6, No. 4, Fall 2000. Department of Horticultural Science. University of Minnesota.

**Metcalf, DJ. 2005.** Biological Flora of the British Isles. No. 240. *Hedera helix* L. Journal of Ecology 2005, 93

[http://www.issg.org/database/species/management\\_info.asp?si=469&fr=1&sts=sss](http://www.issg.org/database/species/management_info.asp?si=469&fr=1&sts=sss)  
The Garry Oak Ecosystems Recovery Team (GOERT)., 2003. Field manual of *Hedera helix*  
<http://www.portlandonline.com/parks/index.cfm?c=47820>