

***MYOSOTIS LYTTTELTONENSIS* MONITORING UPDATE 2017 – PORT HILLS**

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Myosotis lytteltonensis is located at 14 sites in the Port Hills, Christchurch. These sites are made up of both potentially natural and planted populations that have been monitored since 2008. *Myosotis lytteltonensis* were planted along the Summit Road near Ahuriri and The Tors in 1990 by Richard Pender, a student gardener at the Botanic Gardens, with advice from Nick Head, Department of Conservation (Pender 1999).

Further plantings were made between 2006 and 2016 by Anita Spencer, Department of Conservation, and by Di Carter, Christchurch City Council Regional Parks, using *M. lytteltonensis* grown at the Department of Conservation's Motukarara nursery. The seed source for these grown plants was the Mt Evans population. Recent taxonomic work being undertaken by Heidi Meudt, Te Papa Wellington, will show any genetic variation between the planted and possible natural populations on the Port Hills.

Sites that are thought to be possible natural populations of *M. lytteltonensis* were found by Alice Shanks and Carol Jensen, who were employed by the Christchurch City Council Regional Parks team to survey rock outcrop vegetation between 2006 and 2009. The Tauhinu-Korokio *M. lytteltonensis* was found by Ian Hankin, Department of Conservation in 2014. A further site was found by Marcus Davis on DoC land in 2014 during an ecological survey of the bluffs above the Sumner Road as part of the road re-opening works. (Note: this site has not been monitored yet).

At the outset of monitoring in 2008/2009, it was intended individuals would be followed in an attempt to monitor recruitment and to understand the longevity of adults and seedlings. Monitoring ceased after the earthquakes in 2010, so it has not been possible to follow recruitment. With the growing number of sites, it is now more practicable to count total numbers.

From initial observations it seems some (possibly many) adults become inundated with grass and die out, but at this stage there seems to be sufficient recruitment from seedling establishment to allow for an increase in total numbers to sustain the population. Plants have generally seeded downwards from the parent plants, but in 2017 recruitment above or across from the parent plant was observed at some sites.

Total numbers of plants have increased from 80 planted *M. lytteltonensis* in 1990, to 1154 plants in 2017 (Table 1, p. 49; Fig. 1). The largest increases have been at Ahuriri (Fig. 2) and The Tors roadsides planted 27 years ago, and at two sites planted 11 years ago at Marleys Hill roadside and Sugarloaf.

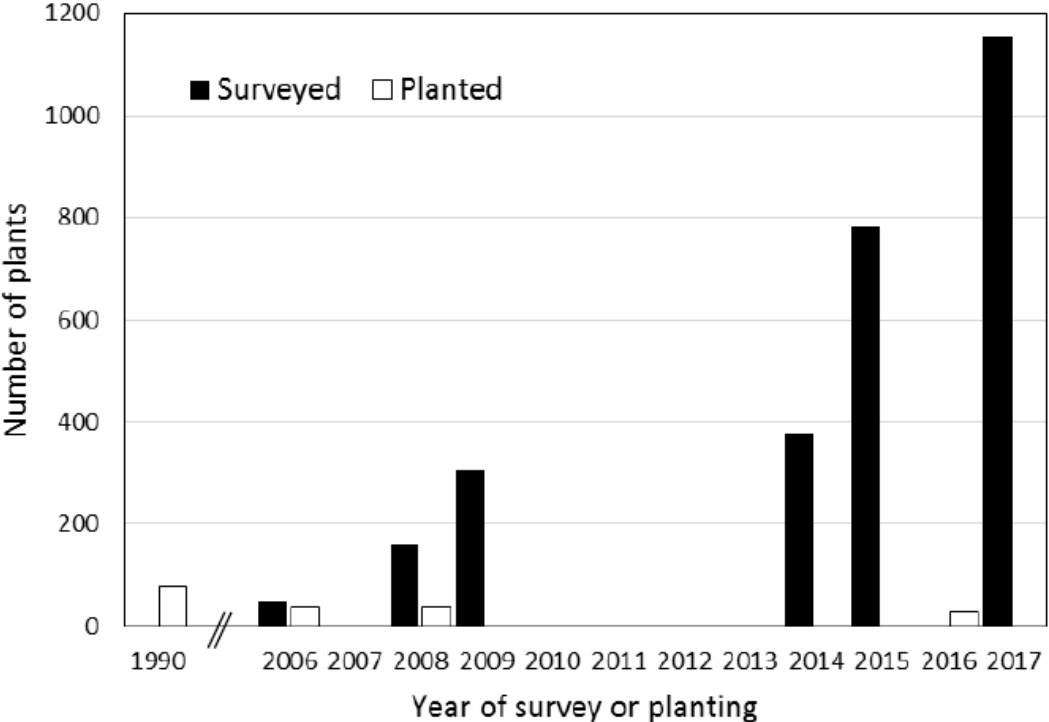


Figure 1 Total numbers of *M. lytteltonensis* plants counted in surveys (including naturally occurring plants) and planted between 1990 and 2017 in the Port Hills.



Figure 2 Ahuriri roadside *Myosotis lytteltonensis* monitoring site, November 2017.

Mt Cavendish and The Tors Crater Rim sites have made slower increases in 9 years, possibly due to the lack of suitable vertical rock structure with sufficient grass or soil ledges for seedlings to establish. The likely natural populations at Ohinetahi and Montgomery Reserves are less vigorous and are gradually being outcompeted by either grass or gorse. The Tauhinu-Korokio Reserve site, found 2 years ago, is showing promise of increasing numbers although plants are likely to remain less vigorous due to the thin soils in ledges at this site. The proportion of adult plants (i.e. plants in flower or capable of flowering) and seedlings varies each year. In 2017, of the 1154 plants, 524 were adult plants and 630 seedlings.

The roadside sites at Ahuriri, Marleys, and The Tors, make up just over 60% of the total population in 2017, with 716 plants (with a 50:50 ratio of adult and seedling plants). The plants at Ahuriri (Fig. 3) and Marleys (Fig. 4, p. 46), in the south western end of the Port Hills, had the largest and most abundant flowering plants in 2017 after a wet winter and a long wet spring. These sites are both east/south-east facing and in higher rainfall zones, with Ahuriri planted and regenerating for 27 years, and Marleys for 11 years.



Figure 3 Ahuriri roadside site, plots 58, 59 and 60, planted 27 years ago – large clusters of flowering plants, November 2017.



Figure 4 Marleys Hill roadside site, plot 57, planted 11 years ago – large clusters of flowering plants, November 2017.

In contrast, the Tors roadside site (Fig. 5), which has also been planted for 27 years, had high numbers of plants in 2017, but the plant size and abundance of flowers was less than at Ahuriri and Marleys. This is possibly due to the shorter rock bluff height with the main soil covered ledges for colonisation restricted to the base of the rock face.



Figure 5 The Tors roadside site, plot 54, planted 27 years ago – smaller clusters of flowering plants, November 2017.

Similarly, *M. lytteltonensis* populations at sites other than the roadside sites, also had smaller plants and less abundant flowering. The best of these sites are Sugarloaf, The Tors Crater Rim, Mt Cavendish and Tauhinu-Korokio, which have a combined current population of 366 plants (with 40:60 ratio of adults and seedlings).

There was concern expressed about the most robust planted populations being on roadsides, which are more vulnerable to fire and human disturbance. To ensure sufficient robust and stable populations are established, monitoring will continue annually at all sites for at least the next 3 – 5 years, as a joint project between CCC (Di Carter and Kristina Macdonald) and DoC (Tom Hitchon). The three roadside populations at Ahuriri, Marleys and The Tors seem to be at a healthy self-sustaining level, which we predict will continue to increase over this time.

The objective for the four main non-roadside populations, that are currently less robust, is to monitor these sites until they reach at least 500 – 700 plants with reasonably equal adult to seedling ratios. Some additional planting may be required to boost these sites. Having robust populations away from roadsides and human interference will ensure this species is at less risk in the long term.

If time and resources allow, we may plant a small number of new sites, ideally in the higher rainfall zone to the southwest of the Port Hills simulating Ahuriri and Marleys roadside sites.

Reference

Pender P 1999. *Urtica linearifolia* and *Myosotis australis* var. *lytteltonensis*: two threatened plants. Canterbury Botanical Society Journal 33, 38–45.

Table 1 Numbers of individual plants of *M. lytteltonensis* counted in field surveys conducted between 1990 and 2017 at 14 sites in the Port Hills (listed from west to east). Also shown are numbers of *M. lytteltonensis* plants planted at different sites (p), and numbers of naturally occurring plants (n?) where no known planting had previously been undertaken. Not all sites were counted each year.

	1990	2006	2008	2009	2014	2015	2016	2017
Ahuriri roadside	40 (p)	6 (p)		83	80	200		220
Coopers Knob		15 (p)	0	0	3			
Ohinetahi Reserve			# (n?)					5
Marleys roadside		8 (p)	30	8	22	149		158
Sugarloaf Reserve		11 (p)	26	22	39	86	8 (p)	155
Montgomery Spur			# (n?)	11		24		23
The Tors roadside	40 (p)	41	90	58	161	163		338
The Tors Crater Rim		5 (n?)	8 (p)	14	21	23	10 (p)	87
Castle Rock			5 (p)	1				
Whakaraupo		2 (n?)	4	0	0			
Mt Cavendish			4 (n), 22 (p)	106	53	130		56
Tauhinu-Korokio						8 (n?)		68
Mt Pleasant		1 (n?)					10 (p)	44
Livingston col			3 (p)	3	0			
Total planted (p)	80	40	38	0	0	0	28	0
Total counted in surveys		49	154	306	379	783		1154