

Online Resources_1

Table 1. Number of colonisations and extinctions per species and per management type between 2006 and 2015. The numbers represent the amount of sites where each species was gained (colonisation) or lost (extinction). The last column sums up the net effect of colonisation gains and extinction losses per species.

	Ruderal sites (n=7)			Semi-natural sites (n=7)			Traditional parks (n=5)			
Species	Colonizations	Extinctions	diff	Colonizations	Extinctions	diff	Colonizations	Extinctions	diff	Net effect
<i>Aphantopus hyperantus</i>	2	0	+2	2	0	+2	0	0		+4
<i>Aricia agestis</i>	3	1	+2	1	0	+1	0	0		+3
<i>Thymelicus lineola</i>	1	1		3	0	+3	0	0		+3
<i>Celastrina argiolus</i>	1	0	+1	0	0		1	0	+1	+2
<i>Cupido minimus</i>	2	0	+2	0	0		0	0		+2
<i>Satyrium w-album</i>	0	0		1	0	+1	0	0		+1
<i>Pieris brassicae</i>	1	0	+1	0	0		0	0		+1
<i>Pieris rapae</i>	1	0	+1	1	0	+1	0	2	-2	+0
<i>Gonepteryx rhamni</i>	0	0		0	0		0	2	-2	-2
<i>Maniola jurtina</i>	0	0		0	0		1	3	-2	-2
<i>Coenonympha pamphilus</i>	0	0		0	2	-2	0	1	-1	-3
<i>Pieris napi</i>	1	3	-2	1	1		0	1	-1	-3
<i>Zygaena filipendulae</i>	0	1	-1	0	1	-1	0	1	-1	-3
<i>Lycaena phlaeas</i>	0	3	-3	1	3	-2	0	0		-5
<i>Polyommatus icarus</i>	0	0		0	3	-3	0	3	-3	-6
<i>Aglais urticae</i>	0	3	-3	0	3	-3	0	3	-3	-9
<i>Inachis io</i>	0	5	-5	0	3	-3	0	1	-1	-9
Total	12	17		10	16		2	17		

Table 2. Butterfly and burnet moth presence and abundance shown as 1) number of sites where each species was observed, 2) number of individuals of each species observed and 3) proportion of the total number of individuals surveyed per year.

Species		Sites 2006	Sites 2015	Individuals 2006	Individuals 2015	Proportion (%) 2006	Proportion (%) 2015
<i>Maniola jurtina</i>		<u>18</u>	<u>17</u>	<u>1123</u>	<u>1403</u>	<u>28.6</u>	<u>56.8</u>
<i>Zygaena filipendulae</i>		<u>13</u>	<u>10</u>	<u>957</u>	<u>332</u>	<u>24.4</u>	<u>13.4</u>
<i>Aphantopus hyperantus</i>		<u>7</u>	<u>14</u>	<u>96</u>	<u>285</u>	<u>2.4</u>	<u>11.5</u>
<i>Pieris rapae</i>		<u>19</u>	<u>18</u>	<u>574</u>	<u>122</u>	<u>14.6</u>	<u>4.9</u>
<i>Polyommatus icarus</i>		<u>16</u>	<u>11</u>	<u>733</u>	<u>114</u>	<u>18.7</u>	<u>4.6</u>
<i>Coenonympha pamphilus</i>		<u>13</u>	<u>11</u>	<u>226</u>	<u>71</u>	<u>5.8</u>	<u>2.9</u>
<i>Cupido minimus</i>		<u>0</u>	<u>3</u>	<u>0</u>	<u>55</u>	<u>0.0</u>	<u>2.2</u>
<i>Thymelicus lineola</i>		<u>2</u>	<u>5</u>	<u>3</u>	<u>21</u>	<u>0.1</u>	<u>0.9</u>
<i>Aglais urticae</i>		<u>14</u>	<u>7</u>	<u>67</u>	<u>18</u>	<u>1.7</u>	<u>0.7</u>
<i>Aricia agestis</i>		<u>1</u>	<u>5</u>	<u>1</u>	<u>15</u>	<u>0.0</u>	<u>0.6</u>
<i>Pieris napi</i>		<u>9</u>	<u>6</u>	<u>29</u>	<u>11</u>	<u>0.7</u>	<u>0.4</u>
<i>Inachis io</i>		<u>11</u>	<u>2</u>	<u>83</u>	<u>8</u>	<u>2.1</u>	<u>0.3</u>
<i>Lycaena phlaeas</i>		<u>10</u>	<u>5</u>	<u>20</u>	<u>6</u>	<u>0.5</u>	<u>0.2</u>
<i>Ochlodes sylvanus</i>		<u>1</u>	<u>1</u>	<u>4</u>	<u>3</u>	<u>0.1</u>	<u>0.1</u>
<i>Pieris brassicae</i>		<u>1</u>	<u>2</u>	<u>1</u>	<u>2</u>	<u>0.0</u>	<u>0.1</u>
<i>Celastrina argiolus</i>		<u>0</u>	<u>2</u>	<u>0</u>	<u>2</u>	<u>0.0</u>	<u>0.1</u>
<i>Satyrrium w-album</i>		<u>0</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>0.0</u>	<u>0.0</u>
<i>Gonepteryx rhamni</i>		<u>1</u>	<u>0</u>	<u>5</u>	<u>0</u>	<u>0.1</u>	<u>0.0</u>
Total		<u>136</u>	<u>120</u>	<u>3922</u>	<u>2469</u>		

Figure 5. Proportional loss of species in sites classified as close or far from the edge city based on the median distance of the whole sampling size. No significant differences were found.

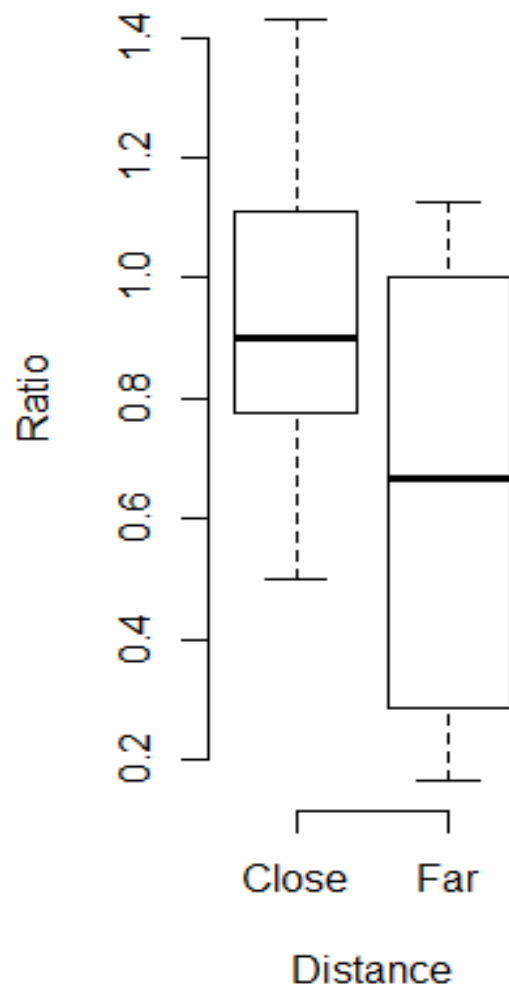


Figure 6. Change in the number of butterfly species in relation to the average vegetation height per site. Only ruderal and semi-natural sites were tested here, because traditional parks all had short cut grass during both years. A change value of 0 indicates that the site had the same number of species before (in 2006) and during our study (2015). If change is negative it means gain of species, and if it is positive it means loss. The relationship between vegetation height and change in butterfly species was not significant ($P = 0.1664$).

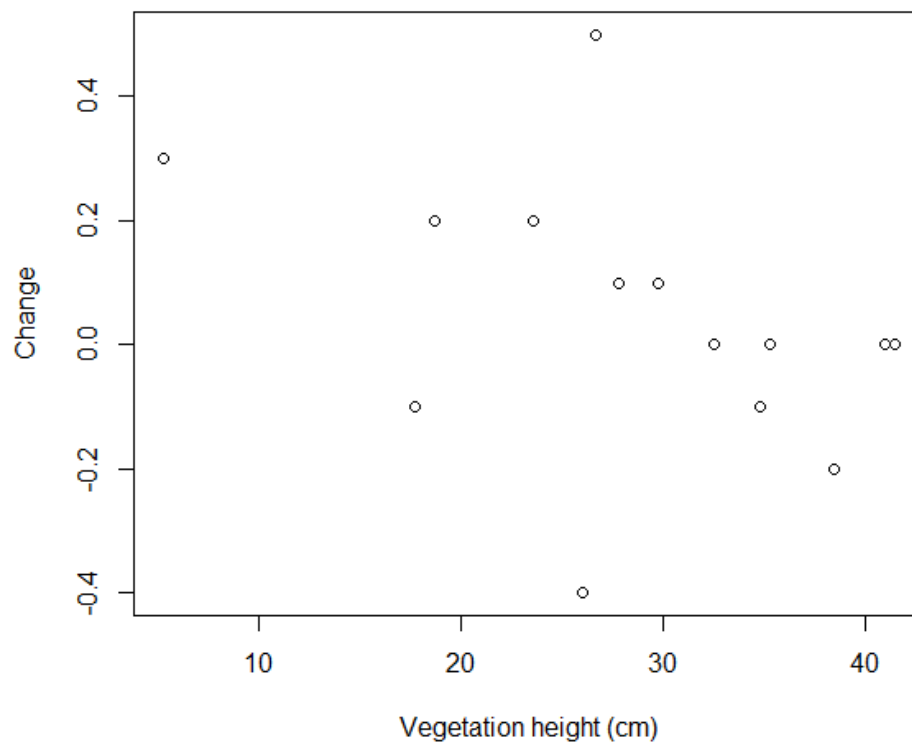


Figure 7. Change in the number of species per site in relation to distance of the site to the edge of the city. Only ruderal and semi-natural sites were tested here since traditional parks were much further away from the city edge. If change = 0, it means that the site had the same number of species before (2006) and during our study (2015). If change is negative it means gain of species, and if it is positive it means loss. The relationship between distance to city edge and change in butterfly species was not significant ($P = 0.2998$).

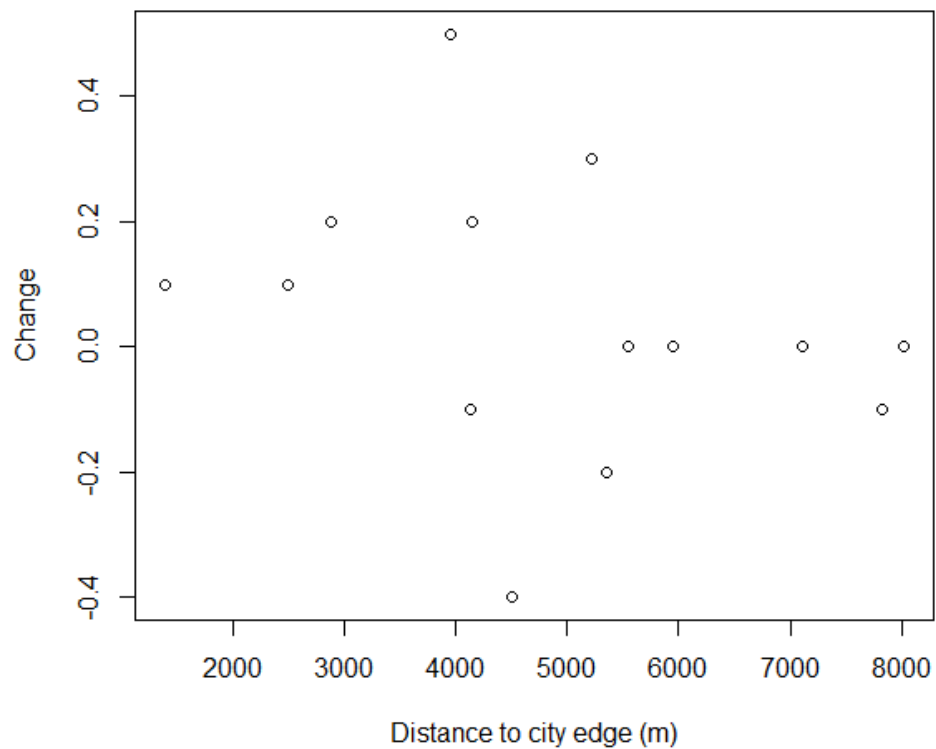


Figure 8. Change in the number of butterfly species in relation with the proportion of green spaces in a 2 km radius per site. Only ruderal and traditional sites were tested here since semi natural sites differed a lot in proportion of green spaces from the other two categories. If change = 0, it means that the site had the same number of species before (2006) and during our study (2015). If change is negative it means gain of species and if it is positive it means loss. The relationship between proportion of green spaces and change in butterfly species richness was not significant ($P = 0.2998$).

