

Hammock, B. G. and Wetzel, W. 2013. The relative importance of drift causes for stream insect herbivores across a canopy gradient. – Oikos 000: 000–000.

## Appendix 1

### Herbivore dry mass and additional methods

We measured herbivore dry mass in Convict Creek to determine whether the herbivore taxa used in our experiments (*Baetis tricaudatus* and *Epeorus*) comprised most of the biomass of the herbivore guild of the stream. At five randomly selected sites along Convict Creek, aquatic macroinvertebrates were quantitatively collected from one 400 cm<sup>2</sup> patch of substrate using a Surber Sampler. Invertebrates were sorted by functional feeding group according to the categorizations in Merritt et al. (2008). Animals with trophic relationships that included scraper or facultative scraper, or animals for which diatoms were listed under diet, were sorted by taxa. To be conservative, we also included Chironomidae as a herbivorous taxon, though we excluded Tanypodinae because the sub-family is predacious. Following sorting, animals were dried for 48 h at 50°C and then weighed. Herbivore taxa for which we obtained a measurable dry weight were Heptageniidae, *Baetis tricaudatus*, *Optioservus*, Chironomidae, and *Paraleptophlebia*. Dry weights of these taxa were 0.16 g m<sup>-2</sup> Heptageniidae (95% CI: ±0.09), 0.12 g m<sup>-2</sup> *B. tricaudatus* (95% CI: ±0.06), 0.03 g m<sup>-2</sup> *Optioservus* (95% CI: ±0.02), 0.003 g m<sup>-2</sup> Chironomidae (95% CI: ±0.006), and 0.002 g m<sup>-2</sup> *Paraleptophlebia* (95% CI: ±0.003). Together, *B. tricaudatus* and

Heptageniids totaled  $0.276 \text{ g m}^{-2}$  (95% CI:  $\pm 0.12$ ), or 88.7% of the total dry mass. Combined, the other taxa totaled  $0.035 \text{ g m}^{-2}$  (95% CI:  $\pm 0.03$ ), or 11.3% of the total dry mass.

We counted drift from our experimental channels at 20:00, 00:30, 05:30 and 10:00 for the density experiment and, due to seasonal changes in sunrise and sunset times, 19:30, 00:30, 07:00 and 10:00 in the canopy experiment and the excess food experiment. Water velocity ranged from  $0.53$  to  $0.99 \text{ m s}^{-1}$  (mean =  $0.70 \text{ m s}^{-1}$ ;  $n = 28$ ) in the density experiment, from  $0.14$  to  $0.29 \text{ m/s}$  (mean =  $0.23 \text{ m s}^{-1}$ ;  $n = 40$ ) in the canopy experiment, and from  $0.16$  to  $0.30 \text{ m s}^{-1}$  (mean =  $0.23 \text{ m s}^{-1}$ ;  $n = 30$ ) in the excess food experiment. Though we found them in Convict Creek, we did not use Corydalidae (Megaloptera) in the canopy experiment because its density was  $<0.5$  individuals/channel, nor did we include Acari and Tanypodinae because we considered them too small to influence mayfly drift.



Figure A1. The experimental channels used in the density, excess food, and canopy experiments. The photograph is of day 6, block 1 of the excess food experiment. The PVC pipes at the front of each channel contain the upstream driftnets.

## Appendix 2

### Analyses separated by taxa

Table 1. Density experiment models ordered by AICc, both combined and separated by taxa. D refers to initial density, and t to time.

Model fixed effects	AICc		AICc		AICc	
	$\Delta$ AICc	wt	$\Delta$ AICc	wt	$\Delta$ AICc	wt
	Combined		<i>Epeorus</i>		<i>B. tricaudatus</i>	
Pr(drift) $\sim$ t+t <sup>2</sup> +D	0	1	0	1	0	1
Pr(drift) $\sim$ t+t <sup>2</sup>	35.1	<0.001	11.6	<0.001	48.7	<0.001

Table 2. Canopy experiment models ordered by AICc, both combined and separated by taxa. P refers to predation, C to canopy, t to time, and N<sub>t</sub> is population size at time t.

Model fixed effects	AICc		AICc		AICc	
	$\Delta$ AICc	wt	$\Delta$ AICc	wt	$\Delta$ AICc	wt
	Combined		<i>Epeorus</i>		<i>B. tricaudatus</i>	
Pr(drift) $\sim$ t+t <sup>2</sup> +N <sub>t</sub> +P	0	0.65	0	0.77	0	0.46
Pr(drift) $\sim$ t+t <sup>2</sup> +N <sub>t</sub> +P+C	1.6	0.29	2.8	0.19	0	0.45
Pr(drift) $\sim$ t+t <sup>2</sup> +N <sub>t</sub> +P+C+P×C	4.7	0.06	5.8	0.04	3.1	0.1
Pr(drift) $\sim$ t+t <sup>2</sup> +N <sub>t</sub>	28	0	13.8	0	23.9	0
Pr(drift) $\sim$ t+t <sup>2</sup> +N <sub>t</sub> +C	30.2	0	16.4	0	25.2	0

Table 3. Excess food experiment models ordered by AICc, both combined and separated by taxa. F refers to isolation time, t to time, and N<sub>t</sub> to population size at time t.

Model fixed effects	AICc		AICc		AICc	
	$\Delta$ AICc	wt	$\Delta$ AICc	wt	$\Delta$ AICc	wt
	Combined		<i>Epeorus</i>		<i>B. tricaudatus</i>	
Pr(drift) $\sim$ t+t <sup>2</sup> +N <sub>t</sub> +F+F <sup>2</sup>	0	0.97	0	0.89	0.59	0.59
Pr(drift) $\sim$ t+t <sup>2</sup> +N <sub>t</sub> +F	6.8	0.03	4.1	0.11	0.41	0.41
Pr(drift) $\sim$ t+t <sup>2</sup> +N <sub>t</sub>	32.1	0	15.9	0	0	0