

Eveleens, R. A., McIntosh, A. R. and Warburton, H. J. 2019. Interactive community responses to disturbance in streams: disturbance history moderates the influence of disturbance types. – Oikos doi: 10.1111/oik.05868

## Appendix 1

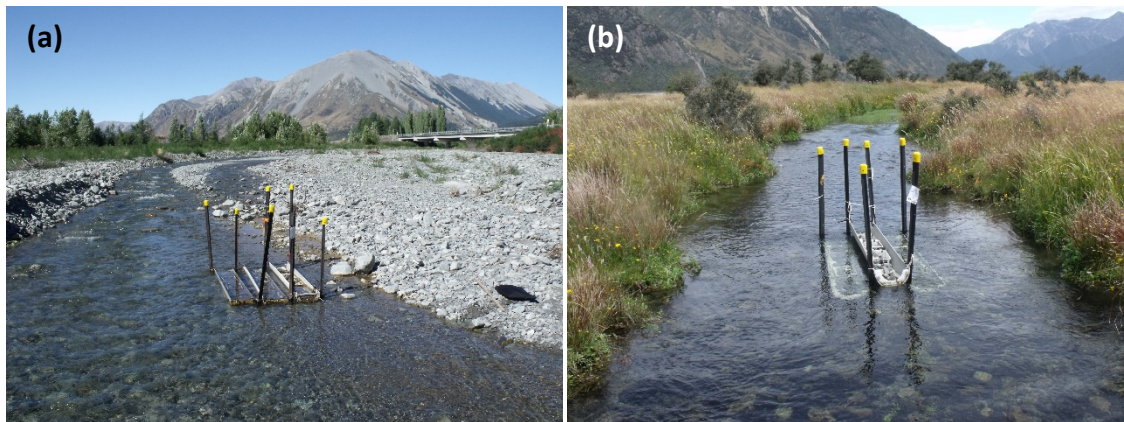


Figure A1. Experimental channel set-up in a frequently disturbed (a), and a stable stream (b). In each stream, groups of three channels made from pipe cut longitudinally were randomly assigned one of three treatments; control, rock-rolling or low-flow (raised middle channel in b).

Table A1. Location (latitude and longitude, NZ Transverse Mercator), disturbance history classification and associated Pfanckuch River disturbance index (RDI) score (low scores, less disturbed; high scores, more disturbed) and water chemistry for each stream used in this study. Water chemistry data presented includes the variability of water temperature as the coefficient of variation (CV) for continuously logged temperature data and as well the concentration of dissolved oxygen (DO) for each stream. Values given for environmental conditions are mean values from four measurements, taken when disturbance treatments were commenced, as well as 8, 16 and 35 days

Site	Disturbance history		Total Pfrankuch Score	Mean stream temp (°C)	CV stream temp	Mean low-flow temp (°C)	CV low-flow temp	Stream DO mg l <sup>-1</sup>	pH	Specific conductivity (µS <sub>25</sub> cm <sup>-1</sup> )	
	category	Lat.	Long.								
Cass Spring	stable	43.02576° S	171.75036° E	45	9.9	7.1	10.0	5.8	9.8	7.1	54.9
Grasmere	stable	43.03410° S	171.75815° E	52	14.0	6.6	14.3	19.4	6.9	7.0	74.7
One Tree	stable	42.99917° S	171.73119° E	42	8.6	3.9	10.7	30.7	10.6	7.0	57.1
Slip	stable	43.25569° S	171.70852° E	46	9.4	12.7	9.8	16.6	10.9	7.6	60
Waimakariri Spring	stable	43.01612° S	171.81176° E	41	10.2	12.4	10.7	15.7	10.1	7.0	63.4
	frequently										
Andrews	disturbed	42.99817° S	171.78964° E	119	11.7	16.6	11.7	16.8	10.4	7.9	86.0
	frequently										
Broken	disturbed	43.19394° S	171.72856° E	100	11.5	21.9	11.0	24.1	10.2	7.8	65.8
	frequently										
Cass	disturbed	43.02638° S	171.74816° E	101	11.3	28.3	11.3	29.5	9.9	7.8	58.0
	frequently										
Kowai	disturbed	43.30927° S	171.77227° E	102	12.2	20.1	12.2	19.8	10.3	6.9	63.8
Waimakariri	frequently										
Side Braid	disturbed	43.30927° S	171.77227° E	107	11.2	9.9	11.6	16.2	10.3	7.2	60.5

Table A2. Physical conditions measured in within or beside (stream temperature) groups of in-stream channels of three different treatments (control, rock-rolling or low-flow) located streams of different disturbance histories (n = 5 for each disturbance history). All values are means ( $\pm$  SEM) for all streams and sampling dates with each category. Depths and flow velocities were measured when disturbance treatments were commenced, as well as 8, 16 and 35 days later to span the period disturbances were applied for. Water temperatures were measured hourly for the five period of the experiment using HOBO pendant temperature loggers.

Disturbance history category	Channel depth (cm)			Channel flow velocity ( $\text{ms}^{-1}$ )			Temperature ( $^{\circ}\text{C}$ )	
	Control	Rock-rolling	Low-flow	Control	Rock-rolling	Low-flow	Stream temp ( $^{\circ}\text{C}$ )	Low-flow temp ( $^{\circ}\text{C}$ )
stable	26.2	26.3	4.5	0.3	0.3	0.0	10.4	11.1
	$\pm 3.7$	$\pm 4.4$	$\pm 0.2$	$\pm 0.1$	$\pm 0.1$	$\pm 0.0$	$\pm 1.2$	$\pm 1.1$
frequently disturbed	20.0	20.0	5.0	0.3	0.3	0.1	11.6	11.6
	$\pm 4.0$	$\pm 4.3$	$\pm 0.9$	$\pm 0.1$	$\pm 0.1$	$\pm 0.0$	$\pm 0.2$	$\pm 0.2$