Supporting Information for: Non-random dispersal in sympatric stream fishes: influences of natural disturbance and body size

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Contents

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Descriptive statistics for the mark-recapture data

Table S1 Descriptive statistics for the mark-recapture data of bluehead chub (BHC), creek chub (CRC), and striped jumprock (STJ). *Unique* individuals captured or recaptured are the number of individuals excluding repeated counts of the same individuals. *Total replicate* is the total number of individuals captured or recaptured, including repeated counts of the same individuals.

Stream	Species	Capture (unique)	Recapture (unique)	Capture (total replicate)	Recapture (total replicate)
Indian	BHC	470	171	968	284
	CRC	723	261	1454	431
	STJ	265	89	472	138
Todd	BHC	3362	834	5103	1102
	CRC	170	47	266	61
	STJ	614	254	1334	401

Model comparison using Widely Applicable Information Criterion

Table S2 Comparison of Widely Applicable Information Criterion (WAIC) between models that use the high flow (the occurrence of flow events exceeding the 99th percentile of daily water levels) and the median water level as a metric of streamflow conditions. Species name abbreviations are as follows: BHC, bluehead chub; CRC, creek chub; STJ, striped jumprock

	WAIC	
Species	Median flow model	High flow model
BHC	13967.1	13963.5
CRC	5148.2	5111.8
STJ	5524.1	5525.7

Parameter estimates of the Bayesian dispersal model with the 99th water level

Table S3 Parameter estimates of the Bayesian dispersal model that uses the occurrence of flow events exceeding the 99th percentile of daily water levels during the whole study period. Median estimates and the associated 95% credible intervals (95% CI) were reported. Species name abbreviations are as follows: BHC, bluehead chub; CRC, creek chub; STJ, striped jumprock

Species	Effect	Estimate	Lower 95% CI	Upper 95% CI
BHC	Intercept	3.29	3.15	3.42
	High flow	-0.08	-0.19	0.03
	Body size	0.01	-0.06	0.09
	High flow x body size	0.26	0.14	0.36
	Temperature	0.05	-0.01	0.11
	Stream (vs. Indian)	0.13	0.00	0.29
	Mean recapture prob. (μ_ϕ)	0.22	0.16	0.28
	SD of recapture prob. (σ_ϕ)	0.59	0.37	0.91
CRC	Intercept	3.35	3.24	3.49
	High flow	0.60	0.42	0.82
	Body size	-0.01	-0.15	0.10
	High flow x body size	-0.15	-0.36	0.09
	Temperature	-0.07	-0.17	0.02
	Stream (vs. Indian)	-0.47	-0.74	-0.10
	Mean recapture prob. (μ_ϕ)	0.28	0.23	0.33
	SD of recapture prob. (σ_ϕ)	0.36	0.18	0.60
STJ	Intercept	3.88	3.64	4.07
	High flow	0.25	0.05	0.43
	Body size	0.30	0.17	0.43
	High flow x body size	-0.11	-0.30	0.10
	Temperature	0.33	0.23	0.43
	Stream (vs. Indian)	-0.74	-0.97	-0.54
	Mean recapture prob. (μ_ϕ)	0.31	0.25	0.36
	SD of recapture prob. (σ_ϕ)	0.35	0.17	0.57

Parameter estimates of the Bayesian dispersal model with the median water level

Table S4 Parameter estimates of the Bayesian dispersal model that uses the median water level as a measure of stream flows (instead of the occurrence of flow events that exceeded the 99th percentile of daily water levels during the whole study period). Median estimates and the associated 95% credible intervals (95% CI) were reported. Species name abbreviations are as follows: BHC, bluehead chub; CRC, creek chub; STJ, striped jumprock

Species	Effect	Estimate	Lower 95% CI	Upper 95% CI
BHC	Intercept	3.17	3.00	3.30
	Median flow	-0.16	-0.21	-0.09
	Body size	0.15	0.09	0.22
	Median flow x body size	0.04	-0.03	0.10
	Temperature	0.00	-0.06	0.06
	Stream (vs. Indian)	0.23	0.07	0.41
	Mean recapture prob. (μ_ϕ)	0.22	0.17	0.28
	SD of recapture prob. (σ_ϕ)	0.60	0.40	0.95
CRC	Intercept	3.60	3.50	3.71
	Median flow	-0.03	-0.17	0.10
	Body size	-0.09	-0.21	0.00
	Median flow x body size	-0.05	-0.17	0.06
	Temperature	-0.10	-0.20	0.02
	Stream (vs. Indian)	-0.39	-0.80	-0.05
	Mean recapture prob. (μ_ϕ)	0.28	0.24	0.33
	SD of recapture prob. (σ_ϕ)	0.35	0.17	0.59
STJ	Intercept	4.11	3.89	4.33
	Median flow	0.16	0.04	0.28
	Body size	0.21	0.10	0.32
	Median flow x body size	0.04	-0.06	0.15
	Temperature	0.41	0.31	0.51
	Stream (vs. Indian)	-0.95	-1.20	-0.68
	Mean recapture prob. (μ_ϕ)	0.31	0.26	0.35
	SD of recapture prob. (σ_ϕ)	0.35	0.16	0.59

Frequency distributions for dispersal distance of bluehead chub

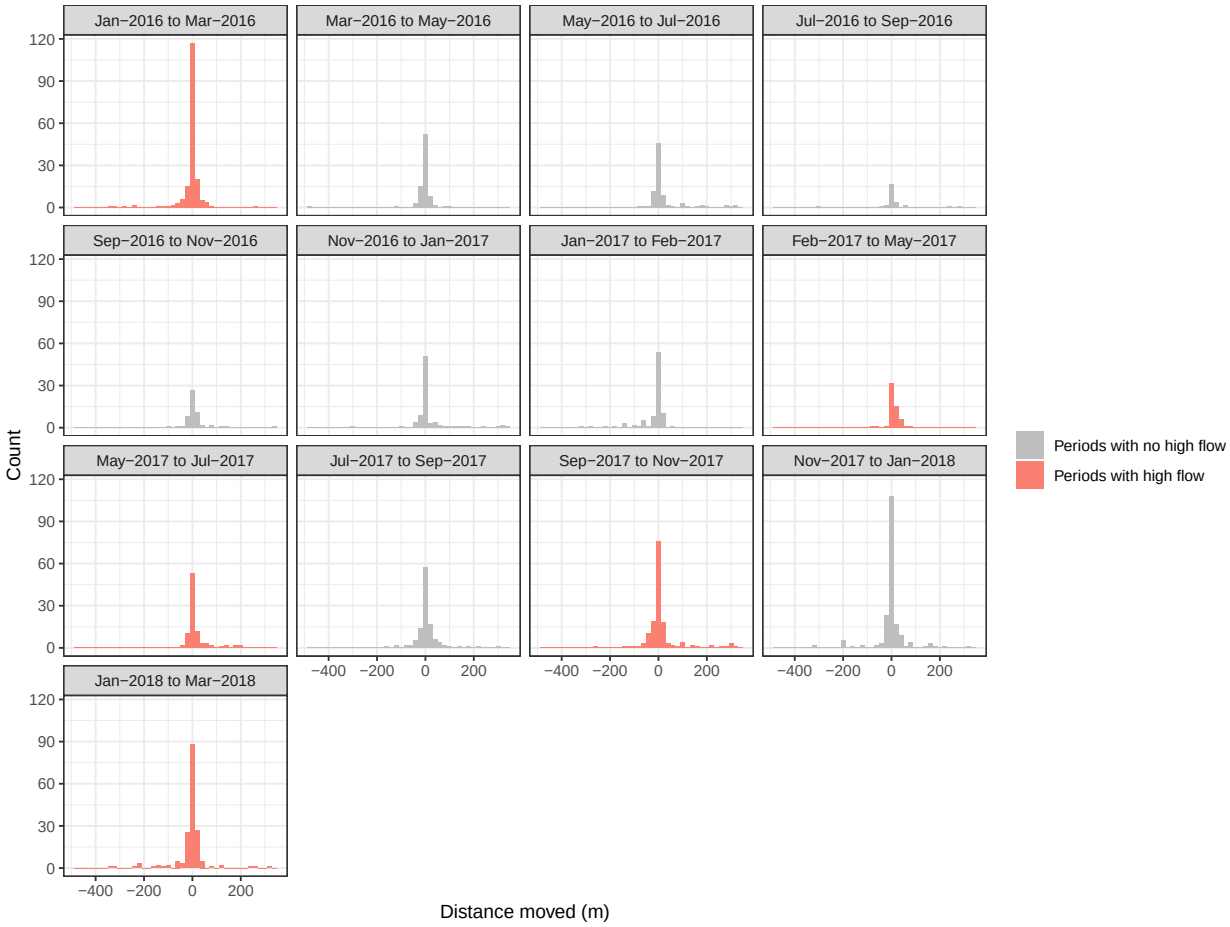

Figure S1 Frequency distributions for dispersal distance of bluehead chub (*Nocomis leptocephalus*). Data from two streams (Indian and Todd Creeks) were combined. Each panel corresponds to a 2-month sampling interval. Red-colored panels are the sampling intervals with extreme flows exceeding the 99th percentile of daily water levels.

Frequency distributions for dispersal distance of creek chub

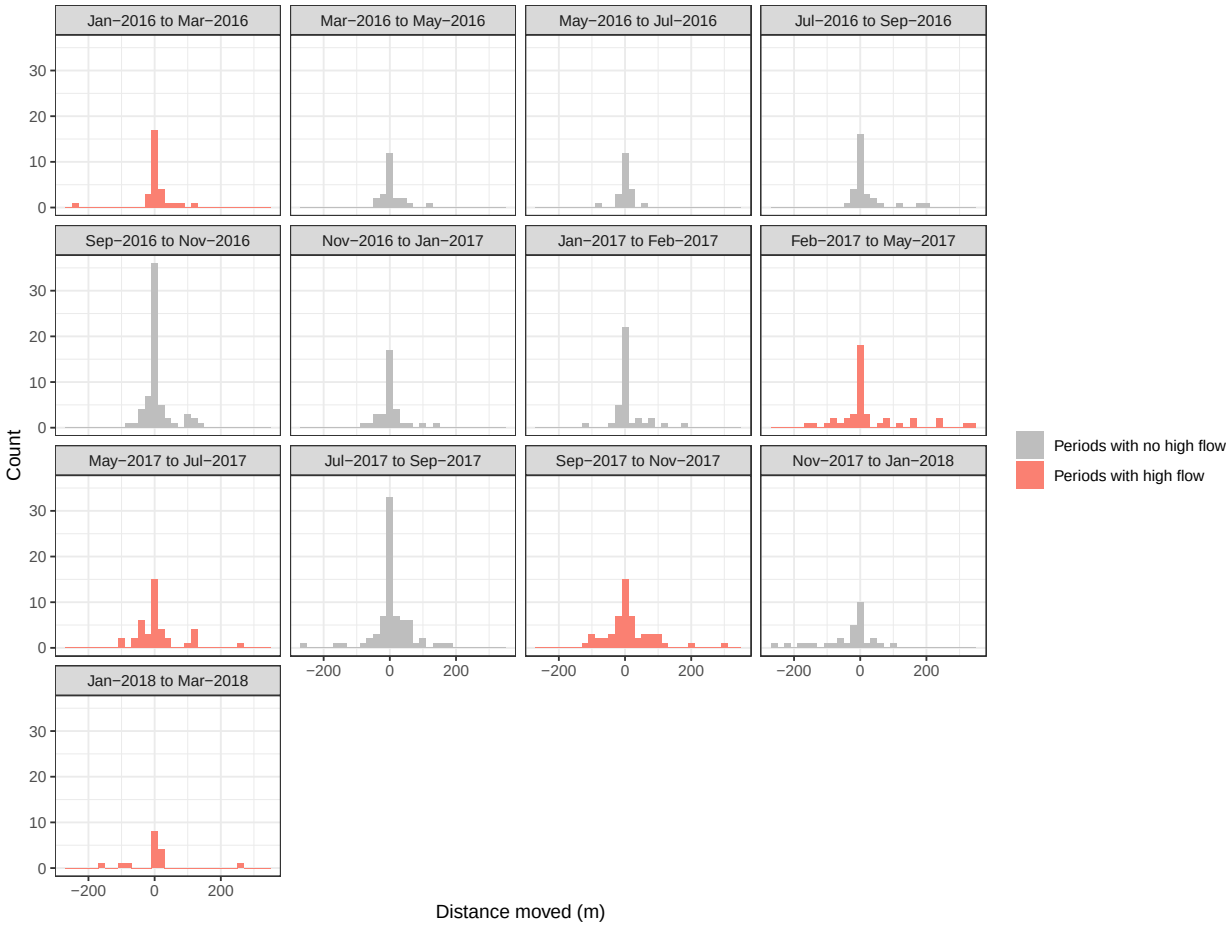

Figure S2 Frequency distributions for dispersal distance of creek chub (*Semotilus atromaculatus*). Data from two streams (Indian and Todd Creeks) were combined. See Figure S1 for details.

Frequency distributions for dispersal distance of striped jumprock

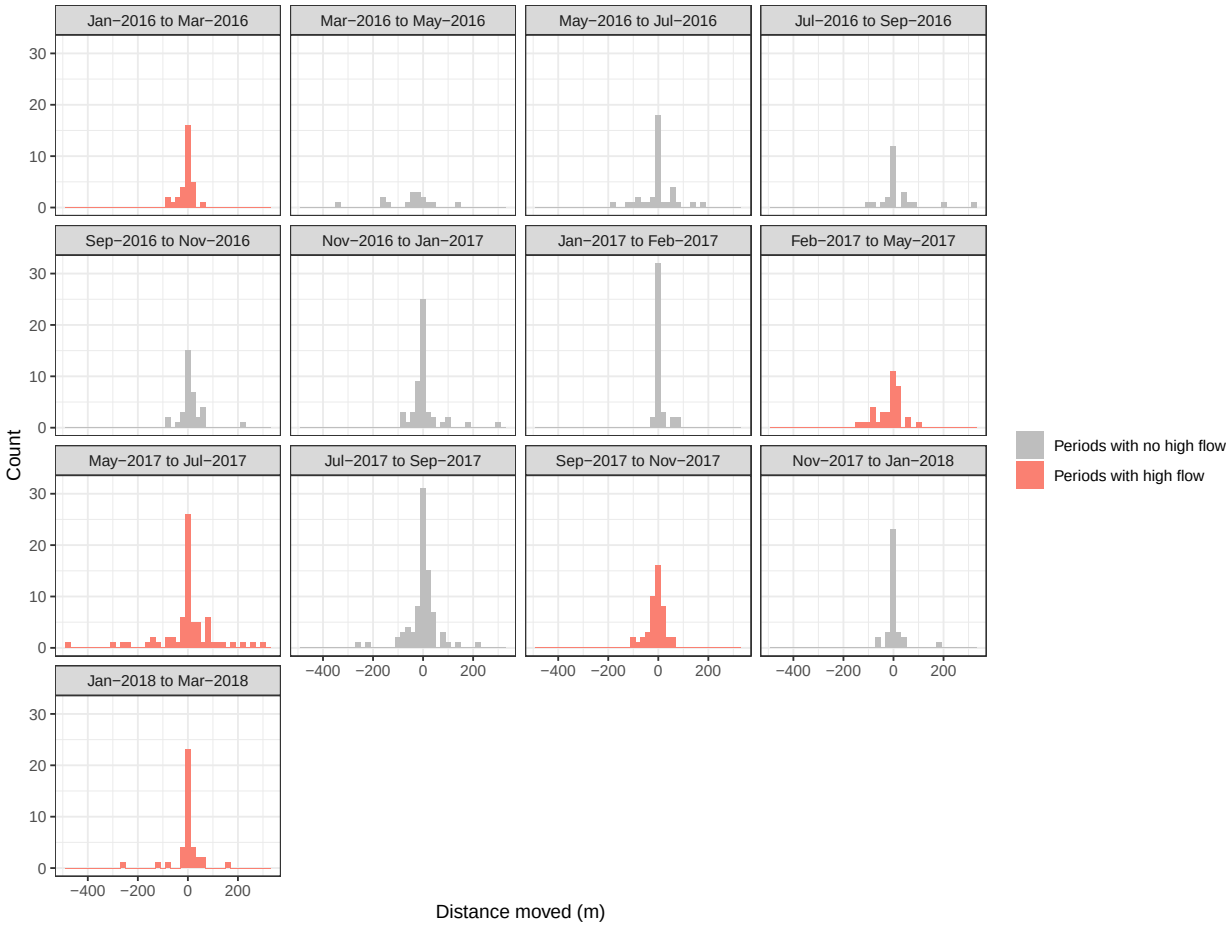

Figure S3 Frequency distributions for dispersal distance of striped jumprock (*Moxostoma rupicartes*). Data from two streams (Indian and Todd Creeks) were combined. See Figure S1 for details.