Online Supplementary Tables and Figures

Table S1: Abiotic characteristics of the experimental channels measured at three dates. Note that alevin salmon in this river system are typically found in these water flow velocities. The reported values are the means of the abiotic conditions across the 72 channels, with standard deviations in the parentheses. Water velocity was measured using a Doppler Ultrasonic flow meter and temperature was measured with a thermometer.

	Date measured		
	Jul-2-2007	Jul-5-2007	Jul-8-2007
Temperature °C	13.5	12.7	14.3
Rapid water depth (cm)	22.7 (7.8)	24.8 (8.6)	34.2 (9.0)
Slow water depth (cm)	18.8 (3.5)	22.3 (3.6)	30.5 (2.2)
Rapid water flow speed (cm/s)	48.0 (9.9)	54.2 (10.3)	59.0 (10.4)
Slow water flow speed (cm/s)	10.7 (5.9)	14.4 (5.8)	22.5 (5.6)

Table S2: Estimated variance components for the different traits without performing size correction

A Rapid				
		Trait		
	BD*	HD*	CP*	CAUD*
Mean	4.58	4.83	2.44	7.73
V_A	$0.1_{(0,17.7)}$	$48.2_{(20.1,66.8)}$	$4.6_{(2.1,8.7)}$	$23.6_{(7.7,39.7)}$
V_M	$0.7_{(0,38.7)}$	$0.90_{(0,110.2)}$	$0.1_{(0,20.8)}$	$0.5_{(0,42.2)}$
V_R	$6.5_{(1.8,11.5)}$	$18.8_{(10.4,35.6)}$	$1.2_{(0.4,3.4)}$	$10.8_{(4.4,20.7)}$
V_P	$22.26_{(14.84,57.05)}$	$78.08_{(53.71,177.41)}$	$8.48_{(5.96,27.96)}$	$44.73_{(29.86,84.87)}$
m^2	$0.005_{(0,0.68)}$	$0.004_{(0,0.62)}$	$0.005_{(0,0.75)}$	$0.003_{(0,0.51)}$
h^2	$0.004_{(0,0.70)}$	$0.53_{(0.18,0.81)}$	$0.39_{(0.09,0.86)}$	$0.49_{(0.18,0.8)}$
B Slow				
Mean	3.85	4.14	2.27	7.15
V_A	$0.2_{(0,30.4)}$	$0_{(0,5.1)}$	$2.1_{(0.8,6.6)}$	$0.1_{(0,10.8)}$
V_M	$10.2_{(0,118.0)}$	$2.7_{(0,27.2)}$	$0.2_{(0,12.1)}$	$0.4_{(0,25.8)}$
V_R	$28.6_{(16.8,36.3)}$	$9.6_{(7.2,11.2)}$	$2.5_{(0.7,3.6)}$	$16.9_{(11.5,19.6)}$
V_P	$51.74_{(39.79,158.64)}$	$16.8_{(12.5,40.6)}$	$7_{(5,18.1)}$	$26.32_{(19.89,49.53)}$
m^2	$0.33_{(0,0.74)}$	$0.21_{(0,0.69)}$	$0.004_{(0,0.69)}$	$0.004_{(0,0.54)}$
h^2	$0.003_{(0,0.46)}$	$0.001_{(0,0.27)}$	$0.28_{(0.06,0.83)}$	$0.002_{(0,0.36)}$
V_{CE}^1	$2.6_{(0.5,5.6)}$	$2_{(0.8,4.3)}$	$0_{(0,0.6)}$	$3.8_{(1.4,8.4)}$

Note: All variance components were estimated from mixed effects models. Subscript values in parentheses represent 95% credible intervals around the estimate. V_A, V_M, V_P, V_{CE}, are, respectively the additive genetic, maternal, phenotypic and common environmental variances. m^2 is the ratio of the maternal variance to the total phenotypic variance. Cov_A and Cov_M are the covariances across environments in additive genetic and maternal effects, respectively. The traits BL, HD, BD, CP, and CAUD are, respectively, body length, head depth, body depth, caudal peduncle depth, and caudal peduncle length (see, Figure 2). *For convenience, we multiplied variance components by 100. [1]Common environmental effects were channel specific and therefore not estimated separately in each treatment.

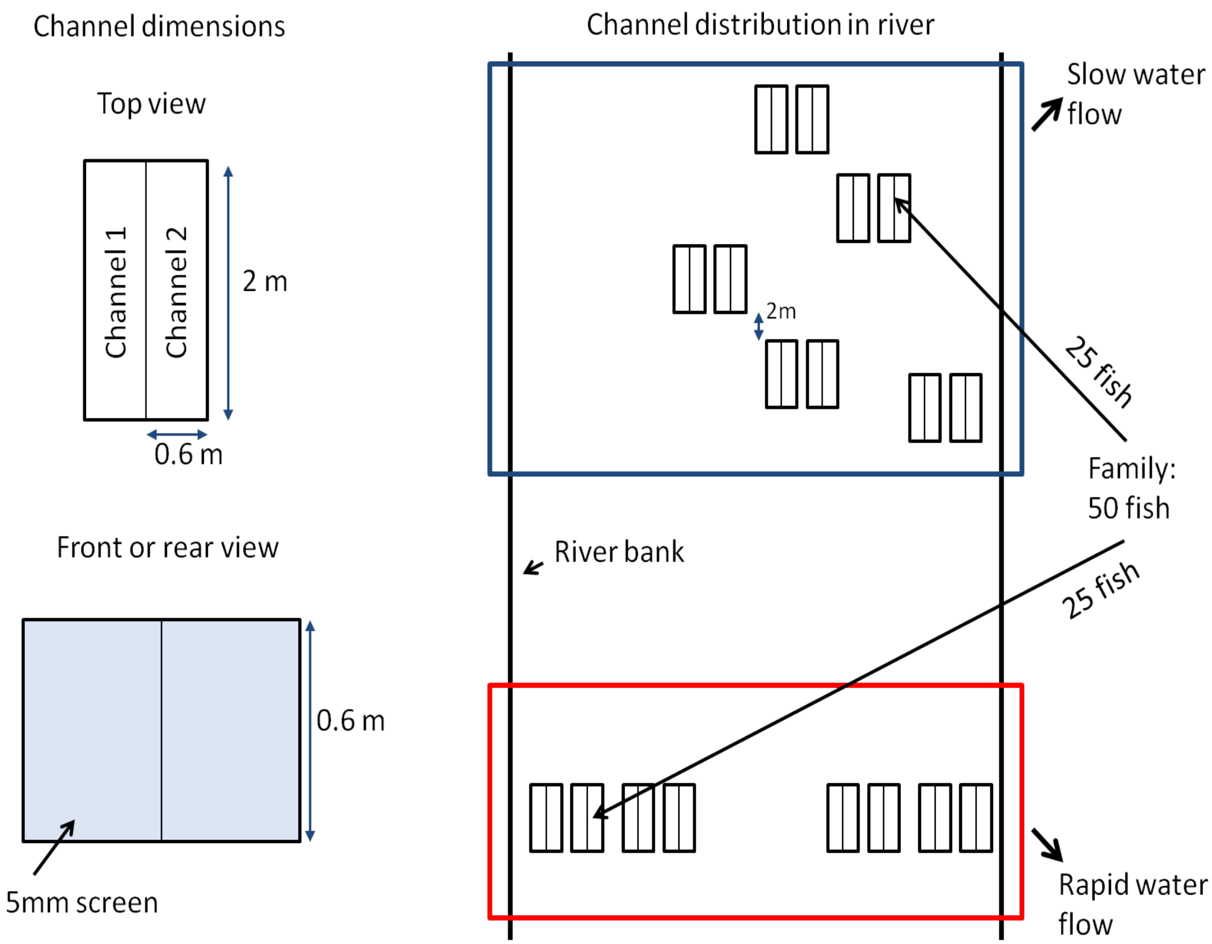

Figure S1: Sketch of channel design (Left) and experimental setup in the field (Right) for a hypothetical strech of river containing slow water flow (blue) and fast water flow (red). Individuals from a given family were allocated at random to an experimental channel. We also assured that all channels were at least $1m$ away from the river bank. The floor of each channels was lined with substrate collected from the river and within each channel we placed six large rocks to provide additional fish shelter.

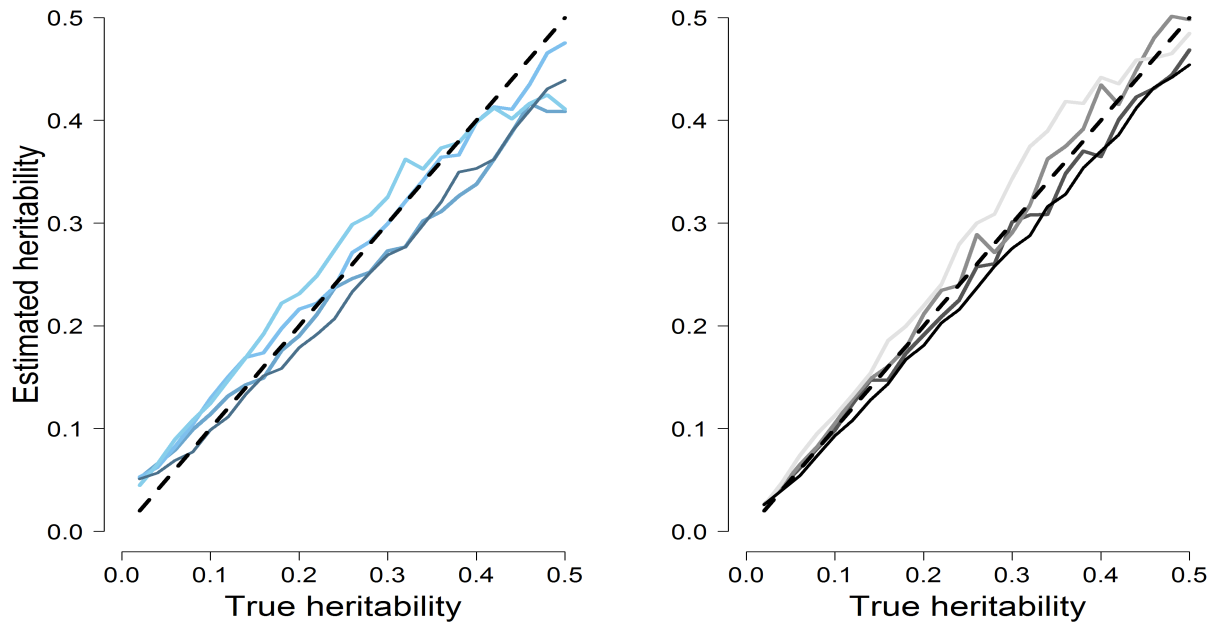

Figure S2: Potential biases in the estimation of casual components of variation due to our pedigree design. In both panels, the 1 : 1 dotted line is the expectation under no bias, whereas the slate blue and black-grey lines are heritability estimates made on simulated data using the pedigrees from the rapid and slow water flows, respectively. Within each panel, line color gradients from dark to light, represent different assumptions of maternal effects (such that maternal effects = 0, 0.15, 0.30, and 0.50).

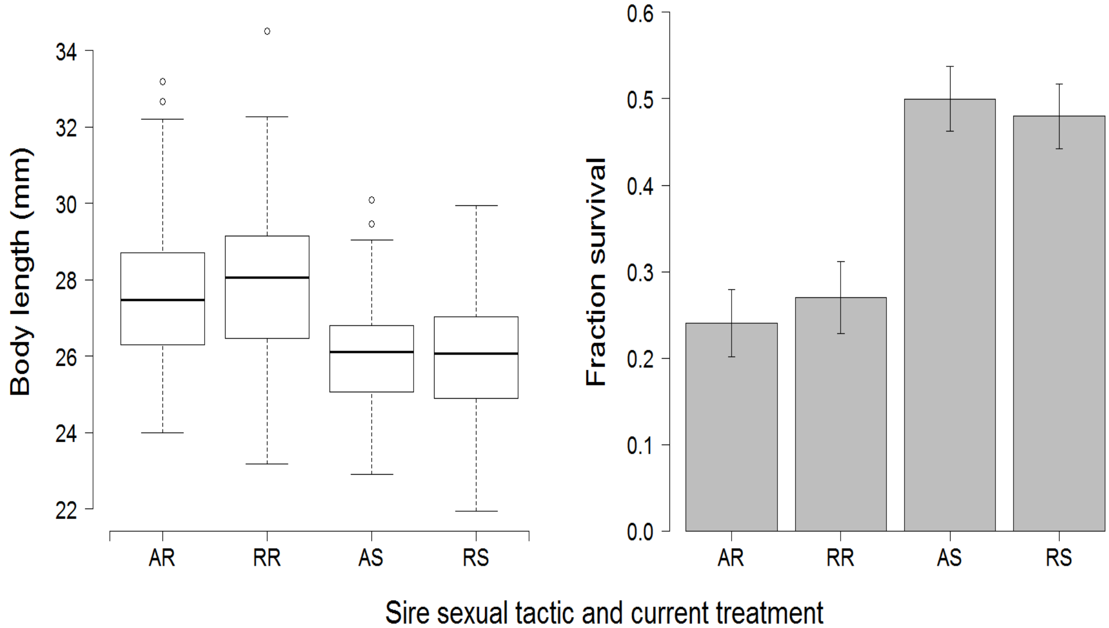

Figure S3: Comparison of body length and fraction survival between individuals sired by different paternal sexual tactics. AR and RR corresponds to offspring reared in the rapid water flow and sired from anadromous and resident males. AS and RS correspond to offspring reared in the slow water flow. Note that similar results were obtained for the other morphological traits.