

Supplementary File: Svanbäck and Johansson

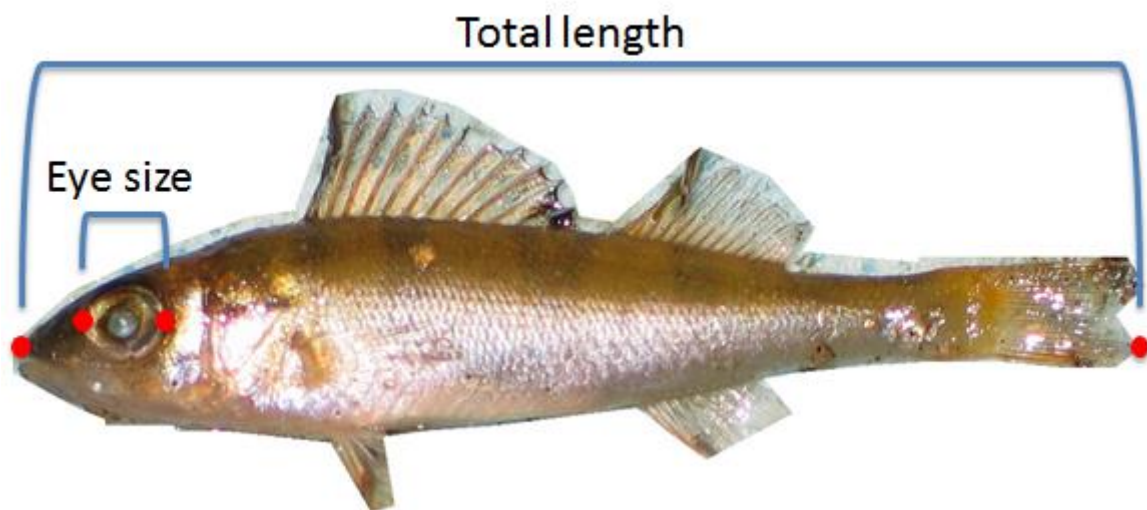


Figure S1. Landmarks digitized for measuring Eye size and Total length.

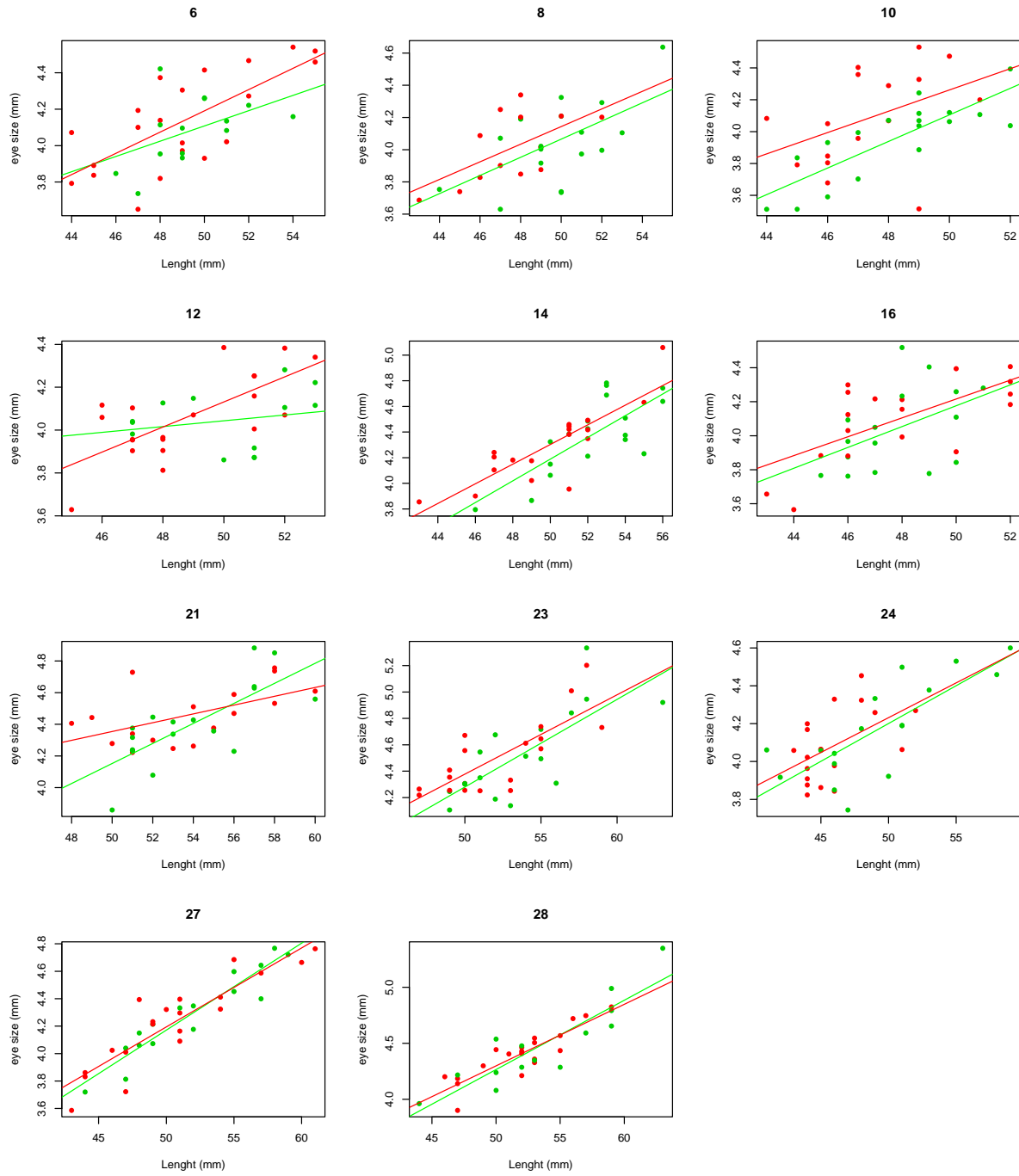


Figure S2. Relationship between eye size and total length for the fish in the open water trials in the predation experiment. Red symbols represent individuals that were eaten during the trial and green symbols, individuals surviving. The number above each plot represent the trial number.

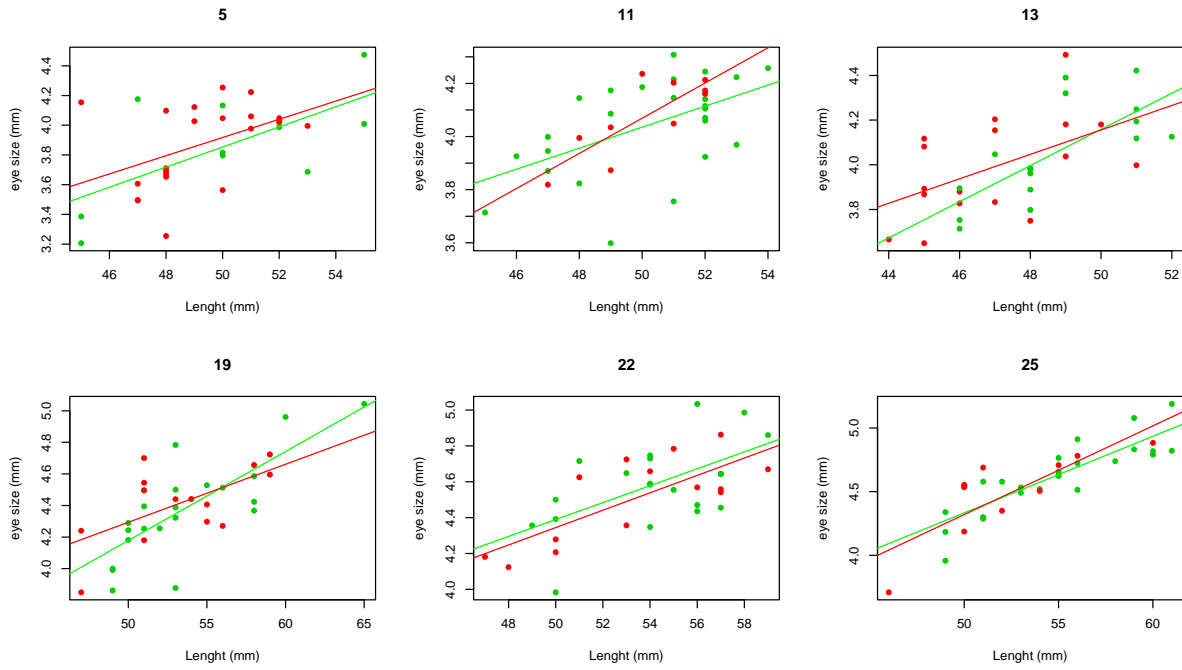


Figure S3. Relationship between eye size and total length for the fish in the vegetation trials in the predation experiment. Red symbols represent individuals that were eaten during the trial and green symbols, individuals surviving. The number above each plot represent the trial number.

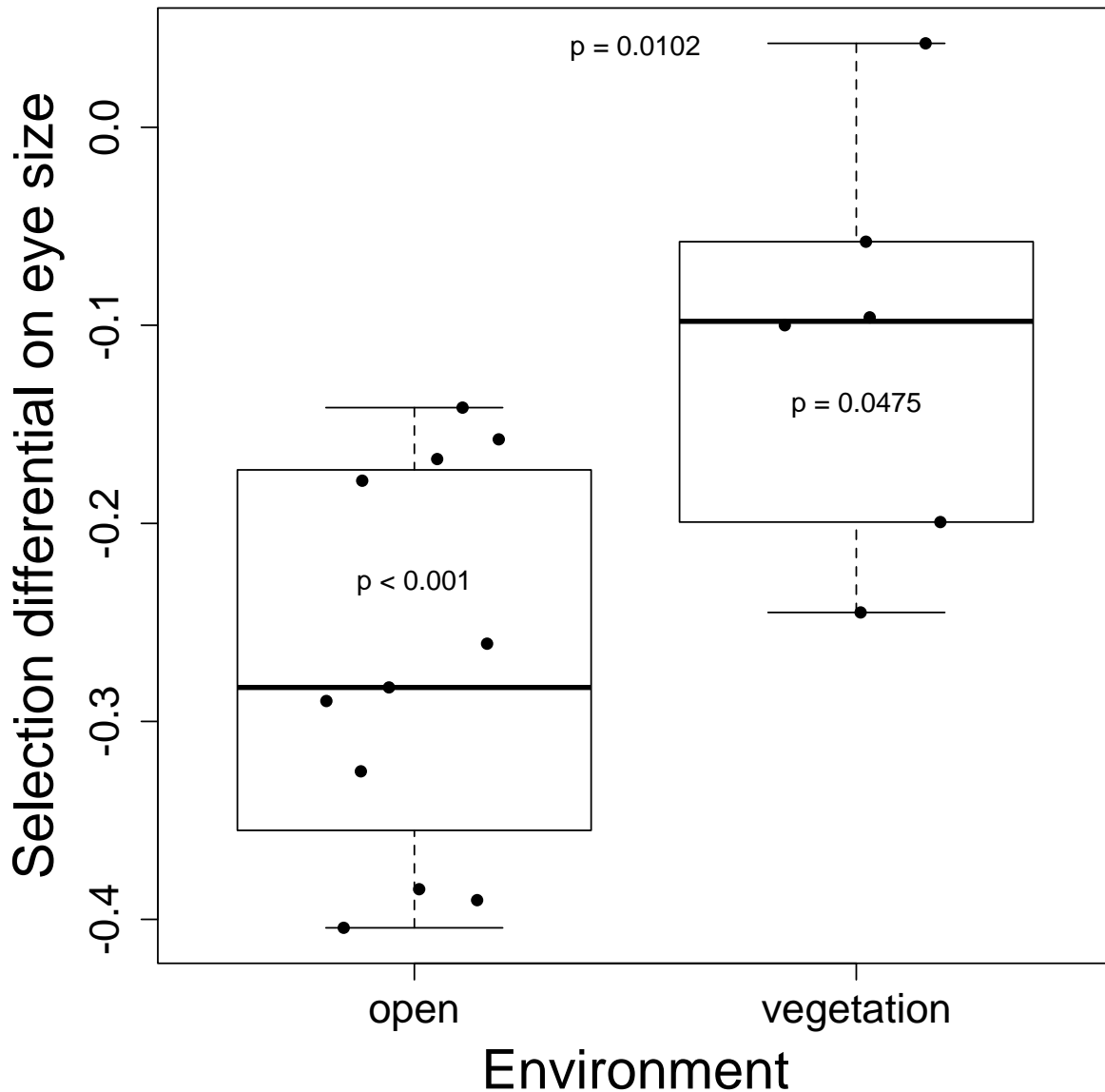


Figure S4. Box plots of selection differential on standardized relative eye size for the fish in the vegetation trials in the predation experiment. Points show individual trials' (experimental tanks) selection differentials. P-values inside a box shows whether the average selection gradient is different from zero and p-values between the boxes shows whether there were differences in selection between the environments.

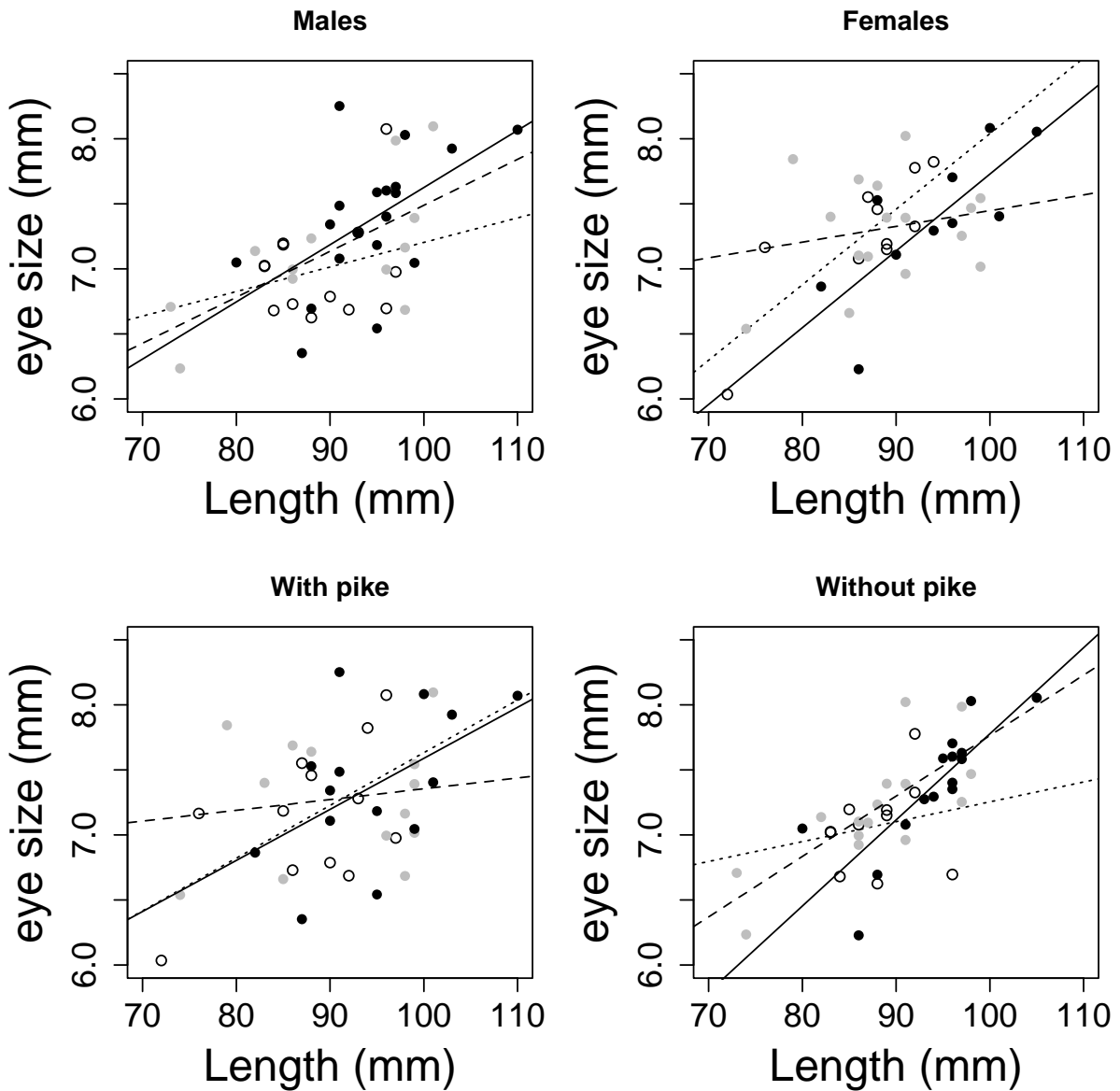


Figure S5. Visualizations of the two significant three-way interactions in the plasticity experiment from the nested anova on eye size (see Table S4). Top row shows the significant sex \times ration \times length interaction ($p = 0.0233$), divided by males (top left) and females (top right). Bottom row shows the marginally insignificant pike \times sex \times length interaction ($p = 0.0520$) divided by with pike treatments (bottom left) and without pike treatments (bottom right). Open symbols and dotted lines represent low food ration treatments, grey symbols and hatched lines represent medium ration treatments and black symbols and full drawn lines represent high food ration treatments.

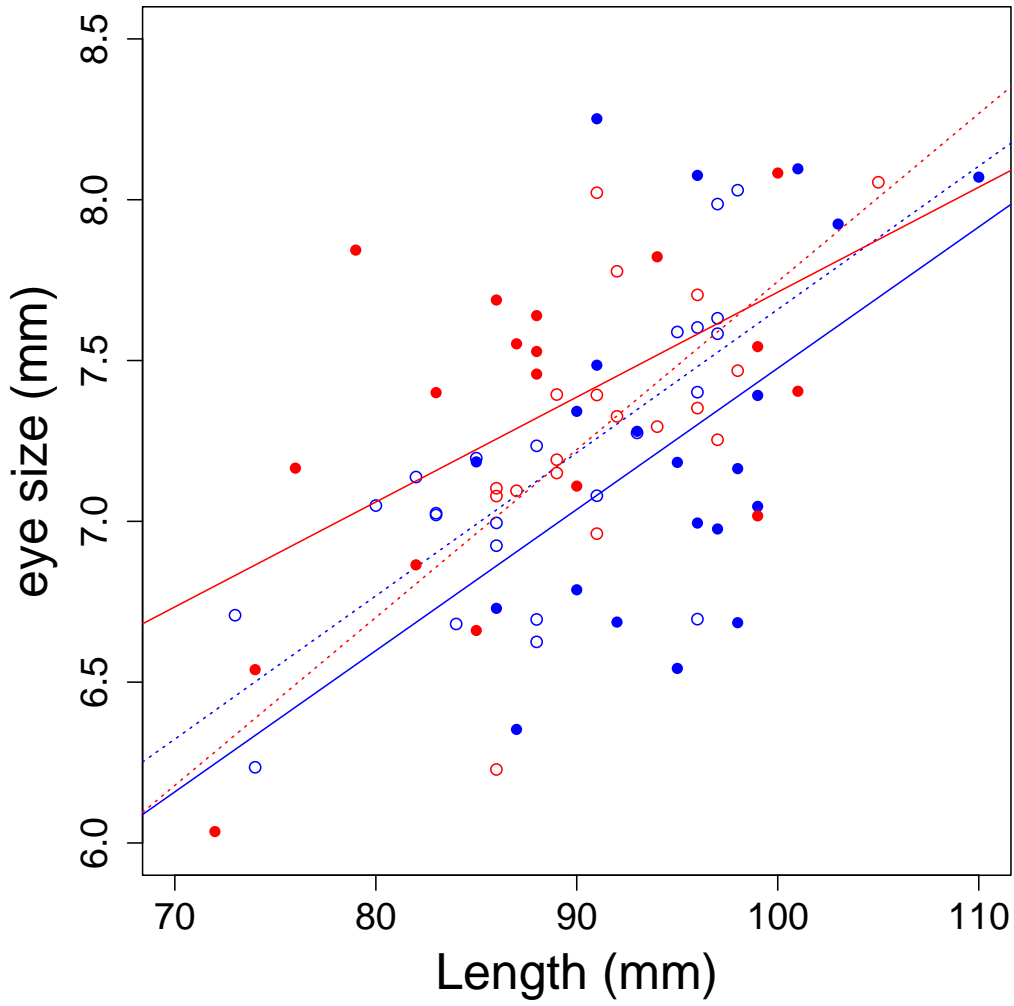


Figure S6. Differences in eye size from the plasticity experiment in relation to body size between males (blue symbols and lines) and females (red symbols and lines) raised with predators (filled symbols and full drawn lines) and without (open symbols and dotted lines).

Table S1. Estimated standard errors for the slope of from the logistic regression analyses of natural selection for each trial in the predator selection experiment for eye size (E) and length (L), and the quadratic (E × E, and L × L) and correlational (E × L) selection gradients for each experimental replicate for trials done in open water and vegetation.

Environment	E	L	E×E	L×L	E×L
Open water					
Trial #6	0.537	0.589	0.655	0.660	1.115
Trial #8	0.568	0.624	0.633	0.750	1.033
Trial #10	1.005	0.944	0.798	0.840	1.339
Trial #12	0.638	0.511	0.669	0.685	0.891
Trial #14	0.746	0.881	0.904	1.137	1.930
Trial #16	0.553	0.670	0.503	0.910	0.888
Trial #21	0.659	0.551	0.578	0.518	0.851
Trial #23	0.697	0.642	0.717	0.738	1.506
Trial #24	0.944	0.845	1.379	1.473	2.502
Trial #27	1.222	1.271	2.894	3.268	6.029
Trial #28	1.003	0.984	2.059	2.139	4.007
Vegetation					
Trial #5	0.621	0.570	0.624	0.480	0.628
Trial #11	1.159	1.146	1.881	2.193	3.443
Trial #13	0.635	0.852	0.667	0.838	1.424
Trial #19	0.557	0.543	0.537	0.737	0.998
Trial #22	0.556	0.522	0.775	0.819	1.358
Trial #25	0.856	0.880	1.481	1.182	2.758

Table S2. Summary statistics from mixed effect logistic regression models testing the effects of eye size and fish length on survival in open water and in vegetation, and if the effects are different between the two environments (open water and vegetation).

Factor	Chi-sq	Df	P
Open water			
Eye size (E)	27.20	1	<0.001
Length (L)	13.55	1	<0.001
E × E	0.65	1	0.420
L × L	0.31	1	0.580
E × L	0.02	1	0.898
Vegetation			
E	4.45	1	0.035
L	0.48	1	0.487
E × E	0.67	1	0.413
L × L	0.79	1	0.372
E × L	0.31	1	0.578
Open water vs Vegetation			
E	31.60	2	<0.001
L	13.77	2	0.001
E × E	2.65	2	0.263
L × L	1.06	2	0.588
E × L	0.41	2	0.814

Table S3. Summary statistic from selection experiment of mean \pm SE of A) relative eye size and B) Body size at the beginning of the experiment (before selection) and for the surviving and dead individuals at the end of the experiment (after selection).

Environment	Before selection		After selection			
	Mean	SE	Alive		Dead	
	Mean	SE	Mean	SE	Mean	SE
A) Relative Eye Size (to body size)						
Open water						
Trial #6	0.08374	0.00068	0.08269	0.00098	0.08445	0.00091
Trial #8	0.08274	0.00074	0.08151	0.00101	0.08432	0.00099
Trial #10	0.08403	0.00084	0.08204	0.00069	0.08627	0.00144
Trial #12	0.08232	0.00063	0.08089	0.00113	0.08324	0.00068
Trial #14	0.08496	0.00059	0.08380	0.00086	0.08612	0.00074
Trial #16	0.08518	0.00073	0.08457	0.00112	0.08572	0.00097
Trial #21	0.08240	0.00067	0.08168	0.00075	0.08316	0.00114
Trial #23	0.08550	0.00068	0.08434	0.00101	0.08653	0.00086
Trial #24	0.08718	0.00090	0.08509	0.00141	0.08905	0.00100
Trial #27	0.08339	0.00054	0.08288	0.00064	0.08380	0.00083
Trial #28	0.08454	0.00058	0.08396	0.00108	0.08494	0.00066
Vegetation						
Trial #5	0.07814	0.00095	0.07706	0.00183	0.07863	0.00112
Trial #11	0.08089	0.00055	0.08070	0.00074	0.08136	0.00057
Trial #13	0.08415	0.00065	0.08323	0.00076	0.08502	0.00102
Trial #19	0.08234	0.00074	0.08192	0.00087	0.08301	0.00133
Trial #22	0.08468	0.00068	0.08485	0.00098	0.08446	0.00094
Trial #25	0.08486	0.00055	0.08453	0.00062	0.08562	0.00117
B) Body size (Length, mm)						
Open water						
Trial #6	49.17	0.48	49.42	0.56	49.00	0.72
Trial #8	48.81	0.45	49.72	0.59	47.64	0.59
Trial #10	47.82	0.37	48.22	0.56	47.37	0.47
Trial #12	49.33	0.40	50.07	0.62	48.85	0.52
Trial #14	51.05	0.51	52.22	0.60	49.88	0.75
Trial #16	47.82	0.41	47.81	0.45	47.83	0.68
Trial #21	53.80	0.54	53.83	0.71	53.76	0.85
Trial #23	52.88	0.62	53.70	0.93	52.15	0.83
Trial #24	47.50	0.70	49.29	1.22	45.89	0.58
Trial #27	51.11	0.80	51.75	1.14	50.60	1.12
Trial #28	52.61	0.74	53.57	1.42	51.95	0.78
Vegetation						
Trial #5	49.56	0.46	50.20	1.16	49.27	0.44
Trial #11	50.11	0.38	50.12	0.49	50.10	0.56
Trial #13	47.78	0.38	48.68	0.49	46.94	0.50
Trial #19	53.44	0.66	53.50	0.88	53.35	1.05
Trial #22	53.85	0.55	54.05	0.67	53.60	0.95
Trial #25	54.02	0.65	54.64	0.78	52.63	1.15

Table S4. Results from Nested ANCOVA on the effects on raw eye size from the plasticity experiment using length as a covariate.

Treatment	Df	F-value	p-value
pike	1,30	0.33	0.5690
sex	1,28	2.66	0.1141
ration	2,30	2.25	0.1229
length	1,28	35.69	<.0001
pike × sex	1,28	3.64	0.0667
pike × ration	2,30	0.31	0.7361
sex × ration	2,28	1.30	0.2888
pike × length	1,28	0.12	0.7269
sex × length	1,28	0.00	0.9737
ration × length	2,28	1.07	0.3572
pike × sex × ration	2,28	0.44	0.6476
pike × sex × length	1,28	0.37	0.5485
pike × ration × length	2,28	3.29	0.0520
sex × ration × length	2,28	4.31	0.0233