

**Table S1.** Fish sampling results separated by river and sample section.

River	Section	Genus	Species	N	River	Section	Genus	Species	N
Tygart Valley	Discharge	<i>Cyprinella</i>	<i>spiloptera</i>	23	West Fork	Discharge	<i>Etheostoma</i>	<i>blennioides</i>	1
		<i>Lepomis</i>	<i>cyanellus</i>	2				<i>flabellare</i>	1
			<i>gibbosus</i>	26				<i>nigrum</i>	8
			<i>macrochirus</i>	16			<i>Lepomis</i>	<i>gibbosus</i>	1
			<i>megalotis</i>	1				<i>macrochirus</i>	17
		<i>Micropterus</i>	<i>salmoides</i>	1			<i>Micropterus</i>	<i>salmoides</i>	1
		<i>Notemignous</i>	<i>crysoleucas</i>	21			<i>Notemignous</i>	<i>crysoleucas</i>	43
		<i>Notropis</i>	<i>stramineus</i>	6			<i>Pimephales</i>	<i>notatus</i>	49
		<i>Pimephales</i>	<i>notatus</i>	22				<b>Total</b>	<b>121</b>
			<b>Total</b>	<b>118</b>		Downstream	<i>Etheostoma</i>	<i>nigrum</i>	1
	Downstream	<i>Lepomis</i>	<i>cyanellus</i>	3			<i>Lepomis</i>	<i>cyanellus</i>	13
			<i>gibbosus</i>	19				<i>gibbosus</i>	2
			<i>macrochirus</i>	77				<i>macrochirus</i>	36
		<i>Micropterus</i>	<i>dolomieu</i>	2			<i>Micropterus</i>	<i>salmoides</i>	20
			<i>salmoides</i>	1			<i>Pimephales</i>	<i>notatus</i>	68
		<i>Notemignous</i>	<i>crysoleucas</i>	46				<b>Total</b>	<b>140</b>
		<i>Notropis</i>	<i>stramineus</i>	78		Upstream	<i>Cyprinella</i>	<i>spiloptera</i>	7
		<i>Pimephales</i>	<i>notatus</i>	29			<i>Etheostoma</i>	<i>blennioides</i>	2
			<b>Total</b>	<b>255</b>				<i>nigrum</i>	2
	Upstream	<i>Cyprinella</i>	<i>spiloptera</i>	35			<i>Lepomis</i>	<i>cyanellus</i>	11
		<i>Lepomis</i>	<i>cyanellus</i>	2				<i>gibbosus</i>	1
			<i>gibbosus</i>	44				<i>macrochirus</i>	14
			<i>macrochirus</i>	46			<i>Micropterus</i>	<i>dolomieu</i>	14
			<i>megalotis</i>	1				<i>salmoides</i>	1
		<i>Notemignous</i>	<i>crysoleucas</i>	49			<i>Pimephales</i>	<i>notatus</i>	93
		<i>Notropis</i>	<i>stramineus</i>	10				<b>Total</b>	<b>145</b>
		<i>Pimephales</i>	<i>notatus</i>	52					
			<b>Total</b>	<b>239</b>					

**Table S2.** Tukey HSD post hoc comparisons of differences in  $W_r$  based on genus.

Genus Comparisons	Difference	Lower	Upper	P-value adj
Etheostoma–Cyprinella	3.868	-7.289	15.025	0.948
Lepomis–Cyprinella	5.713	0.430	10.996	0.024 *
Micropterus–Cyprinella	17.681	9.854	25.509	<0.001 ***
Notemignous–Cyprinella	-0.385	-6.119	5.349	1.000
Notropis–Cyprinella	9.171	2.887	15.454	<0.001 ***
Pimephales–Cyprinella	23.761	18.452	29.070	<0.001 ***
Lepomis–Etheostoma	1.845	-8.436	12.126	0.998
Micropterus–Etheostoma	13.814	2.021	25.606	0.010 *
Notemignous–Etheostoma	-4.253	-14.773	6.268	0.896
Notropis–Etheostoma	5.303	-5.527	16.132	0.776
Pimephales–Etheostoma	19.893	9.599	30.188	<0.001 ***
Micropterus–Lepomis	11.969	5.450	18.487	<0.001 ***
Notemignous–Lepomis	-6.097	-9.854	-2.341	<0.001 ***
Notropis–Lepomis	3.458	-1.093	8.008	0.273
Pimephales–Lepomis	18.048	14.980	21.117	<0.001 ***
Notemignous–Micropterus	-18.066	-24.956	-11.177	<0.001 ***
Notropis–Micropterus	-8.511	-15.864	-1.158	0.012 *

Pimephales–Micropterus	6.080	-0.460	12.620	0.088	.
Notropis–Notemignous	9.555	4.488	14.623	<0.001	***
Pimephales–Notemignous	24.146	20.353	27.939	<0.001	***
Pimephales–Notropis	14.591	10.010	19.172	<0.001	***

**Table S3.** Tukey HSD post hoc comparison of differences in Wr based on the ‘section:genus’ interaction term.

Section:Genus Comparisons	Wr Difference	Lower	Upper	P-value adj	
Discharge:Cyprinella–Upstream:Cyprinella	-0.225	-12.464	12.014	1.000	
Upstream:Etheostoma–Upstream:Cyprinella	10.467	-14.222	35.156	0.996	
Discharge:Etheostoma–Upstream:Cyprinella	-0.695	-17.297	15.907	1.000	
Downstream:Etheostoma–Upstream:Cyprinella	24.991	-22.750	72.732	0.954	
Upstream:Lepomis–Upstream:Cyprinella	5.535	-2.934	14.003	0.730	
Discharge:Lepomis–Upstream:Cyprinella	7.134	-2.264	16.533	0.440	
Downstream:Lepomis–Upstream:Cyprinella	5.114	-3.123	13.351	0.807	
Upstream:Micropterus–Upstream:Cyprinella	12.829	-1.363	27.021	0.139	
Discharge:Micropterus–Upstream:Cyprinella	16.546	-17.602	50.694	0.979	
Downstream:Micropterus–Upstream:Cyprinella	20.740	8.501	32.979	<0.001	***
Upstream:Notemignous–Upstream:Cyprinella	-4.358	-14.280	5.563	0.993	
Discharge:Notemignous–Upstream:Cyprinella	-0.011	-9.381	9.358	1.000	
Downstream:Notemignous–Upstream:Cyprinella	3.408	-6.662	13.477	1.000	
Upstream:Notropis–Upstream:Cyprinella	24.805	8.203	41.407	<0.001	***
Discharge:Notropis–Upstream:Cyprinella	39.026	18.434	59.618	<0.001	***
Downstream:Notropis–Upstream:Cyprinella	4.815	-4.215	13.845	0.945	
Upstream:Pimephales–Upstream:Cyprinella	21.183	12.915	29.451	<0.001	***
Discharge:Pimephales–Upstream:Cyprinella	27.175	17.990	36.359	<0.001	***
Downstream:Pimephales–Upstream:Cyprinella	24.865	16.150	33.580	<0.001	***
Upstream:Etheostoma–Discharge:Cyprinella	10.692	-14.868	36.252	0.996	
Discharge:Etheostoma–Discharge:Cyprinella	-0.470	-18.342	17.402	1.000	
Downstream:Etheostoma–Discharge:Cyprinella	25.216	-22.981	73.413	0.954	
Upstream:Lepomis–Discharge:Cyprinella	5.760	-4.987	16.506	0.942	
Discharge:Lepomis–Discharge:Cyprinella	7.359	-4.135	18.854	0.763	
Downstream:Lepomis–Discharge:Cyprinella	5.339	-5.227	15.904	0.968	
Upstream:Micropterus–Discharge:Cyprinella	13.054	-2.605	28.713	0.259	
Discharge:Micropterus–Discharge:Cyprinella	16.771	-18.012	51.554	0.980	
Downstream:Micropterus–Discharge:Cyprinella	20.965	7.051	34.878	<0.001	***
Upstream:Notemignous–Discharge:Cyprinella	-4.133	-16.059	7.792	1.000	
Discharge:Notemignous–Discharge:Cyprinella	0.214	-11.257	11.684	1.000	
Downstream:Notemignous–Discharge:Cyprinella	3.632	-8.417	15.682	1.000	
Upstream:Notropis–Discharge:Cyprinella	25.030	7.158	42.902	<0.001	***
Discharge:Notropis–Discharge:Cyprinella	39.251	17.622	60.880	<0.001	***
Downstream:Notropis–Discharge:Cyprinella	5.040	-6.155	16.235	0.991	
Upstream:Pimephales–Discharge:Cyprinella	21.408	10.818	31.998	<0.001	***
Discharge:Pimephales–Discharge:Cyprinella	27.399	16.079	38.720	<0.001	***
Downstream:Pimephales–Discharge:Cyprinella	25.090	14.147	36.032	<0.001	***
Discharge:Etheostoma–Upstream:Etheostoma	-11.162	-39.075	16.751	0.998	
Downstream:Etheostoma–Upstream:Etheostoma	14.524	-38.227	67.275	1.000	
Upstream:Lepomis–Upstream:Etheostoma	-4.932	-28.917	19.052	1.000	
Discharge:Lepomis–Upstream:Etheostoma	-3.333	-27.661	20.996	1.000	
Downstream:Lepomis–Upstream:Etheostoma	-5.353	-29.257	18.550	1.000	

Upstream:Micropterus–Upstream:Etheostoma	2.362	-24.189	28.913	1.000	
Discharge:Micropterus–Upstream:Etheostoma	6.079	-34.782	46.940	1.000	
Downstream:Micropterus–Upstream:Etheostoma	10.273	-15.288	35.833	0.998	
Upstream:Notemignous–Upstream:Etheostoma	-14.825	-39.360	9.710	0.841	
Discharge:Notemignous–Upstream:Etheostoma	-10.478	-34.795	13.839	0.995	
Downstream:Notemignous–Upstream:Etheostoma	-7.060	-31.655	17.536	1.000	
Upstream:Notropis–Upstream:Etheostoma	14.338	-13.575	42.251	0.962	
Discharge:Notropis–Upstream:Etheostoma	28.559	-1.897	59.015	0.099	.
Downstream:Notropis–Upstream:Etheostoma	-5.652	-29.841	18.536	1.000	
Upstream:Pimephales–Upstream:Etheostoma	10.716	-13.198	34.630	0.992	
Discharge:Pimephales–Upstream:Etheostoma	16.707	-7.539	40.954	0.635	
Downstream:Pimephales–Upstream:Etheostoma	14.398	-9.675	38.470	0.853	
Downstream:Etheostoma–Discharge:Etheostoma	25.686	-23.799	75.171	0.958	
Upstream:Lepomis–Discharge:Etheostoma	6.230	-9.305	21.764	0.998	
Discharge:Lepomis–Discharge:Etheostoma	7.829	-8.232	23.890	0.978	
Downstream:Lepomis–Discharge:Etheostoma	5.809	-9.601	21.218	0.999	
Upstream:Micropterus–Discharge:Etheostoma	13.524	-5.738	32.786	0.599	
Discharge:Micropterus–Discharge:Etheostoma	17.241	-19.306	53.788	0.985	
Downstream:Micropterus–Discharge:Etheostoma	21.434	3.563	39.306	0.003	**
Upstream:Notemignous–Discharge:Etheostoma	-3.663	-20.036	12.709	1.000	
Discharge:Notemignous–Discharge:Etheostoma	0.684	-15.360	16.727	1.000	
Downstream:Notemignous–Discharge:Etheostoma	4.102	-12.360	20.565	1.000	
Upstream:Notropis–Discharge:Etheostoma	25.500	4.399	46.601	0.003	**
Discharge:Notropis–Discharge:Etheostoma	39.721	15.356	64.086	<0.001	***
Downstream:Notropis–Discharge:Etheostoma	5.510	-10.338	21.358	1.000	
Upstream:Pimephales–Discharge:Etheostoma	21.878	6.452	37.304	<0.001	***
Discharge:Pimephales–Discharge:Etheostoma	27.869	11.933	43.806	<0.001	***
Downstream:Pimephales–Discharge:Etheostoma	25.560	9.889	41.230	<0.001	***
Upstream:Lepomis–Downstream:Etheostoma	-19.456	-66.836	27.924	0.997	
Discharge:Lepomis–Downstream:Etheostoma	-17.857	-65.412	29.699	0.999	
Downstream:Lepomis–Downstream:Etheostoma	-19.877	-67.216	27.462	0.996	
Upstream:Micropterus–Downstream:Etheostoma	-12.162	-60.891	36.568	1.000	
Discharge:Micropterus–Downstream:Etheostoma	-8.445	-66.231	49.342	1.000	
Downstream:Micropterus–Downstream:Etheostoma	-4.251	-52.448	43.946	1.000	
Upstream:Notemignous–Downstream:Etheostoma	-29.349	-77.010	18.312	0.818	
Discharge:Notemignous–Downstream:Etheostoma	-25.002	-72.552	22.547	0.952	
Downstream:Notemignous–Downstream:Etheostoma	-21.583	-69.276	26.109	0.991	
Upstream:Notropis–Downstream:Etheostoma	-0.186	-49.671	49.299	1.000	
Discharge:Notropis–Downstream:Etheostoma	14.035	-36.927	64.998	1.000	
Downstream:Notropis–Downstream:Etheostoma	-20.176	-67.660	27.308	0.996	
Upstream:Pimephales–Downstream:Etheostoma	-3.808	-51.152	43.537	1.000	
Discharge:Pimephales–Downstream:Etheostoma	2.184	-45.330	49.697	1.000	
Downstream:Pimephales–Downstream:Etheostoma	-0.126	-47.551	47.299	1.000	
Discharge:Lepomis–Upstream:Lepomis	1.600	-5.752	8.951	1.000	
Downstream:Lepomis–Upstream:Lepomis	-0.421	-6.213	5.371	1.000	
Upstream:Micropterus–Upstream:Lepomis	7.295	-5.633	20.222	0.908	
Discharge:Micropterus–Upstream:Lepomis	11.012	-22.630	44.654	1.000	
Downstream:Micropterus–Upstream:Lepomis	15.205	4.458	25.952	<0.001	***
Upstream:Notemignous–Upstream:Lepomis	-9.893	-17.902	-1.884	0.002	**
Discharge:Notemignous–Upstream:Lepomis	-5.546	-12.860	1.768	0.442	

Downstream:Notemignous–Upstream:Lepomis	-2.127	-10.319	6.064	1.000	
Upstream:Notropis–Upstream:Lepomis	19.270	3.736	34.805	0.002	**
Discharge:Notropis–Upstream:Lepomis	33.492	13.750	53.233	<0.001	***
Downstream:Notropis–Upstream:Lepomis	-0.720	-7.593	6.154	1.000	
Upstream:Pimephales–Upstream:Lepomis	15.649	9.812	21.485	<0.001	***
Discharge:Pimephales–Upstream:Lepomis	21.640	14.565	28.715	<0.001	***
Downstream:Pimephales–Upstream:Lepomis	19.330	12.876	25.784	<0.001	***
Downstream:Lepomis–Discharge:Lepomis	-2.021	-9.104	5.063	1.000	
Upstream:Micropterus–Discharge:Lepomis	5.695	-7.861	19.250	0.996	
Discharge:Micropterus–Discharge:Lepomis	9.412	-24.476	43.300	1.000	
Downstream:Micropterus–Discharge:Lepomis	13.605	2.111	25.100	0.004	**
Upstream:Notemignous–Discharge:Lepomis	-11.493	-20.480	-2.506	0.001	**
Discharge:Notemignous–Discharge:Lepomis	-7.146	-15.519	1.228	0.220	
Downstream:Notemignous–Discharge:Lepomis	-3.727	-12.877	5.424	0.997	
Upstream:Notropis–Discharge:Lepomis	17.671	1.610	33.732	0.014	*
Discharge:Notropis–Discharge:Lepomis	31.892	11.733	52.050	<0.001	***
Downstream:Notropis–Discharge:Lepomis	-2.319	-10.312	5.673	1.000	
Upstream:Pimephales–Discharge:Lepomis	14.049	6.929	21.168	<0.001	***
Discharge:Pimephales–Discharge:Lepomis	20.040	11.874	28.207	<0.001	***
Downstream:Pimephales–Discharge:Lepomis	17.730	10.096	25.365	<0.001	***
Upstream:Micropterus–Downstream:Lepomis	7.715	-5.062	20.492	0.842	
Discharge:Micropterus–Downstream:Lepomis	11.432	-22.152	45.017	1.000	
Downstream:Micropterus–Downstream:Lepomis	15.626	5.060	26.191	<0.001	***
Upstream:Notemignous–Downstream:Lepomis	-9.472	-17.236	-1.709	0.003	**
Discharge:Notemignous–Downstream:Lepomis	-5.125	-12.170	1.919	0.527	
Downstream:Notemignous–Downstream:Lepomis	-1.706	-9.659	6.246	1.000	
Upstream:Notropis–Downstream:Lepomis	19.691	4.282	35.101	0.001	**
Discharge:Notropis–Downstream:Lepomis	33.912	14.269	53.556	<0.001	***
Downstream:Notropis–Downstream:Lepomis	-0.299	-6.885	6.288	1.000	
Upstream:Pimephales–Downstream:Lepomis	16.069	10.574	21.564	<0.001	***
Discharge:Pimephales–Downstream:Lepomis	22.061	15.264	28.857	<0.001	***
Downstream:Pimephales–Downstream:Lepomis	19.751	13.603	25.898	<0.001	***
Discharge:Micropterus–Upstream:Micropterus	3.717	-31.800	39.235	1.000	
Downstream:Micropterus–Upstream:Micropterus	7.910	-7.748	23.569	0.968	
Upstream:Notemignous–Upstream:Micropterus	-17.187	-31.110	-3.265	0.002	**
Discharge:Notemignous–Upstream:Micropterus	-12.840	-26.375	0.695	0.088	.
Downstream:Notemignous–Upstream:Micropterus	-9.422	-23.450	4.607	0.683	
Upstream:Notropis–Upstream:Micropterus	11.976	-7.286	31.238	0.805	
Discharge:Notropis–Upstream:Micropterus	26.197	3.406	48.988	0.007	**
Downstream:Notropis–Upstream:Micropterus	-8.014	-21.317	5.288	0.845	
Upstream:Pimephales–Upstream:Micropterus	8.354	-4.443	21.151	0.732	
Discharge:Pimephales–Upstream:Micropterus	14.345	0.938	27.753	0.021	*
Downstream:Pimephales–Upstream:Micropterus	12.035	-1.055	25.126	0.119	
Downstream:Micropterus–Discharge:Micropterus	4.193	-30.590	38.976	1.000	
Upstream:Notemignous–Discharge:Micropterus	-20.905	-54.942	13.132	0.821	
Discharge:Notemignous–Discharge:Micropterus	-16.558	-50.438	17.323	0.977	
Downstream:Notemignous–Discharge:Micropterus	-13.139	-47.219	20.942	0.999	
Upstream:Notropis–Discharge:Micropterus	8.259	-28.288	44.806	1.000	
Discharge:Notropis–Discharge:Micropterus	22.480	-16.044	61.004	0.879	
Downstream:Notropis–Discharge:Micropterus	-11.731	-45.519	22.056	1.000	

Upstream:Pimephales–Discharge:Micropterus	4.637	-28.955	38.229	1.000	
Discharge:Pimephales–Discharge:Micropterus	10.628	-23.201	44.458	1.000	
Downstream:Pimephales–Discharge:Micropterus	8.318	-25.387	42.023	1.000	
Upstream:Notemignous–Downstream:Micropterus	-25.098	-37.024	-13.172	<0.001	***
Discharge:Notemignous–Downstream:Micropterus	-20.751	-32.221	-9.280	<0.001	***
Downstream:Notemignous–Downstream:Micropterus	-17.332	-29.381	-5.283	<0.001	***
Upstream:Notropis–Downstream:Micropterus	4.065	-13.806	21.937	1.000	
Discharge:Notropis–Downstream:Micropterus	18.287	-3.342	39.916	0.235	
Downstream:Notropis–Downstream:Micropterus	-15.925	-27.120	-4.730	<0.001	***
Upstream:Pimephales–Downstream:Micropterus	0.444	-10.146	11.033	1.000	
Discharge:Pimephales–Downstream:Micropterus	6.435	-4.885	17.755	0.902	
Downstream:Pimephales–Downstream:Micropterus	4.125	-6.818	15.068	0.999	
Discharge:Notemignous–Upstream:Notemignous	4.347	-4.609	13.303	0.979	
Downstream:Notemignous–Upstream:Notemignous	7.766	-1.921	17.452	0.330	
Upstream:Notropis–Upstream:Notemignous	29.163	12.791	45.536	<0.001	***
Discharge:Notropis–Upstream:Notemignous	43.385	22.977	63.792	<0.001	***
Downstream:Notropis–Upstream:Notemignous	9.173	0.572	17.774	0.022	*
Upstream:Pimephales–Upstream:Notemignous	25.541	17.745	33.338	<0.001	***
Discharge:Pimephales–Upstream:Notemignous	31.533	22.770	40.296	<0.001	***
Downstream:Pimephales–Upstream:Notemignous	29.223	20.954	37.492	<0.001	***
Downstream:Notemignous–Discharge:Notemignous	3.419	-5.702	12.539	0.999	
Upstream:Notropis–Discharge:Notemignous	24.816	8.773	40.860	<0.001	***
Discharge:Notropis–Discharge:Notemignous	39.038	18.893	59.182	<0.001	***
Downstream:Notropis–Discharge:Notemignous	4.826	-3.131	12.784	0.837	
Upstream:Pimephales–Discharge:Notemignous	21.194	14.114	28.275	<0.001	***
Discharge:Pimephales–Discharge:Notemignous	27.186	19.053	35.318	<0.001	***
Downstream:Pimephales–Discharge:Notemignous	24.876	17.278	32.474	<0.001	***
Upstream:Notropis–Downstream:Notemignous	21.398	4.935	37.860	0.001	**
Discharge:Notropis–Downstream:Notemignous	35.619	15.139	56.099	<0.001	***
Downstream:Notropis–Downstream:Notemignous	1.407	-7.364	10.179	1.000	
Upstream:Pimephales–Downstream:Notemignous	17.776	9.791	25.760	<0.001	***
Discharge:Pimephales–Downstream:Notemignous	23.767	14.837	32.697	<0.001	***
Downstream:Pimephales–Downstream:Notemignous	21.457	13.011	29.904	<0.001	***
Discharge:Notropis–Upstream:Notropis	14.221	-10.144	38.586	0.879	
Downstream:Notropis–Upstream:Notropis	-19.990	-35.838	-4.142	0.001	**
Upstream:Pimephales–Upstream:Notropis	-3.622	-19.048	11.804	1.000	
Discharge:Pimephales–Upstream:Notropis	2.369	-13.567	18.306	1.000	
Downstream:Pimephales–Upstream:Notropis	0.060	-15.611	15.730	1.000	
Downstream:Notropis–Discharge:Notropis	-34.211	-54.201	-14.222	<0.001	***
Upstream:Pimephales–Discharge:Notropis	-17.843	-37.500	1.813	0.134	
Discharge:Pimephales–Discharge:Notropis	-11.852	-31.911	8.208	0.866	
Downstream:Pimephales–Discharge:Notropis	-14.162	-34.011	5.687	0.567	
Upstream:Pimephales–Downstream:Notropis	16.368	9.743	22.993	<0.001	***
Discharge:Pimephales–Downstream:Notropis	22.360	14.620	30.099	<0.001	***
Downstream:Pimephales–Downstream:Notropis	20.050	12.874	27.225	<0.001	***
Discharge:Pimephales–Upstream:Pimephales	5.991	-0.843	12.826	0.179	
Downstream:Pimephales–Upstream:Pimephales	3.681	-2.507	9.870	0.859	
Downstream:Pimephales–Discharge:Pimephales	-2.310	-9.679	5.059	1.000	