

Table S1. Average mass of individuals captured, proportion of wet mass to dry mass, and proportion of carbon, nitrogen, and phosphorus for each species. Stoichiometric proportions were taken from Knapp et al. (2021). *Anaxyrus terrestris* was detected in this study but not Knapp et al. (2021); therefore, we used stoichiometric measurements from Luhning et al. 2018.

Species	Average Mass Captured (g)	WM-DM Proportion	Proportion of Carbon	Proportion of Nitrogen	Proportion of Phosphorus
<i>Acris gryllus</i>	0.171	0.224	0.461	0.102	0.012
<i>Ambystoma talpoideum</i>	6.608	0.220	0.474	0.118	0.018
<i>Ambystoma tigrinum</i>	15.638	0.141	0.459	0.120	0.017
<i>Anaxyrus terrestris</i>	0.221	0.207	0.373	0.097	0.016
<i>Gastrophryne carolinensis</i>	0.165	0.172	0.408	0.102	0.018
<i>Hyla cinerea</i>	1.210	0.215	0.466	0.108	0.012
<i>Hyla gratiosa</i>	1.729	0.206	0.482	0.096	0.011
<i>Hyla squirella</i>	0.700	0.173	0.446	0.110	0.015
<i>Lithobates catesbeianus</i>	14.064	0.226	0.503	0.096	0.012
<i>Lithobates sphenoccephalus</i>	2.617	0.202	0.466	0.100	0.017
<i>Pseudacris nigrata</i>	0.249	0.245	0.465	0.105	0.011
<i>Pseudacris ornata</i>	0.636	0.244	0.477	0.107	0.009
<i>Scaphiopus holbrookii</i>	0.398	0.223	0.441	0.094	0.017

Table S2. Monthly environmental data from W51 and the on-site weather station used in the NMDS and manyGLM analyses. The Avg_Daily_Sq_Area is the average m2 of the wetland that was inundated over that month based on two measurements of staff gauge height extrapolated to a digital elevation model. Hydro_prop is the proportion of time during the month in which the wetland contained water. The Total_Monthly_Rain and the Avg_Daily_Temp represent the total rain received over that month (mm) and the average daily temperature (°C) during the sampling time period.

Year	Combined	Month	Avg_Daily_Sq_Area	Hydro_Prop	Total_Monthly_Rain	Avg_Daily_Temp
2003	January.2003	Jan	2903.14175	1	5.08	6.936161
2004	January.2004	Jan	2983.4316	1	92.708	8.714419
2005	January.2005	Jan	2697.6912	1	56.9	10.960129

2006	January.2006	Jan	4941.65655	1	181.582	12.62329
2007	January.2007	Jan	1982.4221	1	126.746	10.761452
2008	January.2008	Jan	1518.3948	1	85.858	8.532581
2009	January.2009	Jan	4474.78945	1	45.974	10.13729
2010	January.2010	Jan	7121.8804	1	197.316	6.650032
2011	January.2011	Jan	616.64665	1	112.78	6.60471
2003	February.2003	Feb	2129.1294	1	128.016	11.273143
2004	February.2004	Feb	4011.6243	1	160.784	9.413207
2005	February.2005	Feb	2498.12595	1	67.3	12.084
2006	February.2006	Feb	5425.4515	1	106.172	10.122929
2007	February.2007	Feb	4114.29925	1	88.64	9.645407
2008	February.2008	Feb	4189.57565	1	181.616	11.624276
2009	February.2009	Feb	4295.85615	0.96551724	100.342	10.414036
2010	February.2010	Feb	9621.9926	1	89.656	7.104964
2011	February.2011	Feb	3112.97395	1	126.748	11.732
2003	March.2003	Mar	3922.6613	1	200.668	16.658065
2004	March.2004	Mar	4096.04867	1	23.63	16.144194
2005	March.2005	Mar	3564.24977	1	252.968	13.656839
2006	March.2006	Mar	4820.26703	1	3.048	15.040968
2007	March.2007	Mar	4762.9999	1	38.608	16.212613
2008	March.2008	Mar	6108.0012	1	73.91	14.271
2009	March.2009	Mar	4939.743	1	298.454	15.076645
2010	March.2010	Mar	9621.9926	1	80.522	12.527767
2011	March.2011	Mar	4380.24395	1	121.162	16.206452
2003	April.2003	Apr	4334.47305	1	151.646	18.809333
2004	April.2004	Apr	2498.05	1	96.266	17.563
2005	April.2005	Apr	7917.1737	1	223.51	16.986333
2006	April.2006	Apr	2159.83275	1	49.278	20.765333
2007	April.2007	Apr	3556.65495	1	65.274	17.340333
2008	April.2008	Apr	5553.1032	1	55.882	18.620667
2009	April.2009	Apr	9621.9926	1	182.342	18.501667

2010	April.2010	Apr	8193.0976	1	99.808	19.166333
2011	April.2011	Apr	4401.2867	1	50.546	20.217
2003	May.2003	May	3800.55033	1	65.02	23.525484
2004	May.2004	May	1688.4771	1	16.762	23.415484
2005	May.2005	May	7498.7153	1	78.49	21.59129
2006	May.2006	May	900.54015	1	166.116	22.676774
2007	May.2007	May	1001.55295	1	0.254	22.947742
2008	May.2008	May	2711.1934	1	19.556	23.538065
2009	May.2009	May	9621.9926	1	86.364	22.977742
2010	May.2010	May	8516.81755	1	84.836	24.15871
2011	May.2011	May	1988.8339	0.64516129	17.268	22.989355
2003	June.2003	Jun	3924.5955	1	149.868	25.352759
2004	June.2004	Jun	900.54015	1	154.178	25.033
2005	June.2005	Jun	7271.95125	1	180.84	25.233667
2006	June.2006	Jun	37.2242	1	112.794	25.781333
2007	June.2007	Jun	0	0	50.802	26.216667
2008	June.2008	Jun	196.40775	0.25	64.512	26.645667
2009	June.2009	Jun	9298.90265	1	94.742	27.399667
2010	June.2010	Jun	5889.6982	1	151.876	27.396333
2011	June.2011	Jun	0	0	87.628	27.771667
2003	July.2003	Jul	5182.90135	1	178.04	25.343226
2004	July.2004	Jul	964.19735	1	92.958	26.305806
2005	July.2005	Jul	8424.84515	1	219.966	26.722258
2006	July.2006	Jul	0	0	55.12	26.903226
2007	July.2007	Jul	0	0	43.182	27.077742
2008	July.2008	Jul	0	0	98.048	26.470968
2009	July.2009	Jul	6940.20567	1	128.782	25.813871
2010	July.2010	Jul	2548.6992	1	44.456	28.265484
2011	July.2011	Jul	0	0	127.766	27.251935
2003	August.2003	Aug	6808.0542	0.98387097	184.148	25.499677
2004	August.2004	Aug	0	0	105.158	25.691613

2005	August.2005	Aug	8577.6484	1	175.266	26.243226
2006	August.2006	Aug	25.12353	0	165.364	26.96
2007	August.2007	Aug	465.92695	0	226.544	28.08871
2008	August.2008	Aug	2739.7295	0.0483871	406.136	25.960968
2009	August.2009	Aug	3927.33545	1	179.336	25.587419
2010	August.2010	Aug	763.15655	1	134.104	27.804333
2011	August.2011	Aug	0	0	55.37	27.839677
2002	October.2002	Oct	2219.7407	1	110.252	21.276452
2003	October.2003	Oct	4763.45255	1	78.226	18.937419
2004	October.2004	Oct	672.8567	1	48.266	20.592258
2005	October.2005	Oct	3372.9528	1	27.436	18.660323
2006	October.2006	Oct	0	0	91.19	18.111935
2007	October.2007	Oct	18.6121	0	100.586	20.7
2008	October.2008	Oct	962.50075	1	112.256	17.866774
2009	October.2009	Oct	2498.05	1	110.49	20.128387
2010	October.2010	Oct	0	0	6.096	19.319032
2003	November.2002	Nov	2910.84035	1	166.622	12.4622
2004	November.2003	Nov	3690.5862	1	49.54	15.4166
2005	November.2004	Nov	498.2704	0.15	118.62	15.253
2006	November.2005	Nov	913.949	1	75.43	14.928
2007	November.2006	Nov	258.0282	1	104.424	12.964667
2008	November.2007	Nov	0	0	45.464	13.3922
2009	November.2008	Nov	1191.27765	1	72.636	12.304367
2010	November.2009	Nov	1562.69675	1	55.37	13.299967
2011	November.2010	Nov	0	0	122.18	13.885333
2003	December.2002	Dec	2616.28955	1	127.764	8.912484
2004	December.2003	Dec	3645.47635	1	50.538	7.687839
2005	December.2004	Dec	2418.84365	1	90.676	8.934194
2006	December.2005	Dec	1750.54	1	142.244	8.644097
2007	December.2006	Dec	71.6145	0.27419355	113.03	12.00729
2008	December.2007	Dec	46.4735	0.24193548	149.35	12.831871

2009	December.2008	Dec	3186.6449	1	141.948	12.640097
2010	December.2009	Dec	4434.11173	1	220.224	9.93229
2011	December.2010	Dec	0	0	16.514	6.001387
2002	September.2003	Sept	5980.24567	1	54.866	23.017
2003	September.2004	Sept	454.43023	0.03333333	186.47	23.933
2004	September.2005	Sept	4663.77255	1	0.508	24.989333
2005	September.2006	Sept	0	0	121.16	23.202667
2006	September.2007	Sept	0	0	24.388	24.684
2007	September.2008	Sept	3262.10415	1	1.27	24.328667
2008	September.2009	Sept	2910.84035	1	103.12	24.679
2009	September.2010	Sept	0	0	34.796	25.654667
2010	September.2011	Sept	0	0	76.204	23.439333

Table S3. Life history traits of our focal species used in the fourth-corner analysis. Breeding season trait is represented by First Collected (# of days from Jan. 1st), development is represented by Average Developmental Period (days), and length in mm. Length data from Knapp (2019), except for AMTAL, AMTIG and ANTER, which were taken from the Jones Center W51 drift fence database. Breeding is from Knapp (2019) and Development is from Knapp (2019) except AMTAL, AMTIG, and ANTER. AMTAL Development taken from Walls and Altig (1986) and Smith (1961) in Virginia. AMTIG and ANTER Development average taken from the W51 database 2003-2008.

Species	Breeding	Development	Length
ACGRY	121	57.25	35.54
AMTAL	148	33	66.76
AMTIG	123	138.3	135.42
ANTER	124	63	11.63
GACAR	154	47.5	47.5
HYCIN	182	47	44.4
HYGRA	119	78.75	62.17
HYSQU	163	46.5	25.2
LICAT	119	585	69.13
LISPH	50	104.25	65.15
PSNIG	50	49	28.85
PSORN	50	97.5	46.88
SCHOL	72	39	30.4

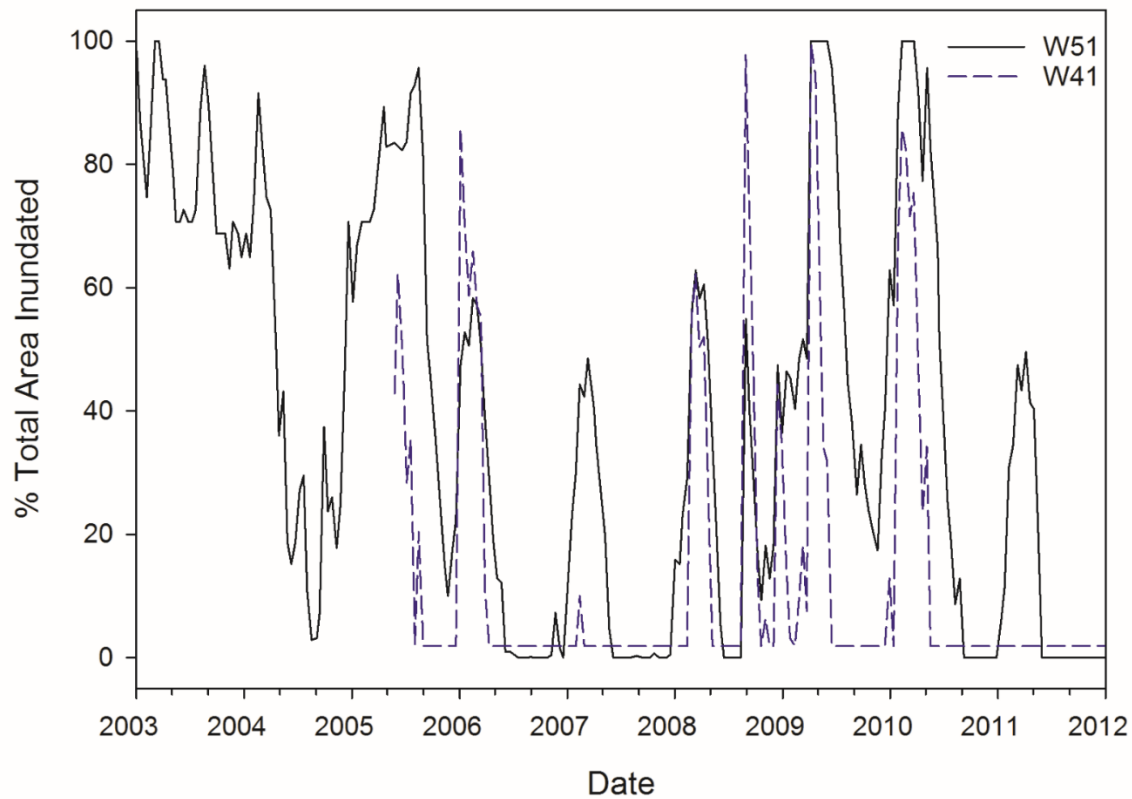
Table S4. Species richness and Shannon diversity across each sampling year in the two study wetlands.

Wetland	Water Year	Species Richness	Shannon Diversity
41	2006	7	1.05
	2007	5	1.15
	2008	4	0.0004
51	2003	10	1.82
	2004	12	0.47
	2005	12	0.74
	2006	13	2.15
	2007	11	1.22
	2008	9	0.61
	2009	10	0.42
	2010	4	0.80
	2011	7	0.29

Table S5. Total counts, biomass (dry mass; DM), C, N, and P exported by amphibians by year in W41 and W51.

Wetland	Water Year	Total Counts	DM (g)	C (g)	N (g)	P (g)
41	2006	300	52.36	25.13	5.11	0.72
	2007	84	63.60	31.74	6.11	0.78
	2008	310422	26108.81	11519.10	2442.83	445.38
	Averages	103602	8741.59	3858.66	818.02	148.96
	StDev	179111.41	15040.46	6634.14	1407.13	256.71
51	2003	1192	943.85	436.07	108.97	15.57
	2004	30486	2556.08	1077.66	255.23	41.50
	2005	12473	2330.79	1032.92	266.01	38.70
	2006	1719	584.23	272.59	65.69	9.44
	2007	991	257.028	119.73	29.11	3.69
	2008	6376	1367.81	642.28	153.19	17.19
	2009	13757	635.43	274.94	68.21	10.90
	2010	96	4.29	1.913	0.42	0.06
	2011	2338	515.93	242.75	57.58	6.38
	Averages	7714.22	1021.72	455.65	111.60	15.94
	StDev	9938.13	895.14	384.96	95.05	14.72

Figure S1. Percent of the total area of W41 and W51 that were inundated during the study. Amphibian sampling occurred from October 2002 to November 2011 (Water Years: 2003-2011) at W51 and from November 2005 to June 2008 (Water Years 2006 to 2008) at W41.



References

Luhning, T. M, DeLong, J. P., and R. D. Semlitsch. (2017). Stoichiometry and life-history interact to determine the magnitude of cross-ecosystem element and biomass fluxes. *Frontiers in Microbiology* 8.

Smith, P.W. 1961. The amphibians and reptiles of Illinois. *Bulletin of the Illinois Natural History Survey* 28:1-298.

Walls, Susan C., and Ronald Altig. "Female reproductive biology and larval life history of *Ambystoma* salamanders: a comparison of egg size, hatchling size, and larval growth." *Herpetologica* (1986): 334-345.