

Supplemental Materials

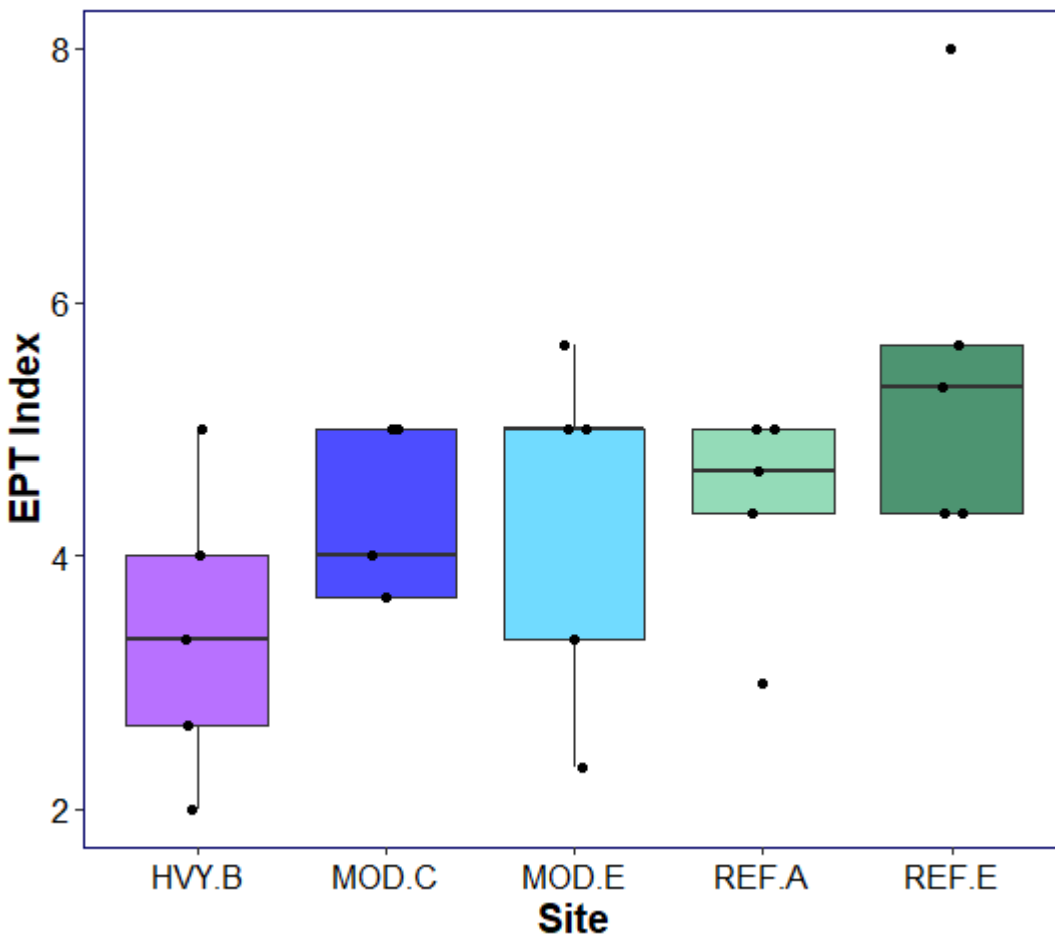
Supplemental Table 1. Mean (\pm SE) basal area ($\text{m}^2 \text{ha}^{-1}$) and density (stems ha^{-1}) and of total, live, and dead Amur honeysuckle (*L. maackii*) in five headwater stream riparian forests in southwestern Ohio experiencing differing levels of invasion by the exotic shrub *Lonicera maackii*. For this study, five 1st and 2nd order streams in Southwestern Ohio, USA were selected based on their variation in *Lonicera maackii* invasion density. We selected two streams with minimal *L. maackii* invasion to serve as reference sites: Englewood Reference (REF.E) located in Five Rivers Metroparks, Englewood, Ohio, USA, and Aullwood Reference (REF.A) located in Aullwood Audubon Center, Dayton, Ohio, USA. Two moderately invaded sites were 1st order headwater streams: Englewood Moderate (MOD.E) located in Five Rivers MetroParks, Englewood, Ohio, USA, and Charleston Falls Moderate (MOD.C) located in Miami County Park District, Tipp City, Ohio, USA. A heavily invaded site was Buckeye Trail Heavy (HVY.B) located in Five Rivers MetroParks, Vandalia, Ohio, USA.

Site	Total	Live	Dead
<i>Lonicera maackii</i> Basal Area			
HVY.B	7.09 ± 1.44	3.80 ± 1.11	3.29 ± 1.45
MOD.C	4.50 ± 0.58	2.38 ± 0.72	2.12 ± 1.00
MOD.E	5.48 ± 0.66	3.08 ± 0.93	2.40 ± 1.07
REF.A	0.01 ± 0.01	0.01 ± 0.01	0.00 ± 0.00
REF.E	0.16 ± 0.14	0.01 ± 0.01	0.15 ± 0.14
<i>Lonicera maackii</i> Density			
HVY.B	10648.15 ± 1964.08	5833.33 ± 1491.14	4814.81 ± 914.75
MOD.C	6666.67 ± 804.28	3634.26 ± 1104.97	3032.41 ± 1023.40
MOD.E	5787.04 ± 793.55	2893.52 ± 801.41	2893.52 ± 980.40
REF.A	23.15 ± 23.15	23.15 ± 23.15	0.00 ± 0.00
REF.E	231.48 ± 137.34	23.15 ± 23.15	208.33 ± 142.32

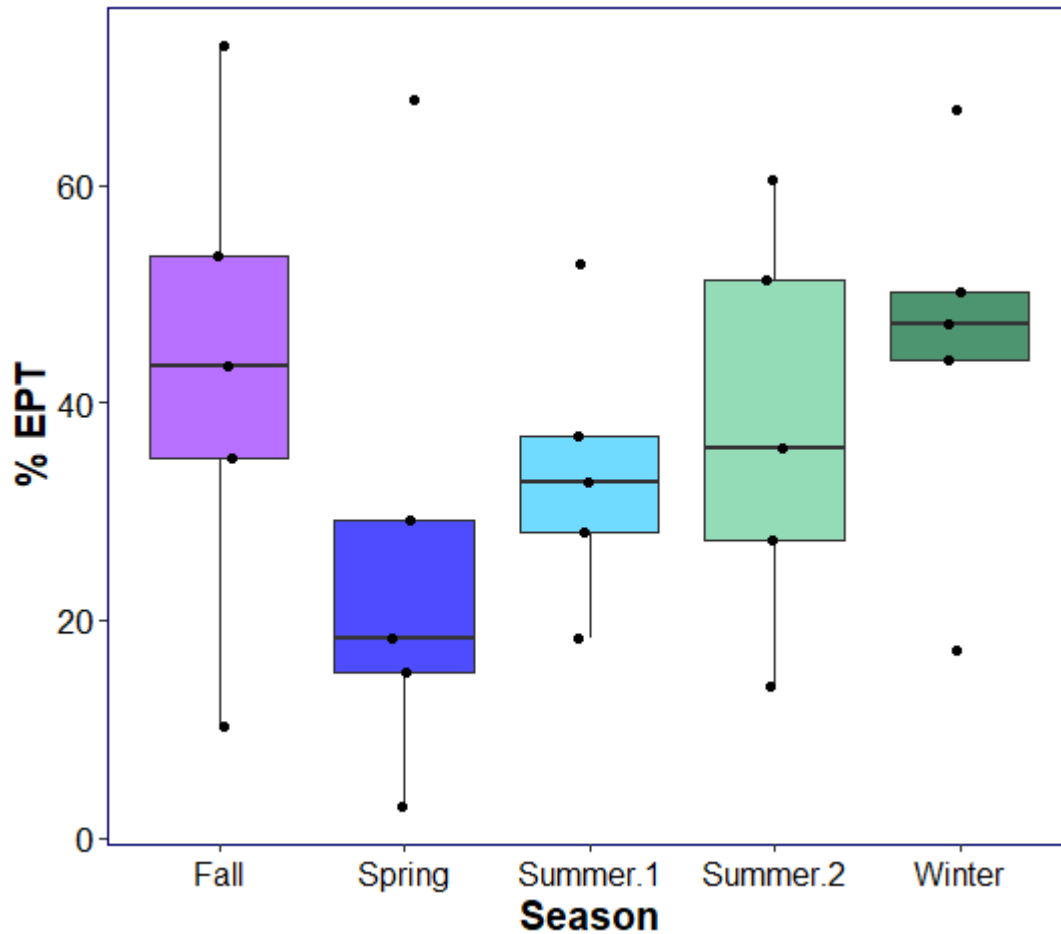
Supplemental Table 2: Site characterization for five headwater streams in southwestern Ohio used to assess the influence of *Lonicera maackii* on stream biology. The Headwater Habitat Evaluation Index (HHEI; Ohio EPA 2018) was performed at all sites in 2015. In addition, all sites were characterized for physical (instream habitat, watershed area, and % forest cover), bank full width, wetted width, and maximum pool depth was measured within each experimental stream reach (30 m). All sediments were measured for sediment % solids and sediment % TOC (Heiri et al. 2001; Santisteban et al. 2004). Sediments were dried at 105 °C for 24 ± 2 h, and TOC was calculated based on loss on ignition (LOI; (550 °C at 4 ± 0.5 h) using a correction factor of 0.38 to convert LOI to organic carbon (Redfield 1934). Watershed area and % forest cover was calculated using USGS Stream Stats 4.0 program (<http://streamstatsags.cr.usgs.gov/streamstats>).

	REF.A	REF.E	MOD.E	MOD.C	HVY.B
Stream Order	2nd	2nd	1st	1st	1st
HHEI	79	83	79	78	74
Watershed* (mile ²)	0.32	0.22	0.04	0.07	0.1
Sediment % Solids	81.7 ± 2.0	84.7 ± 1.3	81.3 ± 1.0	80.5 ± 1.8	81.6 ± 0.9
Sediment % TOC	0.6 ± 0.3	1.8 ± 0.08	1.7 ± 0.5	1.1 ± 0.2	0.8 ± 0.04
Bankfull Width (m)	3.6 ± 0.2	5.0 ± 0.3	3.7 ± 0.7	4.0 ± 0.5	2.6 ± 0.8
Wetted Width (m)	2.7 ± 0.6	1.8 ± 1.2	1.6 ± 1.0	1.8 ± 0.7	2.6 ± 0.8
Maximum Pool Depth (cm)	20.5	11	12	18.5	12

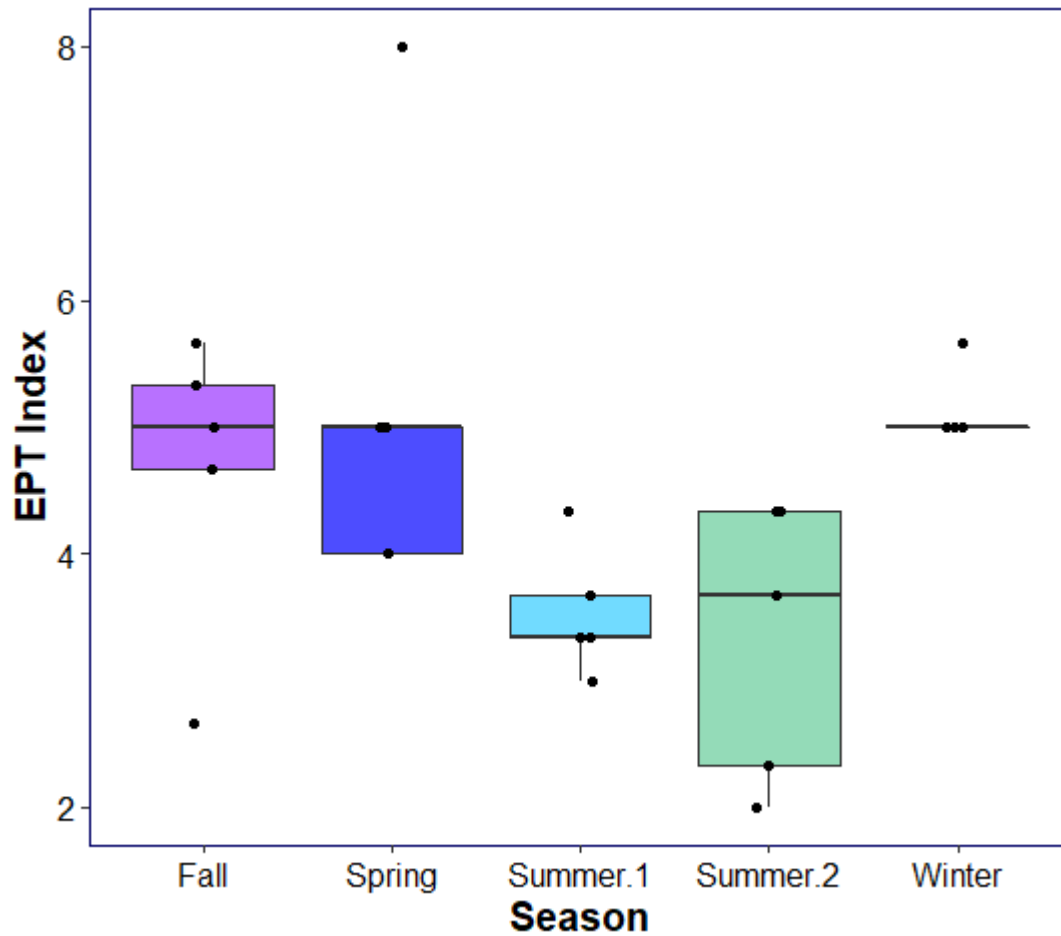
Supplemental Figure 1: EPT Index in streams characterized by a gradient of riparian *L. maackii* density in temperate forests in southwest Ohio. An EPT Index is the sum of all distinct families identified within the orders Ephemeroptera, Plecoptera, and Trichoptera. This metric was calculated using either treatment or season as a random effect to look at *L. maackii* effects and seasonal effects separately. Center line of the boxplots are the median and each dot represents the mean values from one of the five seasonal samples within a particular site.



Supplemental Figure 2: Percentage of EPT individuals (%EPT) by seasonal sampling. This metric is calculated by summing all individuals in the orders Ephemeroptera, Plecoptera, and Trichoptera and dividing by the total number of macroinvertebrates in the sample. This metric was calculated using either treatment of season as a random effect to look at *L. maackii* effects and seasonal effects separately. Center line of the boxplots are the median and each dot represents the mean values from one of the five sites within a particular season.



Supplemental Figure 3: EPT Index by seasonal sampling. An EPT Index is the sum of all distinct families identified within the orders Ephemeroptera, Plecoptera, and Trichoptera. This metric was calculated using either treatment or season as a random effect to look at *L. maackii* effects and seasonal effects separately. Center line of the boxplots are the median and each dot represents the mean values from one of the five sites within a particular season.



Supplemental Figure 4: Percentage of Chironomidae individuals by seasonal sampling. This metric is calculated by summing all individuals in the family Chironomidae and dividing by the total number of macroinvertebrates in the sample. This metric was calculated using either treatment of season as a random effect to look at *L. maackii* effects and seasonal effects separately. Center line of the boxplots are the median and each dot represents the mean values from one of the five sites within a particular season.

