Herbaceous layer species richness along forested headwater streams is negatively impacted by Amur honeysuckle (Lonicera maackii) invasion

Follow this and additional works at: https://ecommons.udayton.edu/stander_posters

Recommended Citation
"Herbaceous layer species richness along forested headwater streams is negatively impacted by Amur honeysuckle (Lonicera maackii) invasion" (2017). Stander Symposium Posters. 984. https://ecommons.udayton.edu/stander_posters/984

This Book is brought to you for free and open access by the Stander Symposium at eCommons. It has been accepted for inclusion in Stander Symposium Posters by an authorized administrator of eCommons. For more information, please contact frice1@udayton.edu, mschlangen1@udayton.edu.
Herbaceous Layer Species Richness along Forested Headwater Streams is Negatively Impacted by Amur Honeysuckle (Lonicera maackii) Invasion

Mitchell J. Kukla, Meg E. Maloney, Julia L. Chapman, Erin C. Rowekamp, and Ryan W. McEwan
Department of Biology, University of Dayton, Dayton OH

Objective and Hypotheses

Objective: Overall, we aim to understand how native herbaceous species richness and abundance are impacted across a gradient of Lonicera maackii (Amur honeysuckle) invasion along headwater streams in Southwest Ohio.

H1: Species richness will decrease as L. maackii invasion increases.
H2: Herbaceous cover will decrease as L. maackii invasion increases.
H3: There will be differences in community composition across the L. maackii invasion gradient.

Methods

- Study Sites: 5 sites along headwater streams and varying populations of L. maackii: 2 Reference (low to none), 2 Moderate (medium), and 1 Heavy (highly invaded).
- Data Collection: 12 1m² plots were established at each site. Plots were sampled in April, June, and August of 2016. All herbaceous species were identified and cover for each species was estimated as percentage of the plot area.
- Data Analysis: For each species in each sampling date, species richness and total cover were calculated for each plot. ANOVA was used to test for differences among sites.

A floristic assessment index was used to evaluate species richness among sites.

Results

Figure 1. Species richness for each site in April (left), June (center), and August (right). Sites are arranged from left to right in order of increasing L. maackii invasion. Blue boxes are reference sites, yellow are moderately invaded, and red is heavily invaded.

Figure 2. Herbaceous cover (cm²) for each site in April (left), June (center), and August (right). Sites are arranged from left to right in order of increasing L. maackii invasion. Blue boxes are reference sites, yellow are moderately invaded, and red is heavily invaded.

ANOVA Results

- In April, the Englewood Reference site had significantly higher species richness than the Aullwood Reference (F = 0.000089) and Englewood Moderate (F = 0.024) sites (Fig. 1).
- In June, the Englewood Reference site had significantly higher species richness than the Aullwood Reference (F = 0.0016) and Charleston Falls Moderate (F = 0.043) and Buckeye Trail Heavy (F = 0.00038) sites.
- In August, the Englewood Reference site had significantly higher species richness than the Aullwood Reference (F = 0.00196) and Buckeye Trail Heavy (F = 0.000087) sites.

- There were no significant differences in vegetation cover (%) across the gradient of honeysuckle invasion (χ² = 0.05; Fig. 2).

FQAIR results

- The Heavy site had more non-native species present in April and June than the other sites (Fig. 3).
- Englewood Reference had many non-native species with COC scores >3 (Fig. 3).
- The Englewood Reference site and both Moderate sites were dominated by native cover (Fig. 4).
- The Heavy site was dominated by non-native plant cover in April (69.5%), but by increasingly native cover in June and August (Fig. 4).

Conclusions

- Lonicera maackii appears to have a negative impact on herbaceous species richness, which is likely the result of decreased light availability, competition for resources, and/or allelopathy.
- We believe that the difference in species richness between the two reference sites at Englewood and Aullwood were likely due environmental variation and a greater intensity of deer herbivory at Aullwood.
- While total herbaceous species cover did not differ significantly across the gradient of honeysuckle invasion, we found that the heavily invaded site (Buckeye Trail) had a higher proportion of non-native cover than the other sites during the first part of the growing season.
- Sites with lower L. maackii invasion tend to have species with greater sensitivity to disturbance (high COC scores). This suggests that honeysuckle is influencing the composition of the herbaceous plant community.
- Further analyses are needed to continue examining the differences in community composition among the sites. We will use Nonmetric Multidimensional Scaling (NMDS) next to better understand these differences.

Acknowledgements

Support for this project was provided by the University of Dayton, Aullwood Audubon Center, Miami County Park District, and Five Rivers MetroParks. Funded by NSF award DEB 1352995.
We would like to thank Sean Mahoney, Eric Borth, Darby Grand-Pierre, and Keith Gilland for their assistance in the field.