

Kudzu (*Pueraria montana*) site availability in the Great Lakes Region

Ashley Kovach-Hammons, Purdue University Fort Wayne; **Jordan M. Marshall**, Purdue University Fort Wayne (Email: marshallj@pfw.edu)

Kudzu in the Great Lakes basin: Kudzu (*Pueraria montana*) is an invasive vine native to eastern Asia that is widespread in the southeastern United States, with a distribution in the US that continues to expand. Kudzu can grow up to 30 cm per day, allowing it to outcompete and kill native vegetation through shading.¹ The expansion of kudzu north has resulted in at least 25 reported sites in the US portion of the Great Lakes basin alone.^{2,3}

Objectives and Approach: This project aims to compare modelling approaches to predict site availability for kudzu invasion within the Great Lakes basin and to refine these models so they may be useful in land management decision-making. Probability models were developed from existing spatial data (land cover, hydrology, geology, climate, and known kudzu locations³) using generalized additive, bioclimate envelope, and maximum entropy methods (Figure 1). Eight known kudzu sites (presence sites) across Indiana, Michigan, and Ohio were surveyed for ecosystem characteristics including canopy cover, soil moisture, soil pH, litter depth, and midstory diversity. These were paired with 8 control sites that have not had kudzu presence (absence sites) for a total of 16 survey sites (Figure 2).

Results: Urban and disturbed areas resulted in the greatest probability of potential habitat for kudzu and represent areas most susceptible to invasion within the Great Lakes basin (Figure 1).

- The kudzu presence and absence sites were not significantly different with respect to the environmental characteristics. Similarly, there was no significant difference between sites inside or outside of the basin.
- Our predictive models did not accurately predict kudzu presence at our known kudzu and control (absence) locations within the Great Lakes basin.

As no significant differences in environmental characteristics were found between the kudzu and control sites' samples, our data suggest kudzu may be dispersal-limited rather than limited by environmental characteristics. Additionally, since site characteristics inside and outside the basin were not different, known location sites outside the basin will be added to improve model predictions.

FOR FURTHER READING:

¹Lindgren et al. (2013). *Canadian Journal of Plant Science* 93: 71-95.

²Callen & Miller et al. (2015). *Diversity and Distributions* 21: 853-863.

³EDDMapS <http://www.eddmaps.org/>

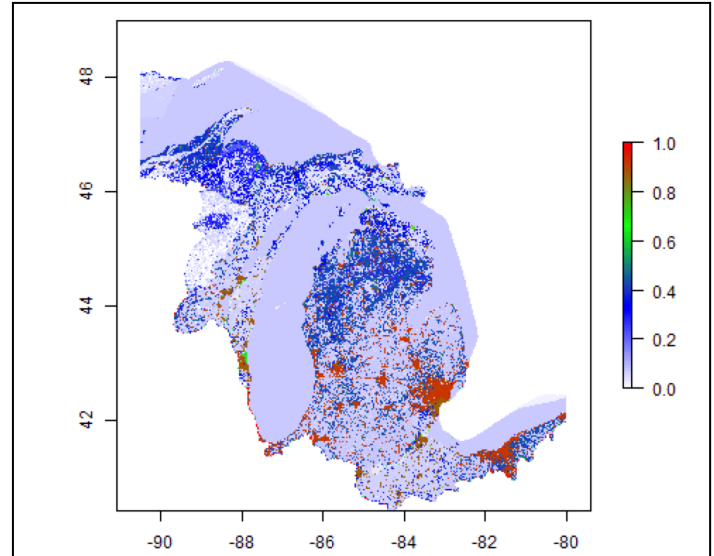


Figure 1. Maximum entropy (MaxEnt) model predicting probability of kudzu habitat availability within the US portion of the Great Lakes basin. Red sites indicate highest probability.

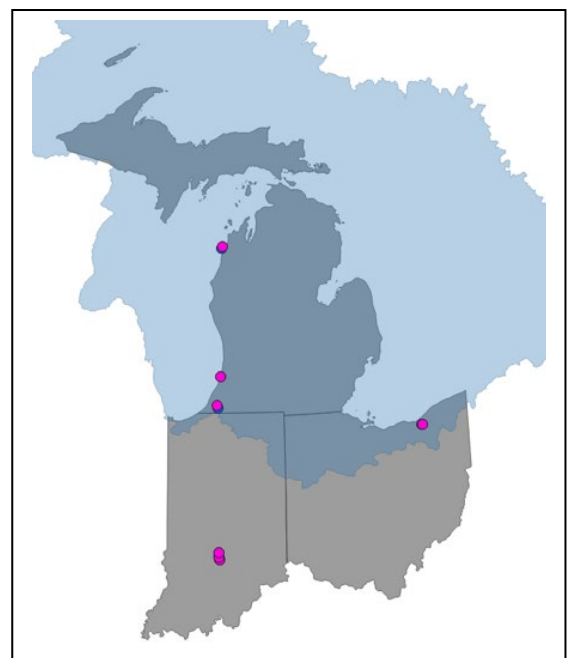


Figure 2. Map of surveyed kudzu sites (shown in pink) across Indiana, Michigan, and Ohio. The Great Lakes basin boundary is shown with blue overlay.