

## **Using maximum entropy modeling to predict suitable habitat locations for the Cutshin Crayfish (*Cambarus taylori*)**

ERIC TIDMORE, Department of Natural Sciences and Mathematics, West Liberty University, West Liberty, WV, 26074 and ZACHARY LOUGHMAN, Department of Natural Sciences and Mathematics, West Liberty University, West Liberty, WV, 26074

The Cutshin Crayfish (*Cambarus taylori*) is a recently described species which is endemic to the Middle Fork of the Kentucky River basin. The Middle Fork of the Kentucky River lies within the anthracite coal fields of Eastern Kentucky, and thus a conservation assessment of *C. taylori* is warranted. The goal of this study was to predict suitable habitat locations for *C. taylori* through use of maximum entropy modeling (MaxEnt). The Middle Fork of the Kentucky River's crayfish fauna was surveyed during the summer of 2014. The occurrence data from this study coupled with landscape scale environmental variables—such as stream order and land use data—was used to create the model. The mean area under the receiver operating characteristic curve (AUC) value was 0.898, showing the model had high predictive accuracy. The model indicated high probability of occurrence in streams at the southern end of the basin, and a low probability of occurrence at the northern end of the basin. Stream order and stream sinuosity had the highest contribution to the model showing that *C. taylori* prefers 3<sup>rd</sup> and 4<sup>th</sup> order streams with low sinuosity. Although the AUC value showed high predictive accuracy for the model, predicted sites will need to be ground validated to confirm the model's predictive accuracy.