

TAYLOR WHITSON, CAITLIN. DE VRIES, ZACKARY GRAHAM, ZACHARY LOUGHMAN, Dept. of Organismal Biology Ecology and Zoo Science, West Liberty University, West Liberty, WV 26074. Creating a baseline for bioaccumulation in crayfish in the central Appalachian coalfields

Cambarus veteranus and *Cambarus callainus* are highly imperiled crayfish that are federally listed. These crayfish are native to the coalfields region of central Appalachia. The dominant industry and land use in this region is coal mining. The most common method of mining in this area, surface mining, employs large ponds to hold a slurry water byproduct created when cleaning the coal. Intermittently, the containment structures for these ponds fail causing the uncontrolled release of coal slurry. There is a lack of data on the rates of bioaccumulation of elements commonly associated with mining in crayfish within this region before and after these spills occur, such that there is no reference to know what concentrations constitutes “normal” rates. Chemical pollutants along with increased sedimentation from industrial sources are known to cause adverse effects in crustaceans and can be lethal. Therefore, it is crucial to better understand what baseline conditions of bioaccumulation are within this region before spills occur. This study assessed the bioaccumulation of magnesium (Mg), aluminum (Al), chromium (Cr), manganese (Mn), iron (Fe), nickel (Ni), zinc (Zn), arsenic (As), selenium (Se), cadmium (Cd), and lead (Pb) in non-imperiled crayfish by analyzing hepatopancreas and gill tissues. We analyzed rates of bioaccumulation grouped by crayfish genus and tissue type throughout each season. Differences between genus and tissue type, reference and degraded sites, and between crayfish tissue type, periphyton, and water were also investigated. Seasonal variation in the concentrations of elements in crayfish tissue was found with higher element concentrations during winter and lower concentrations during summer. Differences between crayfish tissue type, periphyton, and water were also found, with periphyton typically having the highest concentrations, water having the lowest concentrations, and crayfish tissue being between concentrations found in water and periphyton.

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