PREDICTING THE CONSUMPTION RATES OF *STENONEMA (HEPTAGENIID)* MAYFLY LARVAE IN THE PRESENCE OF DIFFERENT AQUATIC PREDATOR COMBINATIONS AND DENSITIES

**Authors:** Nicholas R. Ozburn, Heather D. Vance-Chalcraft, and Daniel A. Soluk

**Department:** Animal Biology & NRES, UIUC; Center for Aquatic Ecology, Illinois Natural History Survey

**Abstract:** Many studies have been conducted in the field of ecology focusing on the impacts of a single predator species on a single prey species. However, in most natural communities several predator species can be acting on a prey species simultaneously. Some ecologists believe that we can predict the impact of multiple predator species on a single prey species by combining the impacts of each individual predator species using a multiplicative risk model. This model assumes that a predator would not consume prey differently in the presence of another predator. To determine whether this model yields accurate prediction under field conditions, we conducted a predator enclosure field experiment in Jordan Creek (Vermilion County). We measured the number of *Stenonema* (heptageniid) mayfly larvae that were consumed in the presence of different combinations and densities (0, 1, or 2) of the two predator species (*Corydalus cornutus* and *Boyeria vinosa* dragonfly larvae).

In this study we found that the predators were influenced by the presence of other predators. In two of the three multiple predator combinations *Stenonema* were consumed in a significantly different proportion than the model had predicted, indicating that the predators were influenced by the presence of other predators. Our research indicates that the impacts of multiple predator species on a single prey species can be difficult to predict using knowledge of the individual effects of each predator species, because predators can affect each other as well as the prey they feed upon.