

## Sampling protocols and notes for BLMA Insect Surveys

### CARABID BEETLES

#### Sampling via pitfall traps

12 oz. cups sunk flush with soil, covered with a 6" tile on a wooden prop 1" tall.

Trap fluid was 2 oz. of 50% propylene glycol (non-toxic preservative), plus dash of detergent (to break surface tension).

Eight transects of five traps each. Within each transect, traps placed 20 m apart in straight line extending from road or other edge to interior.

Traps placed May 10-11<sup>th</sup>, 2012, emptied of specimens every two weeks. Traps removed October 2012.

Beetles identified by Rachel MaKarrall using Lindroth and other keys as necessary. Identification incomplete for some beetles- is ongoing.

Pie graphs show proportion of total individuals in each transect made up of two exotic European species (*Pterostichus melanarius*- red; *Carabus nemoralis*- blue) and remaining native species (green).

Some evidence to indicate these exotics are displacing native species in other areas. This is (as far as I know) the first time any carabids have been sampled at BLMA, so we are unclear of the historic picture for comparison.

Analyses yet to be done with current data set:

Complete identifications.

Comparisons of species composition and community similarity between cover types, and along a gradient from edge to interior of each cover type.

Analysis of phenology of various species (and sexes) throughout.

Analysis of *P. melanarius* wing morphs, which can help establish direction and speed of active invasions.

Correlations between species present and habitat characteristics immediately surrounding each trap, including groundcover, leaf litter, tree species and DBHs, and percent shade.

Comparison with similar habitats in other sites, including samples from Minnesota Point, Bagley Nature Area, UMD Sustainable Agriculture Project Farm, and Lake Vermilion State Park.

Further trap sampling in other habitats within BLMA.

## **Sampling protocols and notes for BLMA Insect Surveys, contd.**

### **ODONATA**

Sampled regularly at locations indicated on map, from April through October 2012. Most locations were visited every other week by two individuals with aerial nets. Identifications in the field where possible. Maximum of five specimens taken per species, with preference given to mature males.

#### **Further sampling:**

Collect exuviae to establish breeding sites of Odonata within BLMA (some sampling begun July 2014 near boat landing.)

### **BUTTERFLIES and SKIPPERS**

Sampled regularly at locations indicated on map, from April through October 2012. Most locations were visited every other week by two individuals with aerial nets. Identifications in the field where possible. Maximum of three specimens taken per species.

### **MOTHS**

UV lights (BugNapper) were hung at two locations at 8:00 p.m. June 30, 2012: one at the warming house, and one on the lakeshore near the ELC. A white sheet was hung on a clothesline with the light in the middle, visible from both sides of the sheet. Moths were collected at each light every two hours until 6:00 a.m. July 1. Effort was made to collect at least one of each species present at each sampling. Moths identified by Kyle Cross.

#### **Further analyses to be done with current data set:**

Track moth times at light to reveal each species' nighttime activity patterns.

#### **Further sampling:**

UV light trapping at other times throughout the summer.

UV light trapping at other areas within BLMA.