

The Incorporation of Insects into the Allen Creek Conservation Plan

Abstract

Dr. Kerry Katovich: In July 2007, Katovich, professor of biology at UW-Whitewater, led a group of FACW members in a BioBlitz event to collect insects at terrestrial and aquatic sites on a single day. Subsequent sampling was completed by Katovich and his students. Katovich analyzes and interprets the data to identify insect species and species diversity in the watershed. Katovich makes note of species of particular interest and makes recommendations for further studies as well as outlining general land management activities that promote and protect insect species diversity.

Insects are the largest and most diverse component of any ecosystem, yet they are rarely considered in management issues. The habitat requirements for insects can be challenging to define, yet are often very simple, for example, patches of open sand, a particular plant type, the presence of dead timber. These esoteric small factors are often difficult to take into consideration for those that manage land. Additional complexities for management plans involving insects include complex lifecycles, often utilizing very different habitats, little to no knowledge of most invertebrate species' natural histories, lack of an understanding of distribution information, difficulty in surveying, and most importantly of all, an almost complete lack of taxonomic expertise to adequately name the majority of insect species.

Currently, my students' and my personal contributions to Allen Creek are outlined in the following report.

To address the primary insect focus of the conservation plan for Allen Creek the following tasks must be accomplished:

- Base-line surveys of what insects are present at Allen Creek.
- An understanding of habitat requirements and needs for individual species.
- An understanding of the implications for management practices on individual insects.

In the summer of 2007 plans were made to incorporate insects into the ongoing management plans for Allen Creek. To initiate this, a mini Bioblitz was conducted to provide members and interested parties an idea of the diversity of organisms and possibly an idea of the challenges posed by these organisms. In the spring of 2008 a series of insect surveys was initiated to begin the base-line survey, which forms a necessary start to addressing the aforementioned tasks.

For all ongoing faunal surveys the following details apply.

No other taxonomically or geographically comprehensive survey has ever been conducted in Wisconsin for the initial taxa discussed, therefore not much is known about these insect groups, whether it is about feeding behavior, reproduction, or habitat preferences. Documentation on species presence and species location/habitat will benefit the Allen Creek project along with groups such as U.S. Fish and Wildlife, Forest Services, Department of Natural Resources and Bureau of Endangered Resources.

Details applied to all ongoing surveys at Allen Creek:

1.) Undergo a statewide collection to compile a list of particular species present in Wisconsin (including the Allen Creek watershed).

During a time period beginning late spring through mid fall, we will visit different locations and microhabitats within the Allen Creek watershed to get a better understanding of what and how many species are present.

To capture specific insects we will be using a wide variety of collection techniques, including black lights, pitfall traps (baited and unbaited), flight intercept and malaise traps, hand collection, etc. Insects are curated and all relevant information is recorded. All identified species will be databased using the biodiversity database BIOTA, which will eventually be linked to the UW-Madison state insect collection (IRC), as well as the Friends of Allen Creek website. This relational database provides a documentation of insects present at the site, and natural history information, which can be

utilized for management decisions. A voucher collection of Allen Creek insects will be deposited in the Katovich-Kriskas insect collection housed at the UW-Whitewater Biology Department. Any new state records will be deposited in the IRC of the UW-Madison.

II.) Determine if certain species are localized to specific habitats.

Based on the locations recorded we will be able to determine if certain species prefer specific habitats. One example, *Promachus vertebratus* (Say), a large robber fly species, appears to be found exclusively in short grass sand prairies (a short grass sand prairie exists along a portion of Allen Creek).

Specific plans to incorporate invertebrates into the current and future plans for Allen Creek watershed:

- An ongoing faunal survey of insects initiated in 2007. Utilizing the exceptional quality of the habitats located along Allen Creek, its proximity to the University of Wisconsin-Whitewater, and the availability of enthusiastic biology students, a long-term study has begun. The overwhelming numbers and diversity of insects prohibits rapid identification, or even curation of substantial portions of survey materials. All specimens are preserved and will eventually be curated and distributed to, if possible, those with taxonomic expertise to obtain identifications. In 2008 several focus groups of insects have been targeted to match student research areas and the expertise of Dr. Kerry Katovich (UWW entomologist).

- The following are target groups:
 - o Asilidae (Diptera) are commonly known as robber flies. Allen Creek provides a rich habitat to investigate in more detail the particular habitats and behaviors of these predatory insects.
 - o Alydidae (Hemiptera) are commonly known as big-headed bugs. Allen Creek provides a rich habitat to investigate in more detail the particular habitats and behaviors of these predatory and seed feeding insects.

- Berythidae (Hemiptera) are commonly known as stilt-legged bugs. Allen Creek provides a rich habitat to investigate in more detail the particular habitats and behaviors of these small plant feeding insects.
 - Coreidae (Hemiptera) are commonly known as leaf-footed bugs. Allen Creek provides a rich habitat to investigate in more detail the particular habitats and behaviors of these seed feeding insects.
 - Reduviidae (Hemiptera) are commonly known as assassin bugs. Allen Creek provides a rich habitat to investigate in more detail the particular habitats and behaviors of these predatory insects.
- Coleoptera survey, utilizing the existing expertise within the UW system, a vast portion of Coleoptera can be identified. Currently we are focusing on all Scarabaeoidea families, Anobidae, Cerambycidae, Cleridae, Heteroceridae, Melandryidae, Meloidae, Mordellidae, Nitidulidae, Tenebrionidae, all aquatic coleopteran families, to name but a few. Several large groups including Carabidae and Curculionidae will be tackled this year. Coleoptera of particular importance appear to be in the Mordellidae, as they are primarily stem dwellers with apparent high plant species specificity.
- Aquatic insects of Allen Creek are being documented in a current research project. Aquatic insects will be identified as far as possible (many aquatic Diptera are currently impossible to identify). Particular focus is given to those insects that can be utilized as indicators of water and habitat quality.

Possible future groups for investigation:

Expertise exists in Wisconsin for several important components of the Allen Creek insect fauna. These include the following: Lepidoptera (not exclusive), Odonata, Orthoptera, and numerous Hymenoptera (Apoidea, Mutilidae, several parasitic taxa). Non-insect taxa are also important for future identification, including the rich spider, centipede, millipede, and harvestmen fauna. In all cases we will continue to collect and

document these organisms in hope that eventual expertise can be utilized for identification.

Ongoing special projects

To address a specific target project, a survey for the presence of potential pollinators of the federally endangered Eastern Prairie Fringed orchid (*Platanthera leucophaea*) will be conducted in 2008. This wetland species currently exists in adjacent properties and it may be feasible to introduce new populations along Allen Creek.

This survey will begin in the last week of June and continue until the first week of July. During this period several individuals will be provided with UV-lights to attract potential Shingidae (Lepidoptera) pollinators. Each observer will be asked to live-capture all members of this family. They will then return any captures to Dr. Katovich in the field, who will identify the individual species and document the occurrence of any possible pollinator species (3 primary species are likely), photograph and release them. Observations will be from approximately sundown to midnight. The number of attempts is weather dependent.

Results to date:

Currently only a handful of collections have been performed (main effort of survey initiated in spring of 2008). We have begun to identify numerous insect groups, however our main focus is primarily on collection during the spring and summer months. It is currently too early in the survey efforts to provide any meaningful documentation of specific insect taxa.

Management considerations

The maintenance of a diversity of habitats is encouraged. Management practices such as burning must consider the scope and degree to which they are carried out. The understanding that numerous insects have poor dispersal abilities, or are specific stem

dwellers implies that any burning should be random, and suitable adjacent areas be set aside as source populations to re-colonize the burned regions. Specific microhabitats must be considered as well. Suspended dead timber, standing timber, and downed dead timber is a critical microhabitat for many invertebrates. The abundance, diversity of decay types, and distribution are critical to preserve.

Plant diversity is critical to maintain while providing possible resources such as food, living space, nectar source, etc. It is important to remember that many insects utilize different plants in their life history. It is also important to note that many insects utilize different habitats; therefore it is important to have an availability and transition between differing communities.

The aquatic habitat requirements for insects must ensure high quality water with low sediment loads. Streams management should ensure a diversity of riparian vegetation, providing both sunlight exposures to the river as well as shaded regions. Debris in the stream can also be a critical component of aquatic insect diversity.

The control of invasive plants is favorable, as well as a reduction in pesticide usage. It is also desirable to reduce the proximity of high intensity lights that can serve to draw in nocturnal species.

In summary, due to our poor understanding of the Allen Creek insect fauna and our poor understanding of their particular habitat requirements, only the broadest management considerations can be proposed at this point.