

## Arguably, the Most Important Animals on the Planet Are the Ones under Our Feet (or Buzzing through the Air); This Session Explains Why

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THIS SESSION AT THE 2015 GEORGE WRIGHT SOCIETY CONFERENCE dealt with insects regarding both their importance to the local ecosystems of parks, as well as the research being conducted about them by park staff. Six lecturers spoke during the two hour session, each approaching a different aspect of insect science. Topics included a wide range of studies from the broad to the specific, focusing on themes of species diversity, phenology, and citizen scientists.

**Eastern tent caterpillars.** Insects can give us insight into how ecosystems are adapting to conditions of global climate change. The eastern tent caterpillar and its host, the black cherry tree, are good specimens to use because they cover much of North America and have a lifecycle which is dependent on its own phenology matching up with that of its specific host plant. As temperatures warm, especially wintertime low temperatures, many species' annual cycles are thrown off their normal sequence. In this study it was found that oftentimes warmer temperatures would cause larvae to hatch early, before any tender leaves had grown for them to eat. This "phenology mismatch" is a theme that is being explored in modern biological science, and one which may have larger consequences than starving caterpillars.

**Mission blue butterfly.** The Mission blue butterfly is a local species of butterfly which has been dwindling both in area and in total population in recent years. They are dying out primarily due to habitat loss, as they depend on three species of lupine to reproduce. Today they are based in the Marin, Twin Peaks, and San Bruno areas of California, within ecological reserves or in state and national park land. Attempts to repopulate the butterfly population are centered around habitat restoration (i.e., lupine). Challenges with this include strong invasive species as well as a fungal pathogen which has been killing Lupine both in the wild and in the park plant nurseries.

**Native bee diversity.** Contrary to popular belief, not all bees are honeybees! In fact there are 4,000 species of bees in the United States alone, and 19,200 species worldwide. Bee diversity in the U.S. is greatest in the Southwest desert region, and many of these species have not been studied extensively enough to have even been named. Climate change and phenology shifts threaten bees and pollinators in general, by throwing off the seasonality of their host plants. Additionally

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**Citation:** Weber, Samantha, ed. 2016. *Engagement, Education, and Expectations—The Future of Parks and Protected Areas: Proceedings of the 2015 George Wright Society Conference on Parks, Protected Areas, and Cultural Sites*.

Hancock, Michigan: George Wright Society.

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heat agitates the bees, and distracts them from their routine of pollination. Bees must be captured in order to be studied and categorized. This is done, often by volunteers, by laying out colored bowls with soapy water in them which bees mistake for flowers, with different colors attracting different groups of bee species.

**Managing citizen scientists.** Volunteers can act as an enormous resource to parks conducting research, acting as “Citizen Scientists” who collect, catalog, and organize data for experts to analyze and categorize. Consistent volunteers perform the best, and recapturing volunteers is easy as long as you use certain strategies to make the experience enjoyable and productive. Organizing potlucks and providing basic training can lead to a devoted addition to any park’s workforce.

### Reflection

The George Wright Society Conference was my first experience in a professional networking context. I arrived at 9:30am on the day of my session and quickly checked in, got my nametag, and headed up to my lecture room. My concurrent session was very crowded, with only standing room at the back for some presentations. I liked the range of speakers we listened to as the six presentations really broke up the otherwise long session of lecture. The topics expanded from a very specific study which established context, into broader lectures describing challenges faced in studying and working around pollinator species in the context of twenty-first century climate change.

The other attendees all seemed very keen to learn more about the micro-ecology of national parks, and asked questions that mostly focused on the practical and scientific challenges or discoveries within each lecture. Overall, it was an encouraging atmosphere to be around, but I did feel out of my depth being only a university undergraduate student. This conference will definitely not be my last, and I am grateful I was invited to attend.