

Lepidoptera BioBlitz Nets Hundreds of Additional Species

By Paul Opler, Colorado State University

Great Basin National Park held its sixth annual BioBlitz on July 12-14, focusing on Lepidoptera (butterflies and moths). The purpose of the BioBlitz was to discover as much as possible about the diversity of Lepidoptera in Great Basin National Park and to engage citizen scientists of all ages so that they learn about and foster a relationship with Lepidoptera in Great Basin National Park.

Prior to the BioBlitz, 88 butterfly species were known in the park, based on a study by George Austin. Kelly Richers, who is building a computerized database of the moths of Nevada, showed 200 moth species for the park, 167 of which were Macromoths and 33 of which were Micromoths.

A group of seven expert Lepidopterists was invited to lead the BioBlitz team. The experts were led by Paul Opler, Colorado State University, Fort Collins and included David Bettman and Chris Grinter, both from the Denver Museum of Nature and Science; Evi Buckner-Opler; Judy Gallagher, Virginia; Paul Johnson, Pinnacles National Park; Kelly Richers, California; and David Wikle, California. The Nevada State Entomologist, Jeff Knight, and his experienced crew also assisted with the event. Approximately 50 citizen scientists registered for the 2-day BioBlitz, including families from Utah and Washington State, past taxonomist-in-the-park Ken Kingsley, members of the Bristlecone Audubon Society and the Toiyabe Chapter of the Sierra Club, a past artist-in-residence, and a professional photographer.

The BioBlitz began at noon Sunday with an introductory workshop on Lepidoptera led by Paul Opler and Chris Grinter. The workshop included information on Lepidoptera natural history, how to sample and prepare specimens, and how to document butterflies and moths. Then followed a potluck dinner that was enjoyed by all participants.

On Sunday evening there were two demonstration light-sheet set-ups for attracting moths so that participants could view and/or photograph those attracted. The next day, participants divided into three groups for trips to different habitats in the park to look for butterflies and diurnal moths.

At night, ultra-violet light traps were run at a number of locations in different habitats throughout the park. In all, we had 17 or more trap nights of sampling in the Park for the BioBlitz.

During the BioBlitz there were 'blizzards' of adults armyworm moths (*Euxoa auxiliaris*); these were especially abundant in the tree groves at higher elevations and probably numbered in the millions!

At noon on the third day, all the participants reconvened for a closing lunch sponsored by the Great Basin National Park Foundation followed by raffle prizes donated by the Western National Parks Association. Preliminary results were shared. During the BioBlitz we found over 40 butterfly species. One species

added to the park list was the Great Purple Hairstreak (*Atlides halesus*); this brings the Park butterfly list to 89 species. In addition, an estimated 300+ species of moths were added to the park list.

Identification of moths continues long after the BioBlitz. As of the end of September, the results of the Bioblitz for moths is as follows: We had 31 families of moths, including eight Macrolepidoptera (Macro-moths):

Family	Common name	# species
Erebidae	Tiger moths	22
Eutellidae	Euteliid moths	1
Geometridae	Loopers	55
Lasiocampidae	Tent caterpillars	5
Noctuidae	Owlet moths	96
Notodontidae	Prominents	4
Saturniidae	Wild silk moths	1
Sphingidae	Sphinx/Hawkmoths	6
Total		190

The so-called Microlepidoptera comprise the remaining 23 families:

Family	Family
Acrolophidae	Opostegidae
Argyresthiidae	Plutellidae
Blastobasidae	Prodoxidae
Choreutidae	Pterophoridae
Coleophoridae	Pyralidae
Cossidae	Scythrididae
Crambidae	Sesiidae
Depressaridae	Tineidae
Gelechiidae	Tischeriidae
Gracillariidae	Tortricidae
Nepticulidae	Ypsolophidae
Oecophoridae	

So far, we have identified three or four moth species that may be limited to the Park or to the Snake Range, but it will require several years before scientists can make this definite and describe the species.

Scientists who have intensively studied the butterfly and moth fauna in several North American localities, including parks and reserves, have found that a good way to estimate the total moth fauna is to multiply the number of butterfly species by 15. If we do this for Great Basin National Park, we come up with an estimate in the range of 1275 moth species. Adding in the 89 butterfly species makes 1364 for the entire Lepidoptera fauna!

Work will continue with members of our team and as we build a computerized listing of the species found during the Bioblitz and the cumulative list of butterflies and moths known from the park.



Dr. Paul Opler leads a trip to identify butterflies near Stella Lake. NPS Photo by Gretchen Baker



Some of the many moths collected during the 2014 Lepidoptera BioBlitz. Photo by David Hunter



One of over 40 butterfly species found during the Bioblitz. Photo by Paul Johnson



Checking an ultra-violet light trap during the BioBlitz. Photo by David Hunter



Moth specialists sort the thousands of moths collected. Three or four may be new or undescribed species. Photo by David Hunter



Past Artist-in-Residence Kristen Gjerdset sketches an *Arachna picta*. NPS Photo by Gretchen Baker



The BioBlitz included interpretive programs during the day and evening. NPS Photo by Gretchen Baker



Two young citizen scientists help document butterflies in the park. NPS Photo by Gretchen Baker