

**Final report for faculty research grant**

Dr. Jorista Garrie

**Project title:** Insect diversity as it pertains to forest management techniques

**Principle Investigator:** Dr. Jorista Garrie

**College:** CNHS

**Department:** Biological Sciences

**Amount Requested:** \$1,953.00

**Project duration:** August 2018 – July 2020

B.

Long term effects of prescribed burns on insects are varied depending on taxa, habitat, exposure to flames, and life history stage. Fires can affect insects by killing them or by altering their habitats, but insects can also affect fire severity and frequency by increasing fuel loads. Although many beneficial insects inhabit forest ecosystems, such as various pollinators many insects can also be harmful to plant species. Knowing the impacts of prescribed burns on insect assemblages, both pollinators and harmful insects, is needed to maintain healthy forest ecosystems. Our objective is to investigate the impacts of fire on daytime and nighttime pollinators in the Ozark National Forest in NW Arkansas.

C.

The study area comprised eight restoration areas that are sub-sampled using 127 macroplots on the Big Piney and Pleasant Hill Ranger Districts of the Ozark National Forest (96 and 31 respectively). Within each of the chosen sub-set of macroplots we will placed one Malaise insect trap and one Universal Black Light Traps (Bioquip Inc., Rancho Dominguez, CA), to capture night time insects. Traps were deployed 30 minutes before sunset and stopped 30min after sunrise. The proposed project will run from 2018-2020. All captured insects were collected daily, and specimens were identified to family or species, where possible. Insects were counted and dried, and biomass indices estimated and compared between burned and unburned stands, and thinned and un-thinned forest stands.

D.

We found a significant difference in total dry biomass of insects among different burn frequency forest stands, but there was no difference among thinning treatments. Specifically, there was a marginal difference in Hymenoptera (bees and wasps) biomass among thinning treatments, but

fire did not seem to have an effect on Hymenoptera. These results could indicate that different insect species are impacted in varying degrees by different combinations of treatments, and that it depends on the overall goals for the forest as to which treatment is applied.

E.

The project will only conclude in summer of 2020, by which time we should have clear results and recommendations to make to US Forest Service. The first set of results from this project were already presented at the annual meeting of The Wildlife Society, in Reno, NV last year. A portion of the bee and wasp data is being looked at and analyzed by an undergraduate student, who will be presenting her portion at the undergraduate research symposium in April 2020, as well as at the Arkansas Academy of Sciences meeting in April 2020.