Rachel Pak, Fordham University. Bat Activity in an Exurban Landscape and the Impact of LED Light. Mentor: Dr. Clark

Abstract: Bats have many beneficial roles. For example, bats control insect populations, including insects such as mosquitos that are vectors for human diseases. Because most bats are nocturnal, they are difficult to study. Consequently, basic natural history information about most bats species is lacking. Because bats are of increasing conservation concern and because of the vital ecosystem services they provide, additional research into the natural history of local bat species is needed. To address gaps in our understanding of local bats, I chose to survey the bats at the Calder Biological Field Station in Westchester County, NY – an exurban landscape. I conducted passive acoustic surveys of bats during the breeding season using ultrasonic bat recorders at three locations with different landscape features. I found that all six common New York bat species were present at the Calder Center and possibly two other species as well, and that bat activity varied between my sites. I also explored how LED lights affect bat activity. Artificial light is increasingly prevalent in our rapidly urbanizing landscapes. Previous studies of the impact of artificial light on bat activity found a decrease in bat activity in certain bat species and an increase in others in response to artificial light. LED lights are rapidly replacing older types of artificial light, and relatively little is known about how LED lights impact individual bat species. To explore the impact of LED lights on local bat species, I conducted a pilot study using a 5,000 lumen LED work light, which is equivalent to a standard suburban street light, as my light source. A digital timer was used to alternate the LED light on for 30 minutes and off for 30 minutes from 9:00 pm to 5:00 am. I discovered that big brown bats were less active in LED light, but that eastern red bats appear to be more active in LED light. In the future, I hope to explore whether landscape features correlate with increased bat activity and expand the study of the impact of LED light on bat activity.