

Butterfly Survey at the Beaverhill Bird Observatory: A Comparison of Two Loops, Summer 2014

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Introduction:

Butterflies are an important and easily distinguishable species in many ecosystems. Studying butterflies, or recording any type of species, is a fundamental part of biology (Matter, Roland, 2004). If it's unknown what species inhabit an area, then little can be done to protect rare species, or conserve habitat for those who need it (Matter, Roland, 2004). The Beaverhill Bird Observatory (BBO) is located near what once was Beaverhill Lake. The ecosystem is gradually changing around the actual observatory, turning from more grassland style ecosystem to young forest. It is important to record species found in areas that are currently undergoing change, such as the BBO.

This survey aimed to look at two opposing sections, or loops, with the hope of better understanding the butterfly distribution in various regions of the natural area surrounding the observatory. It was hypothesized that there would be a difference in the numbers of butterflies, as well as which species commonly occurring on the two loops. Loop 1 covered a grassland ecosystem, while loop 2 covered a wetlands area.

Methods:

Butterflies were counted in two separate loops in the Beaverhill Bird Observatory (BBO) Natural Area from May 9 2014 until August 31 2014. The Pollard method was applied to help create the two loops, with loop one focusing on the northwesterly grasslands section, and loop two canvassing the marshy northeasterly section of the natural area (Pollard, 1977). Loop 1 started at the BBO and ended at the start of loop 2. Loop 2 ended back at the BBO, and generally Loop 1 and 2 were walked consecutively. Figure one shows a more comprehensive look at the paths covered in each loop. Figure 2 shows pictures taken in August of the two ecosystem types displayed on the counts. While the actual distance of each loop was not measured, average walking time for each was around 30 minutes to make sure that each loop was equal.

Information recorded at the beginning and end of each walk included the date, time, wind strength based on the Beaufort scale, temperature from a digital thermometer, and an estimation of cloud cover. This model was based on recording methods developed during last year's butterfly count at the BBO (Anderson, Roberto-Charron, 2014). In line with Pollard's method, parameters were set out to determine which days would have adequate weather for a count to take place (Pollard, 1977). Conditions needed to be above 10 °C, with no precipitation, between 10-5 pm.

Butterflies were recorded on a visual basis, allowing the person counting to follow a butterfly for a better chance of identification. Butterflies more than 3 m off the path were ignored, generally due to constraints in catching in forested sections. Identification of the butterflies was based on the book *Alberta Butterflies* (Bird, Hilchie, et al, 1995). Butterflies were caught using a butterfly net, identified, and released as per previous year's protocol (Anderson, Roberto-Charron, 2014). Visual identification was only used for morphologically distinct species.

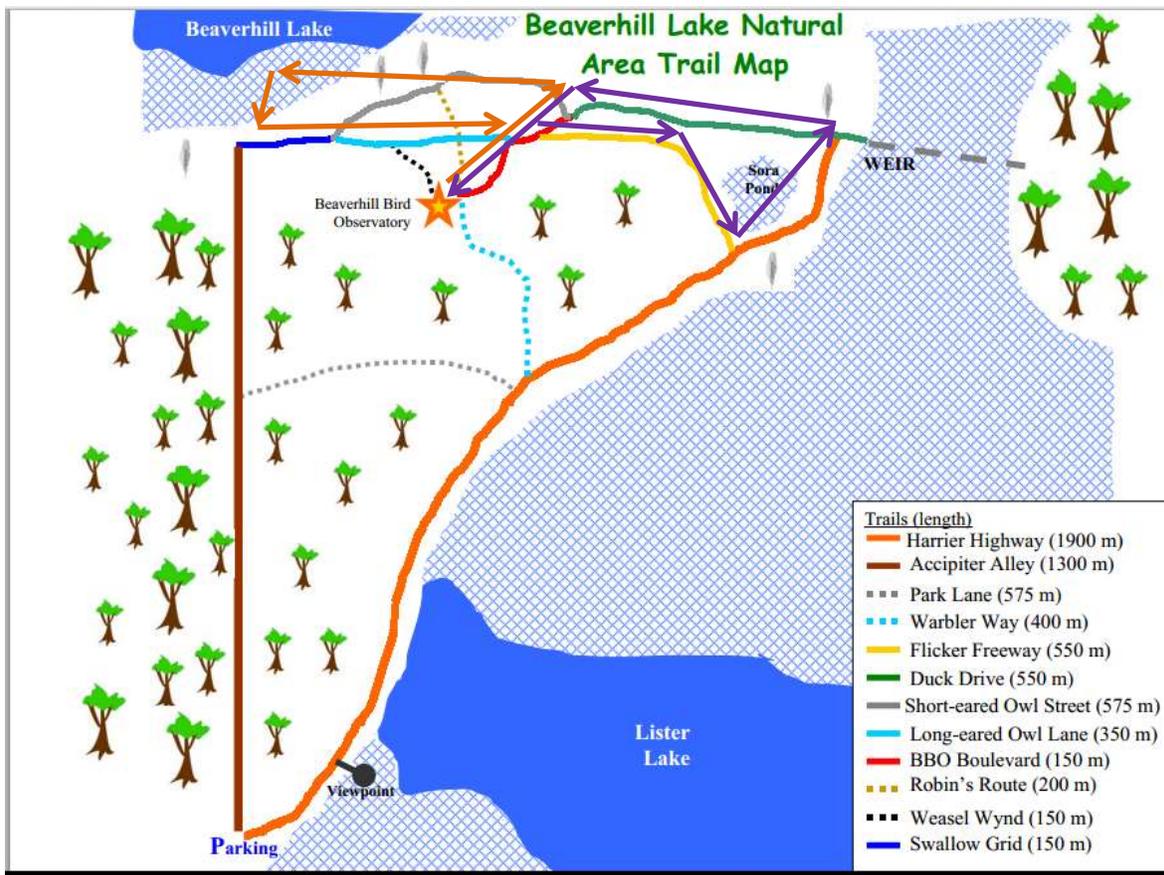


Figure 1: Beaverhill Bird Observatory Trail Map With Loop 1 in Orange and Loop 2 in Purple.



Figure 2: A: Loop 1 Ecosystem, Grasslands. B: Loop 2 Ecosystems, Swamp. C: Loop 1 Ecosystem, Prairie in Bloom. D: Loop 2 Ecosystems, Wetlands Area.

Results:

In total, 18 butterfly counts were completed by either myself or other volunteers at the BBO during the summer of 2014. Of those 18, 15 counts were used to compare the two loops. Some counts were excluded due to only one loop being recorded, and others were duplicates. 24 species of butterflies were recorded throughout the summer, with 432 individuals counted. Loop 1, the grassland-prairie habitat, included a total of 306 individuals, with 22 different species recorded. Loop 2, the wetland habitat, included a total of 126 individuals, with 19 different species recorded. Species not recorded in Loop 2, but found in Loop 1 include the Alfalfa Butterfly, Western White, Hobomock Skipper, Silvery Blue, and Red Admiral. Species not recorded in Loop 1, but found in Loop 2 include the Green Comma, and Great Spangled Fritillary. The other 17 species recorded were found in both loops.

The species diversity, as well as the species distribution, are greater in loop 1 than in loop 2, as can be seen in Figures 3 and 4. The most common butterflies found in each loop also differ. The three most common butterflies observed in Loop 1 were the Greenish Blue with 65 counted, the Common Wood Nymph with 51, and the European Skipper with 46. Loop 2's three most observed butterflies were the Northern Pearl Crescent with 29, the Canadian Tiger Swallowtail with 19, and the Greenish Blue with 13.

For each loop, the number of butterflies found per count was compared on a month to month basis. Figure 5 shows that, on average, more butterflies were caught in July than in any other month of the summer. The average number of butterflies caught per count in loop 1 for the whole summer was 20.4, while loop 2 was 8.4.

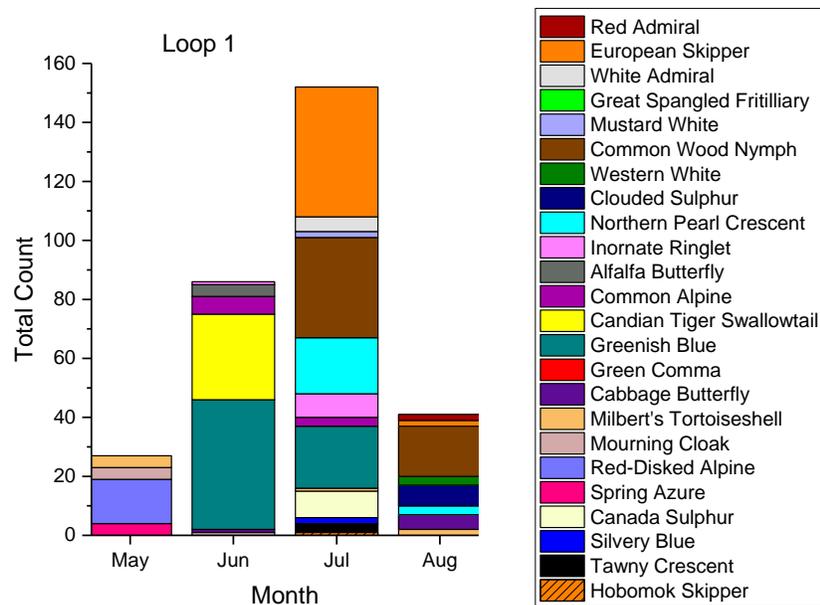


Figure 3: Loop 1 Recorded Butterflies by Species and Month.

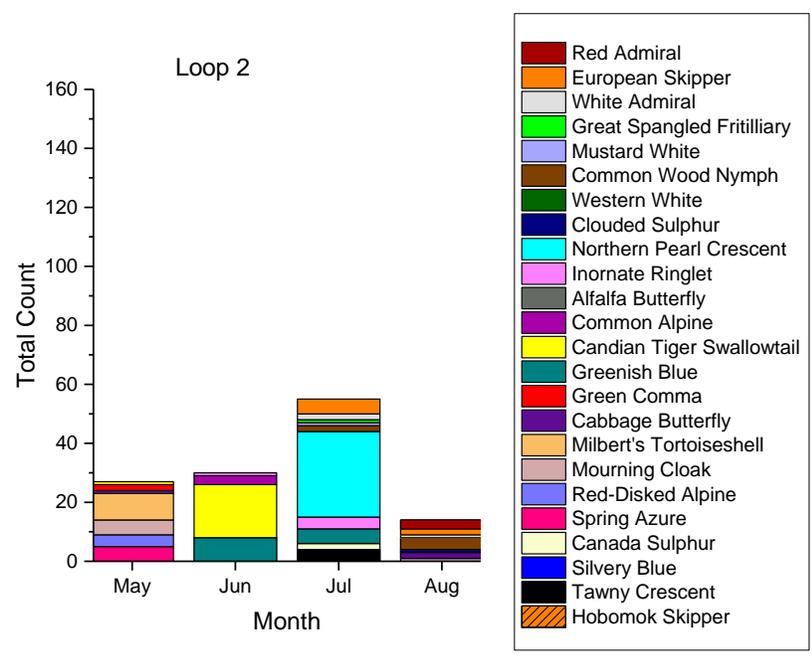


Figure 4: Loop 2 Recorded Butterflies by Species and Month.

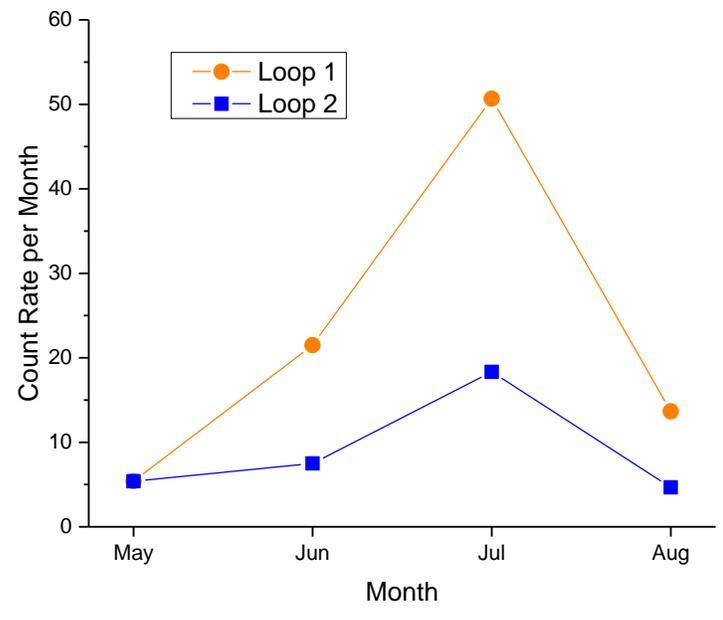


Figure 5: Average Number of Butterflies Observed per Month and per Count. Points were calculated by taking the number of individual butterflies counted per month, and dividing by the number of counts done that month. Numbers of counts per month were: May: 5, June: 4, July: 3, August: 3.

Discussion:

Overall the hypothesis that the two loops showed a difference in number of butterflies and commonly occurring species was correct. Loop 1 had many more butterflies than loop 2, and the most common species were different as well. In order to make sure that the two loops could actually be compared, it was made sure that each would take about 30 minutes for a butterfly researcher to walk. The average number of butterflies observed (Figure 5) was also calculated to be sure that one month was not completely out of the ordinary for one loop. Both loops showed the same trends for the four month period, so we can use the data to compare the loops.

The fact that loop 1 had such higher numbers and more species than loop 2 could be attributed to many different factors. There were more flowers blooming earlier in loop 1 than in loop 2, and loop 1 generally had more sun. By the end of the summer loop 2 had gotten quite overgrown with high reed-like grasses, which generally don't flower or provide much food. Both loops did have a substantial forest section, but most butterflies were observed in the actual ecosystems of interest. This shared ecosystem might be the cause for the still quite high species count in loop 2, even though there weren't as many butterflies. It is possible that the forest might be a cross-over point.

Sources of error may have been the fact that not all observations were done by one researcher. Also, errors in species identification could be possible as well. All species were checked to be sure that they occur in the area and that they fly at the time recorded, as per the *Alberta Butterflies* book. All species were also cross referenced with last year's butterfly data, with no outstanding anomalies found (Anderson, Roberto-Charron, 2014).

Future studies could look at more ecosystem types within the natural area, or look at the weather variables withing the data. A study on just grassland, forest and wetland would be a good follow-up to see why loop 2 had almost as many species as loop 1, but a lot fewer actual butterflies.

Acknowledgments

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Workes Cited:

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