



# The Importance of Poison Ivy (*Toxicodendron radicans*) in Overwintering Bird Visitation Frequency

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## Introduction

The purpose of this research project is to draw attention to and prove or disprove an existing importance of certain native plant species, in this case very specifically Poison Ivy (*Toxicodendron radicans*), to overwintering bird species. This is especially important of plants that seen as ‘nuisances’ and so are often removed. Raising awareness of such species is useful for wildlife conservation and the preservation of biodiversity. Many species of wildlife depend on the many native plants growing in their surrounding territories, especially in the winter when food is scarce, making resources available in the colder seasons even more valuable. This experiment took place in Latrobe, Pennsylvania over a 3-month period from early October – late December 2020.

## Hypothesis

It was predicted that as temperatures decreased with the onset of winter, that bird visitation frequency would increase as the birds in that area would visit and feed on the poison ivy berries that had developed.

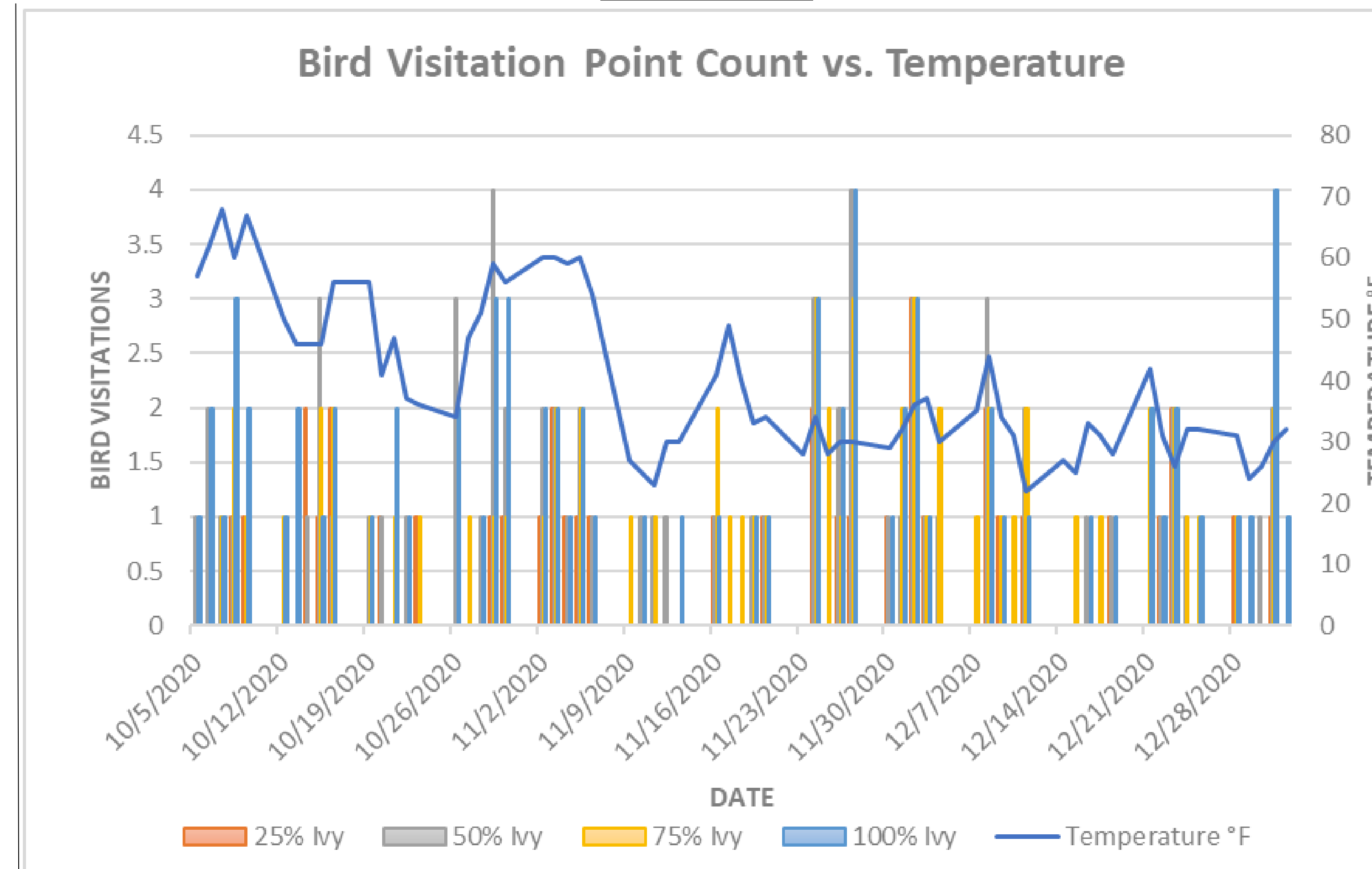
## Methods

In this project, all data was collected in the field daily for 3 months from October 5, 2020, to December 28, 2020. Four quadrants of Poison Ivy patches were chosen according to how much area the ivy was covering. It varied from 25%-100% Poison Ivy coverage. The areas were marked, and stem counts were performed in the quadrants to monitor drupe (berry) development before any bird visitation data was collected. I only collected data on the weekdays to help narrow down the results and for consistency. Data was collected each morning starting approximately when the sun had risen, around 7:00 a.m., as that is when birds are most active. Data collection ended no later than 11:00 a.m. each day to maintain consistency as well as to stay within the peak hours of bird activity. Each morning the temperature would be recorded in Celsius. It was converted to Fahrenheit for ease of viewing. Qualitative data describing the weather was also recorded in case these factors showed correlation with bird visitations. 30-45 minutes were spent at each quadrant waiting on the ground 10 yards away for bird visitation data collection. Binoculars were used to observe bird visitations and behaviors and recorded in a notebook. When birds were observed visiting the quadrant, the species was marked down as well. There were 5 main groups of bird species being considered for this project that overwinter in Pennsylvania and are known to consume Poison Ivy drupes. These included various species of Woodpecker, Thrushes, Warblers, Cardinals, and Titmice and Chickadees which were grouped together due to their flocking behaviors.

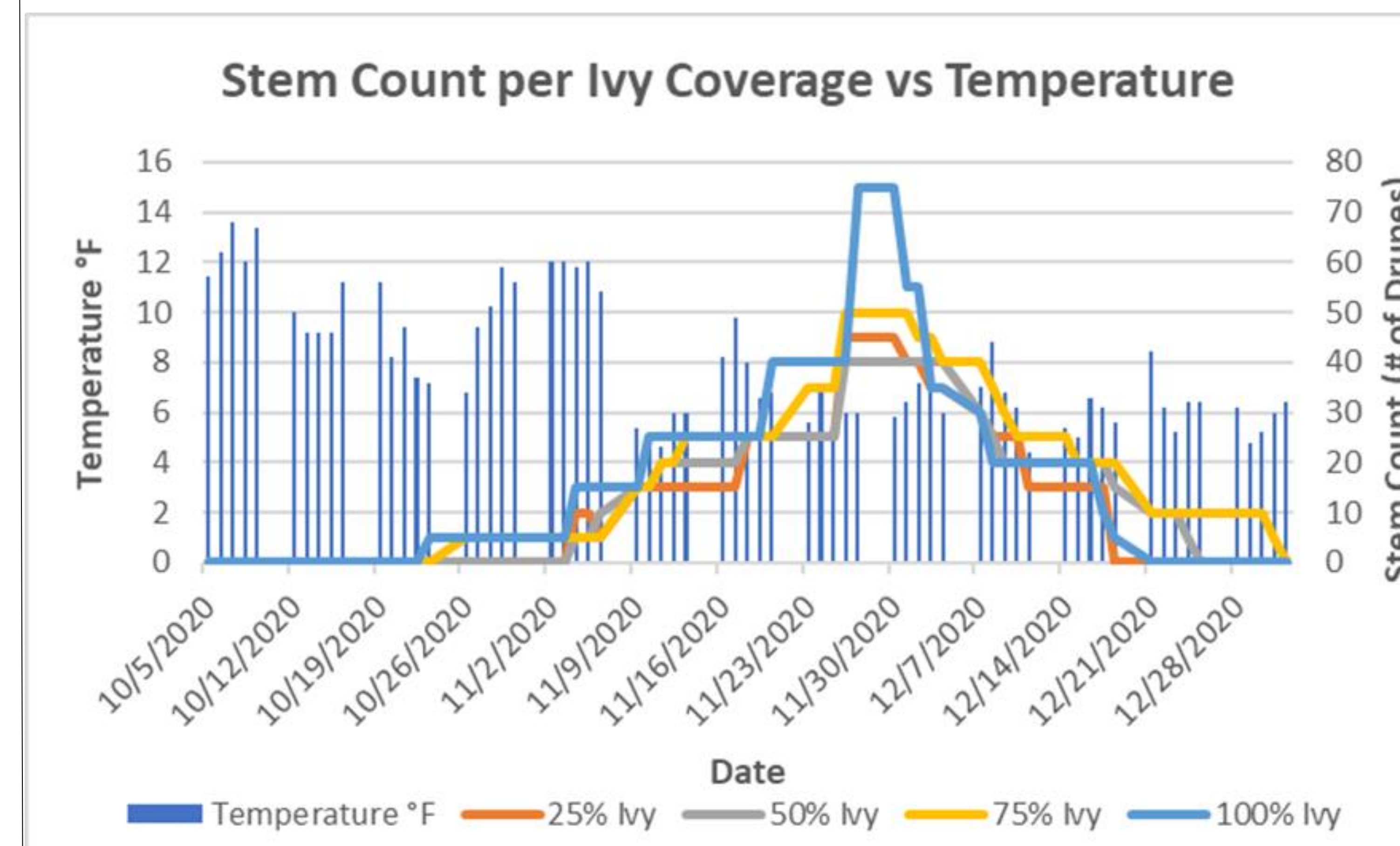
## Results

What was found was that Poison Ivy drupes did not seem to be the preferred source of food, but it became popular as other sources of food dwindled with more consistent cooler temperatures. The autumn months and early winter months were warm and sporadic, making it difficult for the mature Poison Ivy plants to fruit. The Poison Ivy drupes did not develop until the temperatures became colder on a more regular basis. see the bird visitations drop for a few weeks period at the end of October into early November and then spikes again. At that time, the drupes were most developed as well. The drupes were shown to be most important of a resource at the peak of their development.

## Results



**Figure 1.** This graph shows the relationship between bird visitations to the ivy quadrants and temperature in Fahrenheit recorded between 10/05/20 and 12/28/20. The bird visitations were recorded via point count and temperature recorded using a hand-held thermometer. The visitations became steadier with less variance as the temperature became more stable and decreased. This suggests increased activity with more winter-like weather



**Figure 2.** This graph shows the relationship between the amounts of drupes produced by the poison ivy plants in each quadrant, counted between 10/5/20 and 12/28/20. The drupes were counted every day using the stem count method, and the temperature taken using a hand-held thermometer. There is a spike in drupe production as the weather turns colder suggesting that poison ivy needs cooler weather to fruit.

**Table 1.**

	Total Birds	Woodpeckers	Titmice and Chickadees	Thrushes	Warblers	Cardinals
<b>Total Number of Birds Seen (All four quadrants)</b>	244	20	95	78	0	17
<b>Average</b>	1.84	0.151	0.719	0.591	0	0.5
<b>SD</b>	0.912	0.265	0.712	0.512	0	0.459

The above table shows the total amount of birds observed visiting the poison ivy sites. It also shows that Tufted Titmice and Chickadees were the most prominent species to visit the sites.

**Table 2.**

Weather Type	Total Birds Counted
Clear	132
Partly Cloudy	78
Overcast	32

The above table shows that the birds were most active on clear, sunny mornings, rather than cloudy or overcast mornings.

## Conclusion and Further Work

Based on the findings of the data collected, it can be concluded that while decreased temperatures did not directly cause an increase in frequency of bird visitations to the Poison Ivy, a decrease in temperature did directly affect the development of the Poison Ivy drupes, which when they finally reached their peak development, the birds did visit more frequently and the drupe count did decrease shortly after, suggesting that the birds did indeed use these berries as a food resource in the winter months. This data shows that they are an important resource when there is probably nothing else available, but not necessarily the preferred food choice. Further work can and should be done to gain a better understanding, especially due to the inconsistent weather of the 2020 fall/winter season. This could have caused variation in the data and did indeed affect the development of the Poison Ivy drupes. More data is needed on the development and maturation of *Toxicodendron radicans* and notes of other plants available in the area should also be recorded as well as the visitation frequency to those. Many more quadrants would need to be observed for a longer period of time as well as in more detail to better understand the relationship between birds and this plant. It would also be useful to study the behavior of these birds around these plants in more depth, such as signs of territoriality. ArcGIS could be used to build a spatial relationship map between Poison Ivy coverage and bird visitation frequency. Ideally, this study would take place at the end of the summer before fall, and until after the drupes are gone into the late winter. It would have been helpful to find more mature plants than had been in this study, as there were not a lot of options to choose between for study sites.

## Sources:

- McNair, J.B. (1925). "The Geographical Distribution in North America of Poison Ivy (*Rhus toxicodendron*) and Allies". *American Journal of Botany* (12), No. 6, pp 338-350. URL:<https://www.jstor.org/stable/2435340>
- Jelesko, J. (2021). Assessing poison ivy (*Toxicodendron radicans*) presence and functional traits in relation to land cover and biophysical factors. *Physical Geography*, 1–24. <https://doi.org/10.1080/02723646.2021.1883802>
- Suthers, H.B., Bickal, J.M., and Rodewald, P.G. (2000) "USE OF SUCCESSIONAL HABITAT AND FRUIT RESOURCES BY SONGBIRDS DURING AUTUMN MIGRATION IN CENTRAL NEW JERSEY". *Wilson Bull.*, 112(2), 2000, pp. 249–260. URL:[https://waingerlab.cbl.umces.edu/SupportingLiterature/LiteratureReviewDiagrams\\_Literature/Shrubs/Suthers\\_et\\_al\\_2000.pdf](https://waingerlab.cbl.umces.edu/SupportingLiterature/LiteratureReviewDiagrams_Literature/Shrubs/Suthers_et_al_2000.pdf)



Poison Ivy drupe and plant pictures taken in Latrobe, Pennsylvania, October 2020.