The Impact of Insect Diversity and Conservation Education on Willingness to Support Pollinators

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Background

Conservation of pollinator species is essential to both human and environmental health. Implementation of pollinator habitats (commonly known as pollinator plots or bioswales) is especially important as rapid urbanization continues to increase. Pollination is critical to the reproduction of wild plants as well as crops grown industrially through agricultural practices. However, public perceptions of pollinator benefits and environmental health have a key role to play in increasing this implementation. Our team assessed how the use of educational data derived from the Kansas State University Campus on the benefits of bioswales and pollinator plots on insect diversity/abundance directly impacted the perceptions of students and faculty on campus through survey distribution. We used this survey to measure the student's and faculty's willingness to both adopt pollinator conservation practices at their own residences and support implementation in public spaces.

Methods

Pollinator Sampling Methods-

Four study areas on K-State campus were defined using sized and vegetation cover as prerequisites. A mowed grass lawn with little value to pollinators was used as the null. Pollinator plots were sampled for both plant and insect metrics. Vegetation density was measured using a Robel pole, total species number and vegetation composition were measured by visual observation. A Daubenmeir frame was used to define the sampling area. Pollinators were sampled by visual observation over a period of two minutes. Both insects counted in the frame and insects which flew over the frame in the allotted time were included in the total count.

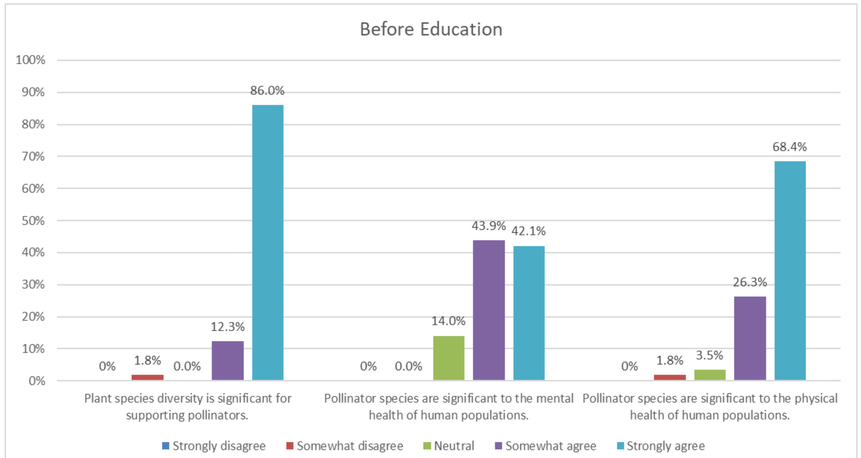
Survey Methods-

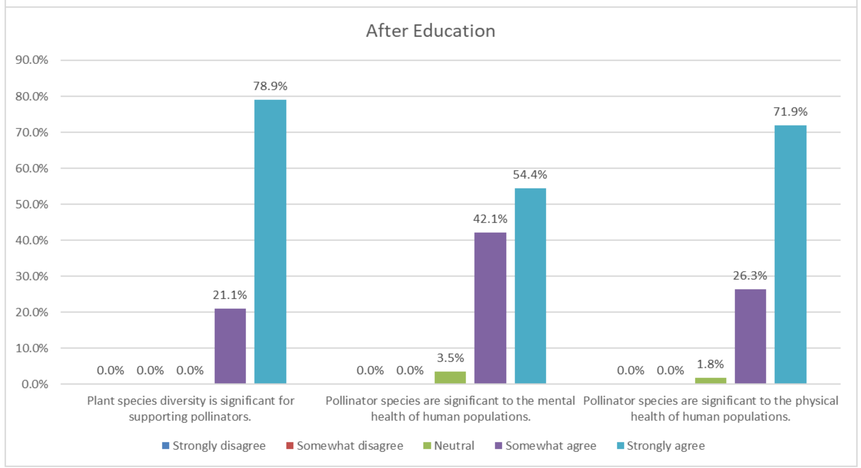
The survey was conducted on the Kansas State University Campus population. We sent the survey out to K-State undergraduate students, graduate students, faculty, and staff across all departments and all responses were anonymous. We used the Qualtrics platform to create the survey, and it was distributed via flyers placed around campus and electronic links via email. We wanted to compare the difference in people's answers based on their backgrounds and areas of study to compare the impact of these factors on the participant's social perceptions. The survey consisted of a "Before Education" section, an educational video link, and an "After Education" section.

Results

When results from all pollinator study areas are combined and statistical correlation is performed, results of the study showed greatest positive correlation between mean vegetation obstruction rating and insect count at 0.887 while positive correlation was also found between mean vegetation obstruction rating and insect richness at 0.62 and plant richness and insect richness at 0.559. The highest average of insects counted per plot was the Art Museum at 14.25. The Art museum also showed the highest visual obstructive rating. As expected, the mowed lawn hosted very few insects, averaged 3.66 per plot, compared to the pollinator plots which hosted more than 300% more insects on average. Memorial Stadium had the highest mean Lepidoptera and Apoidea count at 0.9166 and also had the highest mean plant species counted at 7.583.

The survey was open to all students, faculty, and staff as Kansas State. 77% of participants were undergraduate students while only 6% were faculty and staff. 58 participants completed both before and after survey questions. Overall, responses became more agreeable towards protecting pollinators. 12 answers of disagree and neutral were given before education while only 3 were given after. Strongly agree rose by 12.3% and 3.5% in two categories, respectively. 90% of participants wished to help pollinators but listed barriers to helping including "time" and "cost". Of the 13 responses already owning homes and/or property, 62% already had pollinator plots at their residence while 15% said they did not.





Main Takeaways

The survey was successful in creating more positive perceptions of pollinators. Both levels of agreement and willingness rose after viewing the educational video on their benefits. The increase in perceptions leads to increased conservation for pollinators. The survey could have been improved due to our educational video being over thirteen minutes long. Many participants did not complete both before and after questions. With an increased perception of pollinators, K-State will get increased willingness to support pollinators and campus efforts to protect them.

The pollinator sampling portion of the research supported many of the scientific articles we reviewed while preparing for the display of our findings. There were several avenues of sampling we could have prioritized to help diversify the information already known in this field such as the sampling of nocturnal pollinators, the monitoring of soil chemistry, and the overall classification and composition of bioswale vegetation. With these areas being explored certain campus initiatives can be applied, such as lights off in building without occupants or the recharging of soil nitrogen and carbon to support a larger diversity of vegetation in the bioswales scattered around campus.

Future Work

When collecting resources to help support our hypothesis we found a lack of research to nocturnal pollinators. Many nocturnal insects are responsible for the transportation of pollen. Implementing nocturnal pollinator research would also introduce the various adaptations and evolutions of many types of vegetation to ensure the pollination of certain species. Public perception of the aesthetics of how pollinator plots and bioswales are perceived by the public. Sampling public perception showed that when educated students agreed with the incorporation of bioswales and pollinator plots. Covering the perceived aesthetic can also help assist in spreading these techniques and incorporation to other demographics of metropolitan and urban areas.