Naturally Inspired Restoration, Education, and Research at St. Anne’s Episcopal School

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INTRODUCTION

In an attempt to create a more natural campus, reduce maintenance, associated costs, and increased outdoor education opportunities for Preschool to Eighth grade, St. Anne’s Episcopal School has completed several phases of a multi-phase campus restoration. St. Anne’s campus was formerly dominated by over 40 acres of mowed grass and weed infested beds. The surrounding 85 acres is farmed with two wooded areas for exploration. A team at St. Anne’s has developed a multi-phase plan to increase pollinator and migratory songbird habitat, increase reforestation, and decrease non-point source pollution to the coastal waterways, while creating different habitat spaces for exploratory learning experiences.

The restoration was done in alignment with established curricular goals, to increase access to green spaces and a diversity of habitat areas for students, to share with Urban Promise students when they visit our campus, and our greater community through service projects and outreach. Additionally, we aspire to increase stewardship of current environmental concerns such as the plight of the monarch, native bees, small mammal and ground nesting birds (Frezonova and Jomova, 2015; Otto and Pensini, 2017). Studies show that students in schools with greener spaces tend to perform better academically, are healthier (physically, mentally, and socially), have a sense of place, and develop civic attitudes and behaviors (UWSP, 2018). At the same time outdoor education provide an educational setting for learning and “refueling in flight” leading to an increase in engagement and information retention once back inside the classroom, while at the same time reducing behavior problems such as attention deficit, and constant movement (Kuo et al., 2018). Green school spaces provide a level playing field for all students to thrive regardless of socioeconomic background (Kuo et al., 2018).

St. Anne’s has initiated a pilot project for student research on campus and began a collaborative study with multiple schools, creating a statewide partnership in data collection on the monarch through the citizen science program through the University of Minnesota Monarch Lab. Outdoor education provides a natural platform for exploration and wonder. Citizen science enhances opportunity for science learning; creating a natural immersive program through the University of Minnesota Monarch Lab. Outdoor education provides a natural platform for multiple schools, creating a statewide partnership in data collection on the monarch through the citizen science program, a statewide data collection on the monarch through the citizen science program, all students to thrive regardless of socioeconomic background (Kuo et al., 2018).

We were fortunate to have the support and expertise of state and federal partners to plan, develop, and grow our restoration effort. We have met challenges in area maintenance in relation to watering and weeding. We have overcome some of these challenges with volunteers to pull weeds, deepline irrigation and timers for watering, and installing native ground cover plants to reduce the overall need for weeding. The next phase will include the re-forestation of a 3-acre meadow into a pine forest area, to increase the diversity of our campus ecosystem and sensory experiences. Rarer native trees, for Delaware and the region, were selected to allow for a greater exposure of tree species.

In progress is a habitat maintenance manual, a school garden, a silo observatory, bird blind area (overlooking the adjacent waterway to view coastal migratory waterfowl), farm dump clean-up with river restoration and trail creation. Campus restoration efforts now include focuses on potential research for the student science fair projects as well as the surrounding community. In the area of education we will continue to provide professional development opportunities for faculty and staff, connect with statewide partners, and use the future development of an outdoor education center to develop community service opportunities such as growing food for our local zoo, donating to the Food Bank of Delaware, and native plant cultivation and sales. Our ultimate goal is to get each student outside for one lesson every day.

DISCUSSION AND OUTCOMES

To date the team has successfully converted 0.35 acres of mowed grass and planted beds surrounding the school, with a diversity of vegetation that increases infiltration and reduces nutrient runoff into the adjacent covey. The plantings included a variety of native shrubs, grasses and groundcover, each selected to increase the habitat for pollinators and neotropical migratory songbirds. A 0.50 acre bird plot area with a variety of native trees and shrubs that would support a more robust ground nesting and songbird population on campus, which was created from formally mowed grass. Additionally, a 0.12 acre of mowed grass was converted to a little bluestem meadow surrounding the outdoor classroom. A meadow habitat was created, for pollinators and ground nesting birds, by converting 6 acres of formally mowed open space to a diversity of warm season grasses and self-seeding flowering annuals. Aggressive invasive species control (through herbicide application from back-pack and boom sprayers), annual prescribed burning, and drilling of the native seeds (with a no-till drill) are being employed to increase the success of the meadow restoration.

We have incorporated education into the restoration project through multiple tree plantings with Delaware Forestry Service, a school wide native plant installation day where we planted over 2,000 plants in one day, as well as teacher professional development including an orienteering activity and Project Learning Tree training. During the summer of 2018 a group of volunteers cleared 8 spaces within our wooded areas for outdoor education meeting places. These spaces have been well utilized thus far by all grades and continue to be developed.

The research pilot project started in conjunction with our school’s science fair when a 5th grade student chose to participate in the citizen science program led by the University of Minnesota Monarch Lab that was conducted at Bombay Hook National Wildlife Refuge in Smyrna, Delaware. In a collaborative effort with Refuge staff, the student was trained on the monarch butterfly data collection protocols, made weekly surveys of the transects, and compiled and analyzed the data to present at the Delaware Association for Environmental Education (DAEE) and science fair. The student was also invited to participate in and present her research and experience in a presentation at the Magisal Monarch Workshop, a state organized professional training, for teachers and master gardeners. The same student expanded her research during the consecutive summer and will present at the 2019 DAEE meeting as part of her research and science fair in 8th grade. The line transect study has expanded to a statewide collaborative effort at the Jefferson School in Sussex county and Las Aspiras Academy in New Castle County. Efforts of develop student collaboration among the schools began in the summer of 2018 with plans on continuing that effort during the summer of 2019. We will continue to seek additional citizen science projects that support, facilitate, and extend science learning for our students.

CONCLUSION AND NEXT STEPS

Success of this project is the result of many partnerships that were developed, which included: United States Fish and Wildlife Service (Bombay Hook NWR and Delaware Bay Project), State of Delaware’s Non-Point Source Program and Watershed Assessment Section, the Delaware Forest Service’s Urban and Community Forestry Program, Blackbird and Redden State Forests, and Sussex Landscaping LLC.

REFERENCES

UWSP, Outdoor Education - Research summary, University of Wisconsin St. Paul.