

Literature Review: Prophetstown State Park Visitor Center Native Plant Garden

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Prophetstown State Park is Indiana's newest state park, located where the Tippecanoe River meets the Wabash River, northeast of Lafayette, Indiana. Prophetstown's landscape has been shaped by the recession of glaciers 10,000 years ago, fire, animals, and human hands. Fourteen Native American tribes are noted to have existed on the land where Prophetstown now lies, joining in revolution and empowerment. The park exists to both honor this heritage and restore the original habitats of the land (Indiana Department of Natural Resources [IN DNR], 2025). In order to do so, the park offers a multitude of spaces to experience, including campgrounds, picnic areas, hiking and bicycle trails, the Farm at Prophetstown, an Aquatic Center, accessible scenic viewing points, shelters, a Native American village, a visitor center, interpretive naturalist services, and much more (IN DNR, 2013). In September of 2024, the Lilly Endowment awarded a \$50 million grant for Indiana State Parks, a "significant milestone in Indiana State Parks history," said Dan Bortner, Indiana Department of Natural Resources (DNR) director (IN DNR, 2024). \$25 million of the grant has been invested into Prophetstown State Park, \$8 million of which will be used to create a Prophetstown Heritage Center, which will include a visitor center, outdoor exhibits, and a recreated and relocated Native American village and educational center (Martorano, 2024).

As a group, our contribution to Prophetstown State Park's new endeavors is the preliminary planning of a native plant garden that will surround the visitor center. The garden is meant to serve as an educational first impression of the park, encompassing all of the habitats present within the park: tall grass prairie, fen, river, and oak savanna. We work closely with Jenna Parks, the Interpretive Naturalist for the Indiana DNR at Prophetstown State Park. Jenna and her team will oversee the operations within and associated with the new visitor center at

Prophetstown State Park. She emphasizes the importance of educational opportunities, the convergence of cultures and habitats within the park, and Native American heritage when working on our preliminary ideas. This review is meant to aid us in the planning of a native plant garden that will surround the newly constructed visitor center for Prophetstown State Park, as we bring Jenna's vision to life. This literature review examines the importance and impacts of native plant gardens for biodiversity, habitat restoration, and awareness and education. Additionally, it explores the dangers of implementing cultivars within these restoration projects, as well as emphasizes Native American heritage on the land of Prophetstown State Park and beyond.

NATIVE PLANTS IMPORTANT FOR BIODIVERSITY

Native plants are vital to support biodiversity and maintain a healthy ecosystem. In both habitat restoration sites and more urban-landscaped settings, research has found that native plants increase biodiversity and ecosystem stability. Tallamy et al. (2021) found that introduced non-native plants lead to insect population declines - as they are not always edible to the insects - and also decrease the diversity of native plant communities through competition. Similarly, Richard et al. (2019) studied Lepidoptera and Hymenoptera insects in native and non-native edge habitats and concluded that the non-native sites had similar plant species richness and higher plant biomass but 68% fewer caterpillar species, 96% fewer caterpillar biomass, and a 5.4 times lower productivity index among Lepidoptera. This study concluded that non-native plants eliminated the ability of specialist species to exist in the sites without their coevolved native plants and the researchers suggest that the impact on biodiversity is likely greater than their final estimate due to the effects through upper trophic levels (Richard et al., 2019). Birds then can be used as an indicator for ecosystem health and understanding these higher effects in food webs. Both Rosenberg et al. (2019) and Narango et al. (2018) found that non-native plants led to a

decrease in bird populations. Grassland bird species were found to have the greatest population loss and it is attributed to habitat loss, toxic pesticides, urbanization, and decreasing insect populations (Rosenberg et al., 2019). Insectivorous birds are often missing from more landscaped settings, such as lawns, due to the choice of non-native ornamental plants that don't support the necessary insect food sources (Narango et al., 2018). There is a clear connection through the presence of native plants and the ability of that site to sustain the biodiversity of its food web. Native plant guides further stress this point by including pollinator information for each species entry to ensure the base of the food web is well established (Childs, 2022). All of these sources emphasize the importance of planting native plants and managing non-native plants in all types of landscaping and habitat restoration projects.

ENVIRONMENTAL COST OF CULTIVARS

With one of our main goals of this project being to only use native plants to Tippecanoe County and the habitats within the state park it is very important that we are cautious of cultivars. Cultivars are plants that have been selectively bred for desired traits and as a result are genetically distinct from the original native plant. While cultivars can have many benefits like disease resistance, adaptability to specific growing conditions, and aesthetic appeals, they might have detrimental effects to our project if not carefully considered. If planted in large quantities through a habitat they can have a significant impact on genetic diversity and can cause other plants to become more susceptible to environmental stressors. This risk may be high in modified landscapes because pollen dispersal can be extensive, particularly in ecosystems with large planted populations and small populations of remnant vegetation. (Byrne et al., 2011). This is important to keep in mind as we develop our native plant list and placements of plants as our goal is to protect and enhance the biodiversity and genetic health of the park. Ensuring that we

are only including native and naturally-grown plants is crucial to the success of this garden and meeting the goals of our community partner Jenna Parks.

Many species have become severe weeds when introduced by man into environments outside their normal range, often as garden plants. On occasion, such introductions can then freely hybridize intergenerically with native, related, species (Chandler & Dunwell, 2008). Choosing the most appropriate population source (non-cultivar or cultivar) for ecological restoration may depend on a number of factors including the restoration size, degree of disturbance, distance to remnant communities, and the restoration goal (Lambert et al., 2010). As our goal is to enhance the native populations included in this design, avoiding genetically modified plants to ensure that growing conditions don't become modified is critical. In all of the studies analyzed by Garbowski et al. (2021), traits which were found to improve plant performance were not those that are traditionally selected for during cultivar development. Given all of this literature, cultivars can be helpful in certain cases to help improve the survival of the species, but that does not align with the goals of this project as our priority is the flourishing of native species.

ENVIRONMENTAL AWARENESS AND EDUCATION

Another main goal of this project is to promote environmental education. Our garden will contain many new learning aspects for park visitors. They will have the opportunity to read signage to understand the native uses of plants, what habitat the plants come from, and much more about the habitats being restored within the state park. Environmental education is so important because it can promote environmentally friendly behaviors. This was highlighted by Spiteri in his article when he said “environmental learning in the early years is associated with

pro-environmental behavior later in life” (Spiteri, 2021). By teaching the youth the importance of the environment, we are paving the way to support the environment in future years.

Going hand-in-hand with environmental education is environmental awareness. By educating the public, we will make them aware of the issues the environment currently faces and how they can potentially help. “Environmental awareness is a critical component of environmental protection” (Pramita et al., 2023). By making the public aware, you are giving them an opportunity to learn. Learning is the key to success. It is critical that we make the public aware about the environment. One cannot help save something that they don’t know about. Through our garden, we hope to provide enough insight to intrigue people about how important native habitats are to restore.

NATIVE AMERICAN HISTORY

Native American History was a founding factor of Prophetstown State Park. Prophetstown was not merely a political or military outpost but also an intellectual and spiritual hub that represented a broader indigenous movement (Peterson, 2008). Tenskwatawa, also known as “The Shawnee Prophet,” gave religious teachings in Prophetstown and emphasized purification and the rejection of European goods and influences, reinforcing Native sovereignty and identity. His brother, Tecumseh, on the other hand, focused on military and diplomatic strategies to resist U.S. expansion.

Archaeological investigations at Prophetstown have provided further insights into the indigenous presence in the region. Strezewski et al. (2006) conducted excavations at Site 12-T-59 and other locations within Prophetstown State Park, uncovering evidence of long-term Native American occupation predating Tecumseh and Tenskwatawa’s settlement. Artifacts such as pottery, stone, tools, and remnants of dwellings suggest that the area had been inhabited by

various indigenous groups for centuries. The settlement's location near the confluence of the Wabash and Tippecanoe Rivers made it a strategic stronghold, both for defense and for sustaining a self-sufficient community. Swain's (2002) research emphasizes the broader implications of Prophetstown's destruction, as it signified a military loss but also a cultural and political setback for indigenous groups in the region.

Additionally, research on culture-based tourism has highlighted Prophetstown's potential to serve as an educational and historical attraction. Florristal (2009) explores the ways in which Prophetstown's rich Native American heritage can be leveraged to create meaningful cultural tourism opportunities. The study emphasizes the importance of integrating historical narratives into tourism initiatives to enhance public awareness and appreciation of the site's indigenous significance. By promoting Prophetstown as a site of cultural learning, there is potential to foster greater recognition of Native American history and contributions (Florristal, 2009).

Today, Prophetstown State Park serves as a reminder of this complex history. The park features interpretive exhibits that educate visitors about the indigenous presence in the region with their ties to the native habitat's plants and the broader struggle for Native American rights and sovereignty. By restoring and studying sites like Prophetstown from an environmental perspective, we can explore the connection that Native Americans had to the native plants to educate park visitors on the importance of both native habitat and the indigenous history of the area.

CONCLUSION

Designing the proposed native plant garden for the Prophetstown State Park creates a unique opportunity to utilize both scientific literature to approach the environmental aspect of habitat restoration, as well as social and historical research to incorporate public education

techniques and the significance of Native Americans' history to the state park. The literature reviewed above supports the multidisciplinary approach needed to design the native plant garden. There is a consensus in the scientific literature that native plants, specifically non-cultivar plants, will provide benefits to the biodiversity of the park even on the landscaping scale of a garden. Further research to understand how cultivars and competing non-native plants are likely to impact management of the garden could be beneficial to the planning process. This native plant garden will hopefully promote increased public awareness amongst park visitors and create meaningful, sustained knowledge about the long history of the Native Americans on the land and natural resource management.

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