



the Bluestem Banner



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Tallgrass Ontario

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Ohio Spiderwort (*Tradescantia ohiensis*)

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Inside the Bluestem Banner

- Update on the Species at Risk Stewardship Program Grant Award for Purple Twayblade* Page 2
- A National Urban Park in Windsor Ontario* Page 9
- Notes on Native Plants: Ohio Spiderwort (Tradescantia ohiensis)* Page 10

Update on the Species at Risk Stewardship Grant Award for Purple Twayblade at Tallgrass Prairie Heritage Park, Windsor Ontario

By: Season Snyder, Karen Cedar and Hillary Brunner

In November 2021, Tallgrass Ontario (TgO) received a Species at Risk Stewardship Grant from the Ministry of Environment, Conservation and Parks (MECP) to restore habitat for two (2) species at risk: Butler's Gartersnake (*Thamnophis butleri*) in Black Oak Heritage Park and Purple Twayblade (*Liparis liliifolia*) in Tallgrass Prairie Heritage Park, both located within the City of Windsor. The City owns and manages these natural areas as habitat for many rare plant and wildlife species, as well as for passive recreation activities. Both Black Oak Heritage Park and Tallgrass Prairie Heritage Park are part of the Ojibway Prairie Complex and the Ojibway Prairie Remnants Area of Natural and Scientific Interest (ANSI).

This article is focused on the work undertaken by TgO and the City of Windsor to better understand the population and habitat requirements of Purple Twayblade in Tallgrass Prairie Heritage Park, and to undertake habitat restoration in the species preferred habitat. The project was designed with the MECP's goal for the recovery of Purple Twayblade in mind, which is to maintain existing or newly discovered extant populations and support increases in abundance and distribution by reducing threats and addressing biological limitations, where feasible and appropriate.

The objectives of our project were four-fold:

- 1). Confirm the population status in Tallgrass Prairie Heritage Park, including plant searches and counts, reproductive status (flowering/not flowering), habitat descriptions, and search for potential areas where assisted seed dispersal may be feasible.
- 2). Restore habitat for Purple Twayblade in Tallgrass Prairie Heritage Park through prescribed burns.
- 3). Create an educational pamphlet for the public which highlights the threats to Purple Twayblade and measures that can be taken to help mitigate those threats.
- 4). Mitigate the threat of invasive species by installing new educational signage and boot/bike tire cleaning brushes at trail entrances.

Species Status and Description

Purple Twayblade is listed as Threatened under the provincial Endangered Species Act. It is a small terrestrial orchid that grows between 10 cm and 25 cm high. It has two fleshy, oval-shaped leaves from which a single flowering stem arises in late May through early July. Between 5 and 30 flowers are arranged along the stem and are clustered toward the top. The petals are purple to brown in color, with a lower lip streaked with a fine network of reddish-purple



Photo 1: Purple Twayblade is provincially Threatened and has a Conservation Status Ranking of S2S3 (Imperiled/Vulnerable, at risk of extirpation due to limited range, few populations or occurrences, and threats). Photo: Tallgrass Ontario.

veins. The fruit of Purple Twayblade is a capsule, usually about 1.5 cm long, which contains a large number of dust-like seeds which may be widely dispersed by wind.



Photo 2: Purple Twayblade's mauve-colored flowers with reddish-purple veins (a) in June. Petals are delicate and almost translucent. Seed capsule formation (b) in July. Photo: Tallgrass Ontario.

In Canada, Purple Twayblade is found primarily in southwestern Ontario, with three populations known farther east, one in the Regional Municipality of York, one in Simcoe County, and one in Frontenac County (Photo 3). There is also one population in western Quebec (near Montreal) that has extended the known Canadian range eastward. The total population of Purple Twayblade is estimated to be 3,310 plants, with most populations consisting of fewer than 30 plants.

In the Ojibway Prairie Complex, Purple Twayblade has been recorded in Ojibway Park, Spring Garden Natural Area, Black Oak Heritage Park, the Ojibway Prairie Provincial Nature Reserve and Tallgrass Prairie Heritage Park. With the exception of Spring Garden Natural Area, the last recorded populations were all under 30 plants (ECCC 2018).

The last record for Tallgrass Prairie Heritage Park was six (6) plants in 2008 (ECCC 2018).

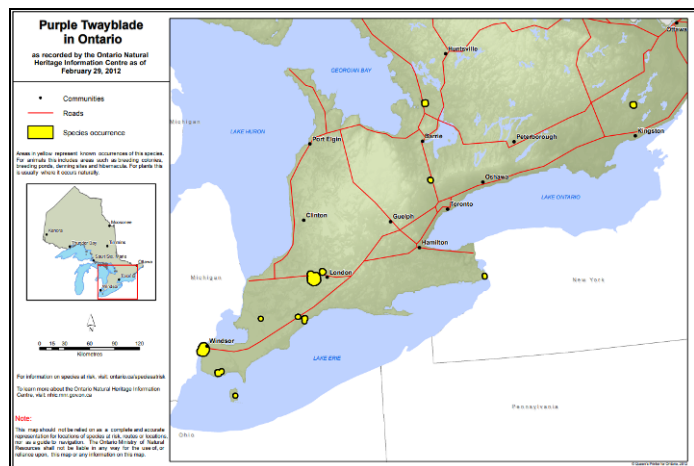


Photo 3: Distribution of Purple Twayblade in Ontario. Source: Government of Ontario (Ministry of Natural Resources): https://files.ontario.ca/environment-and-energy/species-at-risk/purple_twayblade_map_eng.pdf

Species Biology and Habitat Requirements

Purple Twayblade is a perennial wildflower in the orchid family (Orchidaceae). It is considered an early colonizing species that may populate a new area quickly, but then rapidly decrease in number. It has been recorded in a variety of habitats and soil conditions, from deciduous forests and forest swamps to open and semi-open oak savannah and woodland (Photo 4), and tallgrass prairie (ECCC 2018 and MECP 2019). Purple Twayblade also appears to favour moist soil conditions but may tolerate wet and dry habitats as well (ECCC 2018).

An important component of the habitat of Purple Twayblade is the presence and abundance of specific soil fungi called mycorrhizae. Mycorrhizal fungi form symbiotic relationships with orchids. This relationship is critical to the orchid's existence. Orchid seeds and seedlings require mycorrhizae to provide nutrients until the plant is capable of photosynthesis. In the case of Purple Twayblade, it forms this relationship with mycorrhizae in a specific genus called *Tulasnella*. In research trials, the successful germination of Purple Twayblade was almost entirely limited by the distribution and abundance of *Tulasnella* fungi, suggesting that mycorrhizae may affect the presence or absence of Purple Twayblade more than other habitat characteristics (McCormick et al. 2012, cited in ECCC 2018).



Photo 4: Black Oak woodland in Tallgrass Prairie Heritage Park after the spring 2022 prescribed burn. The habitat conditions support a healthy population of Purple Twayblade. Photo: Tallgrass Ontario.

Lastly, Purple Twayblade relies on successful cross-pollination for reproduction but very little is known about how it is pollinated. Like other orchids in the genus *Liparis*, Purple Twayblade is believed to be pollinated by flies (Diptera). In comparison to other insects, Dipterans are considered poor pollinators. Although they may visit plants frequently, the visits do not always result in pollination. This could be a reason why seed capsule development is reportedly very low in Purple Twayblade (Whigham and O'Neill 1991, cited in ECCC 2018), which has implications for the species seed bank development and long-term survival.

Threats to the Species

The government's Recovery Strategy identified the major threats to Purple Twayblade as habitat loss from development (i.e., urban, residential, agricultural); invasive plants; and alterations to the natural disturbance regime (e.g., fire suppression) (MECP 2020). Lesser-known threats have been identified as herbivory, especially by White-tailed Deer (*Odocoileus virginianus*), invasive invertebrates (i.e. slugs, snails and earthworms), prolonged flooding, and pesticide applications (ECCC 2018, MECP 2019).

The Recovery Strategy also recognizes several knowledge gaps related to Purple Twayblade's status, biology and threats (MECP 2020). Our project activities and objectives were designed to help achieve positive results toward meeting the high priority actions in each of the Recovery Strategy's focus areas: Research and Monitoring; Management and Habitat Protection; Awareness (MECP 2020).

Confirmation of Species Status and Suitable Habitat

Historical aerial images of Tallgrass Prairie Heritage Park were reviewed to better understand the type and extent of disturbance that occurred in the area in the past. Agriculture was the dominant land use in the 1940's to early 1960's (Photo 3). Still, significant tracks of open natural vegetation existed. These areas were likely comprised of tallgrass prairie and meadow communities. Between 1970 and 1990, land use changed significantly. Residential development began along the edges of the Park and utilities and associated corridors were established through the site. Abandoned topsoil and sand quarries resulted in the creation of ponds of varying depths. Other areas of the Park were described as tallgrass prairie and meadow, successional fields, Oak savannah, and young Oak-Poplar woodlands (ERCA 1992).



Photo 5: Aerial photograph of the Tallgrass Prairie Heritage Park area in 1948. Agricultural disturbances are visible, but other areas contained native savannah and prairie plant communities.

Biological inventories conducted by Essex Region Conservation Authority (ERCA) in 2008, at the time of the last Purple Twayblade observations, describe the significance of remnant tallgrass prairie, meadow marsh, and Oak woodland habitat in the Park. A total of 524 plant species were documented, approximately one-third of all species known to be growing in Essex County outside of cultivation (ERCA 2008). A total of 122 plant species had significant conservation designations. Significant dragonfly (14 species), butterfly (16 species) and other wildlife species (six birds, reptiles and mammals) were also recorded at the time, making Tallgrass Prairie Heritage Park one of the highest diversity sites in the region.

Historical and current vegetation mapping were used to identify potentially suitable habitat for Purple Twayblade searches (Photo 6). These included areas of Black Oak woodland and forest, Pin Oak woodland and swamp, tallgrass prairie and meadow marsh.

In June 2022, the City of Windsor and volunteers from Friends of Ojibway Prairie and TgO conducted ground searches for Purple Twayblade, focusing on the east side of the Park. When a plant was discovered, the location was recorded (GPS) and described. All plants were counted and noted as flowering or not flowering. If a plant was browsed by wildlife, it was also noted.



Photo 6: Approximate targeted search area for Purple Twayblade in the Tallgrass Prairie Heritage Park area.

A total of 179 plants were recorded. Approximately 33% (59 plants) produced a flowering stalk. Of the 59 plants that produced a flowering stalk, 20% (12 plants) had stalks that were browsed and 80% (47 plants) had healthy stalks with approximately 5 to 25 flowers. Browsing was only noted to occur on the flowering stalks of plants, not the leaves. Follow-up surveys to confirm capsule production were

conducted at the end of June and again in mid-July 2022. Clusters of plants were revisited and the number of capsules produced per plant was recorded. At this time, there were many plants that had either been browsed or trampled upon, and most plants had empty stalks. Only 10 capsules were counted on plants in mid-July. There were only 1-2 seed capsules per plant. One plant had 4 seed capsules.

Purple Twayblade plants were most frequently associated with a groundcover of Pennsylvania Sedge (*Carex Pennsylvania*), Spotted Geranium (*Geranium maculatum*), American Hog-peanut (*Amphicarpaea bracteata*), Early Meadow-rue (*Thalictrum dioicum*), Wild Lily-of-the-valley (*Maianthemum canadense*) and a variety of native ferns. The sub-canopy and canopy were relatively open with dappled light hitting the woodland floor. Oaks, especially Black Oak (*Quercus velutina*) and White Oak (*Quercus alba*), were the dominant species in the canopy. It was also noted that many plants were found growing on elevated knoll topography dominated by Pennsylvania Sedge. The type of terrain, composed of low dunal sandy knolls separated by broad swales, is found in several areas of the Ojibway Prairie Complex and is believed to be associated with the shoreline of glacial Lake Rouge.



Photo 7: Cluster of flowering and non-flowering Purple Twayblade plants in Oak woodland habitat. Common associates include Pennsylvania Sedge and Spotted Geranium, June 2022. Photo: Tallgrass Ontario.



Photo 8: Volunteers searching grassy knoll areas where Purple Twayblade was commonly found. Photo: Tallgrass Ontario.

Habitat Management and Protection

A prescribed burn was conducted in spring 2022 in approximately 2.5 hectares (ha) of Oak woodland habitat that supports Purple Twayblade. The objectives of the burn were two-fold: control invasive species and invigorate the native plant understory. The prescribed burn was conducted when Purple Twayblade and other sensitive plants and wildlife were still dormant or in hibernation, to avoid any unintended harm to individuals. The fire was successful in consuming much of the dead leaf litter and killed small shrubs that were establishing in the understory. The lack of leaf litter made for much easier visual observations of Purple Twayblade later that spring. No imminent threats to the species were recorded during field surveys; however, it was noted that the quality of the Purple Twayblade habitat was very high, most likely due to the history of routine prescribed burns that the City has undertaken in that particular location. If this level of management was to cease, natural succession and resulting competition could have a negative impact the Purple Twayblade population.

Awareness and Knowledge Sharing



Photo 9: Prescribed burn conducted in Tallgrass Prairie Heritage Park, March 2022.

In order to help raise awareness of Purple Twayblade and sensitive tallgrass ecosystems, TgO and the City of Windsor are creating a species at risk educational pamphlet which highlights the threats to Purple Twayblade and the important measures that can be taken to help mitigate those threats. This information will be distributed to the public and made available to other stewardship organizations. We are also working with a talented environmental artist, Mariah Alexander, from the Walpole Island Heritage Centre to include artwork and traditional ecological knowledge of Purple Twayblade into the pamphlet.



Our lives could not be if not for the lives of the plants and animals. As our food, medicine, clothing, shelter, tools, and inspiration, they give themselves. "In their giving, their lives are also ensured in a chain of reciprocity" (Kimmerer, 2013). We have responsibilities to the plants and animals. To learn their names, notice them, spread their seeds, create habitat, and give them offerings. It is in these relationships we restore the environment and ourselves. ~ Mariah Alexander

Reference: Robin Wall Kimmerer, 2013. Braiding Sweetgrass.

Upcoming Survey Work

Additional Purple Twayblade surveys were initiated in June 2023 throughout the west side of Tallgrass Prairie Heritage Park. Another 69 plants were discovered, a majority of which were flowering. The habitat included tallgrass prairie, Black Oak woodland, and the edges of Pin Oak swamp. Although the habitat is considered remnant quality, invasive European Reed (*Phragmites australis* ssp. *australis*) was found growing nearby, and leaf litter accumulation was significant in areas. Follow-up searches for additional plants and seed capsules will be completed in summer 2023. Future prescribed burns and invasive species removal could help benefit Purple Twayblade in these newly identified areas.



Tgo would like to thank the City of Windsor and Friends of Ojibway Prairie for their efforts and expertise in undertaking the project activities. Tgo would also like to thank the MECP for providing funding for this important project. We are grateful to assist MECP in measuring their progress towards achieving the objectives in the Purple Twayblade Recovery Strategy and Government Response Statement.

For more information on Tallgrass Prairie Heritage Park and Purple Twayblade visit these online resources:

- [Visit Tallgrass Prairie Heritage Park](#)
- [Purple Twayblade Government Response Statement](#)
- [Purple Twayblade Recovery Strategy](#)

References

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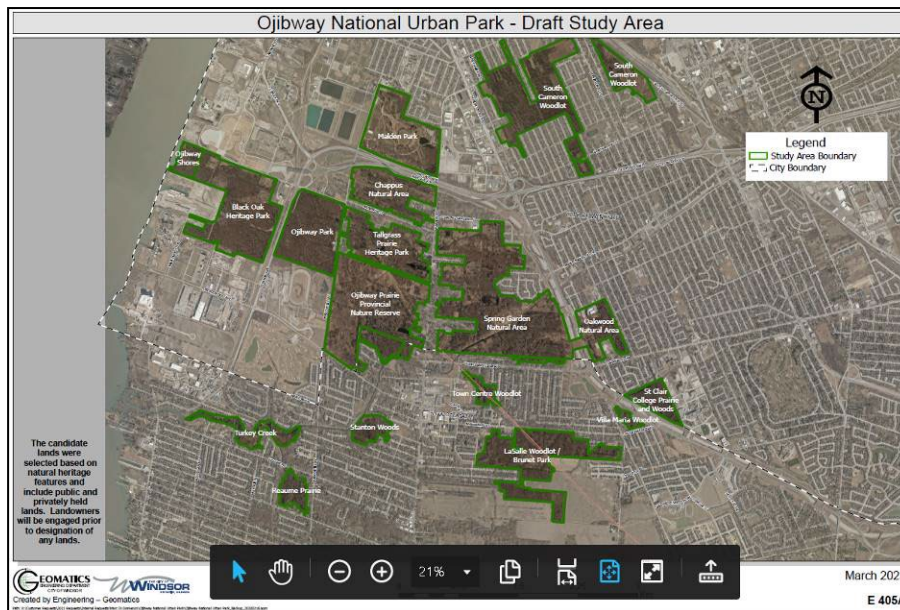
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A National Urban Park in Windsor, Ontario

Have you heard that Parks Canada has launched a new program to create a network of National Urban Parks across Canada? This exciting new initiative aims to support access to nature for people living in major urban centres. Although each National Urban Park will be unique, all will be created with a shared vision of conserving nature, connecting people with nature, and advancing reconciliation with Indigenous peoples.

Since the collaboration agreement was signed in August 2021, the City of Windsor has been working together with Parks Canada, Town of LaSalle, and numerous partners (Walpole Island First Nation, Caldwell First Nation, Ontario Parks, Ministry of Transportation Ontario, Hydro One) in exploring a National Urban Park centred on the Ojibway Prairie Complex. To date, the pre-feasibility stage of Park development has been completed, including natural and cultural heritage research, partner and stakeholder engagement, and public consultation. Now the planning phase has begun, where the Park boundary will be finalized and financial, operational, and governance considerations will be made.

Tallgrass Ontario is honoured to be a stakeholder in the National Urban Park consultation process. If you are interested in learning more about the Ojibway National Urban Park and taking part in public open house and drop-in events, visit the [City of Windsor’s National Urban Park website](#) to get the latest news on the planning process and future events.



The proposed National Urban Park will encompass hundreds of hectares of tallgrass prairie, savannah and woodland, forest, and sensitive wetland habitats. Protecting these areas will also protect the significant natural and cultural heritage features found only in southwestern Ontario.

Native Plant Notes: Ohio Spiderwort (*Tradescantia ohioensis*)

Tradescantia ohioensis, also called Ohio Spiderwort, is a clump-forming herbaceous perennial plant. It can grow up to 3 feet tall with dark bluish green, arching, grass-like leaves up to 15 inches long and 1 inch wide. The leaves wrap around the stem in sheaths and are folded lengthwise forming a channel or groove. Clusters of light violet to blue violet, three-petaled flowers bloom at the top of stems from May into early July. The flowers open during the morning and close by the afternoon. Each flower opens for only one day. Only a few flowers are in bloom at the same time. The mature seed capsules split into 3 sections, each capsule releasing 3-6 oval to oblong, brown seeds.



Ohio Spiderwort in Windsor, ON. The species was first collected in Norfolk County by J.M. Macoun, Canadian explorer and naturalist, in 1901. Ohio Spiderwort photos by William McIlveen.

Ohio Spiderwort is considered provincially and nationally rare (S2/N2: Imperiled - At high risk of extirpation due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors). It is restricted to remnant tallgrass prairies, oak savannahs, and open woodlands in southwestern Ontario. It is currently known only from Walpole Island First Nation (Lambton County) and the Windsor area (Essex County). It is considered a [tallgrass prairie indicator species](#) and an important nectar source for native bumblebees. Other bees, flies and butterflies visit the flowers as well. Deer and rabbits are known to browse on the stems.

Native Plant Resources Guide: North American Native Plant Society

If you are interested in adding native plants to your landscape or restoring a native habitat such as tallgrass prairie or meadow, check out the educational resources available from the [North American Native Plant Society](#). From their online native plant database to instructions on how to collect and store native seed, it is a great website to explore and learn more about individual species, their habitats, and growing requirements. Check out their [Regional Native Plant Growers List](#) and [Seed Exchange](#) to see what is available in your area!



ARE YOU PASSIONATE ABOUT PRAIRIES?**TALLGRASS ONTARIO IS LOOKING FOR DEDICATED INDIVIDUALS
TO JOIN OUR BOARD OF DIRECTORS**

Tallgrass communities, including prairies and savannas, are some of the most endangered ecosystems in Canada. For over 20 years, TgO has worked diligently to build relationships between conservation groups and individuals engaged in tallgrass recovery efforts. Through our successful, scientific-based grant efforts and community partnerships, we have facilitated tallgrass restoration and maintenance projects across hundreds of hectares in southern Ontario, raising public awareness about the rarity of these ecosystems and their importance to Canadian natural heritage.

If you would like to share in our mission and shape the strategic direction of TgO, please contact us with your resume and/or short biography at: info@tallgrassontario.org

We look forward to discussing the many exciting opportunities on our Board of Directors.

Sincerely,
Season Snyder, TgO President

The Bluestem Banner is published twice per year by Tallgrass Ontario. The next edition will appear in December 2023. All previous editions of the Bluestem Banner can be found here:

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