

Final Report on “Great Plains Ladies’-tresses (*Spiranthes magnicamporum*): Establishment of Annual Monitoring Protocol to Determine Effectiveness of Conservation Land Management”

June 2019

Introduction

Great Plains Ladies’-tresses (*Spiranthes magnicamporum*) (GPLT) is a species of concern, listed provincially as Endangered under the Manitoba’s Endangered Species and Ecosystems Act (Manitoba Conservation Wildlife and Ecosystem Protection Branch Undated) and globally Vulnerable (G3G4) by NatureServe (Natureserve 2017). Canadian occurrences are limited to Manitoba and Ontario, with Manitoba’s populations being the most northern sites for the species in North America. It is widespread across the Manitoba Tall Grass Prairie Preserve (MTGPP) south of Winnipeg, Manitoba (Figure 1), with the majority of mapped occurrences along roadways and road allowances. Plants grow to 15-30 cm (Ames et al., 2005), and are often difficult to detect, especially beneath thick vegetation. It is a late-blooming orchid with small white flowers arranged in a spike and is easily confused with the more common hooded ladies’ tresses (*Spiranthes romanzoffiana*). Populations of GPLT are known to experience large and unexplained annual fluctuations in abundance (Manitoba Conservation Wildlife and Ecosystem Protection Branch Undated). Threats to the species include encroachment of woody species, illegal collection of plants, spraying of herbicides, clearing of ditches, weedy species invasion, forest succession, soil disturbance or compaction, loss of habitat to agriculture and incompatible grazing.

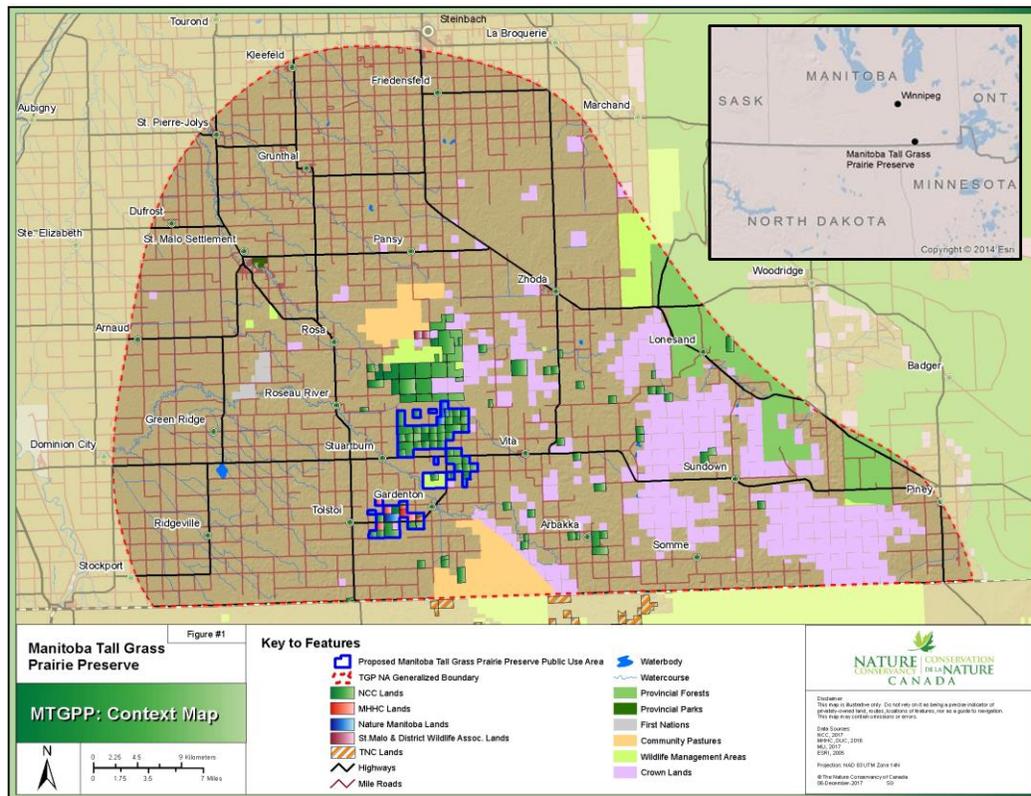


Figure 1: Manitoba Tall Grass Prairie Preserve, located in southeastern Manitoba.

The Nature Conservancy of Canada (NCC) owns and manages a portion of the GPLT habitat in Canada within the MTGPP. In addition to NCC, preserve partners include Manitoba Habitat Heritage Corporation, Nature Manitoba, Environment Canada, and Manitoba Sustainable Development. NCC and MTGPP partners manage Preserve lands using prescribed fire, haying, and grazing. Wildfires regularly occur as well. To date there has been little to no research on the impacts and effects of land management practices on GPLT, and the implications for their conservation. A key component of recovery efforts includes protection of critical habitat for this species. NCC is interested in determining how existing land management strategies (including prescribed burning, haying, grazing, etc.) may be influencing the MTGPP population of GPLT. The results of this research project will help guide NCC and MTGPP partners by informing land management strategies to conserve GPLT orchids on NCC lands and to improve habitat for this species.

The four objectives of this project are to:

1. Examine the relationship between GPLT and land management.
2. Test the effectiveness of monitoring protocols for Great Plains Ladies'-tresses at the MTGPP for the purpose of implementation as long-term annual monitoring within established permanent plots.
3. Identify and recommend beneficial management practices for GPLT at the MTGPP.
4. Share research results effectively with the orchid conservation community, broader scientific community, land managers, MTGPP visitors, and the general public.

Activities Carried out in 2018

1. Population surveys

In September 2018, NCC conducted surveys on GPLT populations to: 1) ground truth potential locations for permanent sampling plots; and 2) survey locations where previous GPLT observations were previously only mapped at a very coarse scale (e.g. an entire quarter section of land) to determine more precise locations of plants. Surveys were targeted in areas that were determined to have confirmed GPLT observations from previous years. NCC staff worked together with one of NCC's partners in the Manitoba Tall Grass Prairie Preserve (MTGPP), as well as two volunteer orchid experts to survey 10 locations, including ditches and MTGPP conservation lands. Surveys were carried out over the course of 4 days: September 5, 6, 8, and 10, 2019.

Great Plains Ladies'-tresses were found in 3 of the 10 survey locations, and of those 2 were along ditches (Table 1). We did not find any flowering orchid stems in areas of proposed permanent monitoring plots. Although it is not entirely clear why flowering stem production was so low, it is suspected that this may be linked to extremely dry conditions experienced over the summer and fall of 2018.

Table 1: 2018 GPLT survey results

Property Surveyed	Date	Number of Surveyors	Number of GPLT Flowering Stems
Pajonk – SE corner of property	09/05/2018	3	0
Pajonk – ditch along E side of property	09/05/2018	2	9
Smook 2 – NW quarter section	09/05/2018	2	0
Smook 2 – NE quarter section	09/05/2018	2	0
Nickel	09/05/2018 09/06/2018	2	0
Bott	09/06/2018	2	2
Privately owned - ditch along south edge of quarter section	09/06/2018	2	26
Privately owned - ditch along north edge of quarter section	09/06/2018	2	0
Tencha	09/06/2018	2	0
Singh	09/08/2018 09/10/2018	2	0

2. Field-testing monitoring protocol

In September 2018, field testing of previously developed protocols was carried out in a single site. Initially, NCC had planned to set up permanent monitoring plots at all 20 proposed locations (using 2018 flowering stem observations as a guide) and implement the monitoring protocols at each of these. However, given that population surveys failed to locate orchid plants, we chose to field-test the protocols at one site. This field testing resulted in some required changes to the protocol, which have been inserted into the previously developed document (see attached). Some of the adaptations include, but are not limited to:

- Decreased size of each survey grid square from 50 x 50 m to 20 x 20 m.
- Addition of detailed step by step field methods for surveying grid squares and collecting data.
- Inclusion of decision points to trigger the decision to not monitor a given grid square.
- Addition of local weather data to future analyses to test for impacts of climate on GPLT abundance.

In addition, locations for all 20 permanent monitoring plots were determined and subsequently mapped using GIS locations of flowering stem observations provided by the Manitoba Conservation Data Centre, combined with mapped patches of suitable habitat to determine plot placement. Then, a sampling grid containing a series 20 x 20 m squares was placed over the area (see Figure 2). Sampling grids were further refined by selecting squares that occur within 20 m of a mapped GPLT occurrence. The sampling grids contain a larger number of grid squares than will be surveyed, and the methodologies for sub-sampling grid squares are yet to be determined. These grid squares within each sampling plot location will be used for 2019 field surveys, following the newly adapted protocols.

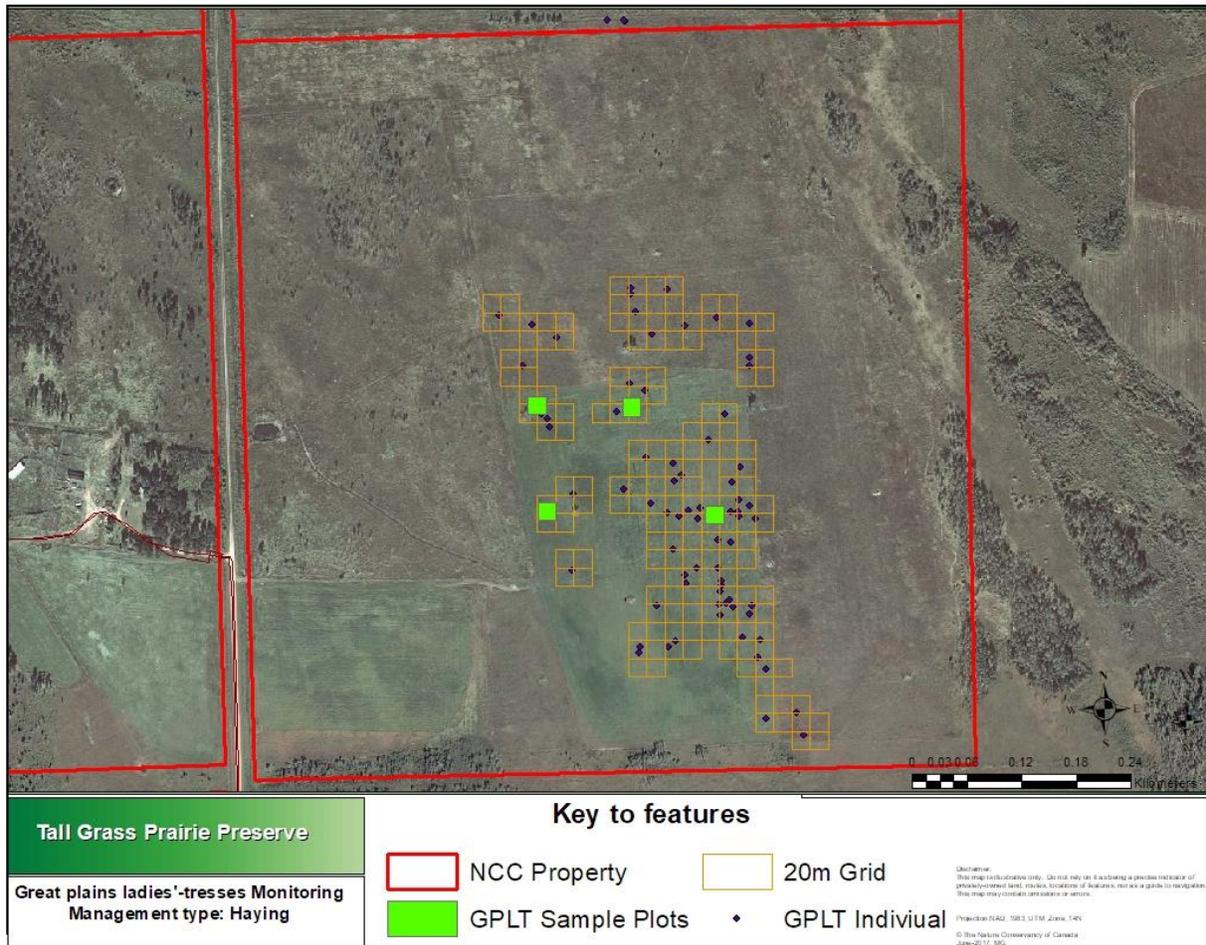


Figure 2: 20 x 20 m Sampling grids at four Great Plains Ladies'-tresses permanent monitoring plots, under haying management, at the Manitoba Tall Grass Prairie Preserve.

3. Communications

NCC has also been sharing our work on GPLT with the public as well as the scientific and conservation communities, recognizing the generous support provided by the San Diego County Orchid Society.

- Blog Post: A blog post has been developed by an NCC intern about her experiences surveying for GPLT in the fall of 2018. The post will be published on NCC's Land Lines blog website (<http://www.natureconservancy.ca/en/blog/>).
- Prairie Conservation and Endangered Species Conference: The conference was held in Winnipeg, MB, in February 2019. The 3 day event was attended by approximately 330 people, and is a forum held every 3 years to discuss the latest issues, information, research and trends in the conservation of prairie landscapes, species, and species at risk. NCC gave a presentation entitled "Species At Risk Monitoring and Management in Manitoba Tall-grass Prairie: Lessons Learned", which included a summary of work done to date on this project.

Project Budget

Expenditure Type	Allocation of Society Funds
Population surveys, field test monitoring methods	3871.00
Establish permanent plots for future long-term monitoring (data analysis, compiling results, planning for 2019, reporting)	1494.00
Project communications	704.53
Total	6076.53 CAD

Next steps

- 2019 field surveys and adoption of newly amended methods at all 20 proposed sampling plots.
- Further engage volunteers to survey sites where GPLT observations are mapped at a coarse scale.
- Data analysis, once at least 3 years of data have been collected.
- Nature Conservancy of Canada will continue to communicate about this project as we move forward and collect enough data to start carrying out analyses. In addition, upon the completion of the 2019 field season, we will deliver a presentation and update on the project to the Manitoba Tall Grass Prairie Preserve Management Committee, and continue to plan for an interpretive panel at NCC's Weston Family Tall Grass Prairie Preserve Interpretive Centre or at one of three MTGPP interpretive trails.

References

Ames, D., Acheson, P.B., Heshka, L., Joyce, B., Neufeld, J., Reeves, R., Reimer, E., and Ward, I. 2005. Orchids of Manitoba: a field guide. Winnipeg, Manitoba: Native Orchid Conservation Inc.

Manitoba Conservation Wildlife and Ecosystem Protection Branch. Undated. Manitoba's Species At Risk – Great Plains ladies'-tresses *Spiranthes magnicamporum* (Fact Sheet). Retrieved from https://www.gov.mb.ca/sd/wildlife/sar/pdf/gp_ladies_tresses.pdf

Natureserve. 2017. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.0. NatureServe, Arlington, VA. U.S.A. Available <http://explorer.natureserve.org>. (Accessed: August 22, 2017)